NIKI WIND POWER SINGLE MEMBER P.C.

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SPECIAL ECOLOGICAL ASSESSMENT FOR THE PROTECTED FEATURES OF THE SPECIAL PROTECTION AREA WITH CODE GR1110010 AND NAME “OREINOS EVROS - KOILADA DEREIOU” AND IMPORTANT BIRD AREA OF GREECE NAMED “DADIA- DEREIO – AISYMI FOREST” WITH CODE GR003

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PROJECT RESEARCH TEAM

Name	Occupation	Object of Study
Psachoula Aikaterini	Forester - Environmental Scientist, M.Sc	Development of methodology for recordings, coordination of fieldwork, field recordings, evaluation, and synthesis of results, and drafting of the final study.
Psarikidis Athanasios	Forester - Environmental Scientist, M.Sc. Sustainable Management of Environment and Natural Resources	Development of methodology for recordings, coordination of fieldwork, field recordings, evaluation, and synthesis of results, and drafting of the final study.
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Environmental Consultant of the Project

Psachoula Aikaterini	Forester - Environmental Scientist, M.Sc

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1. Introduction

This Special Environmental Assessment (SEA) is prepared for the protected elements of the Special Protection Area (SPA) with the code GR1110010 and the name 'Mount Evros - Deriou Valley' and the Important Bird Areas of Greece (I.B.A.) with the code GR003 and the name 'Dadia - Dereio - Aisymi Forest', within the framework of the Environmental Impact Study for the wind farm development project of the company Niki Wind Power Single Member P.C. The wind power plant has a nominal capacity of 34.50 MW, located at "PYRAMIS VRACHOU", in the Municipality of Soufli, in the Regional Unit of Evros and is classified in Category A2 of the 10^{th} Group with s/n 1, and type of project: Electricity generation from wind energy, on the basis of the contract No. ΥΠΕΝ/ΔΙΠΑ/63951/4418/2024 Amendment and codification of the Decree under reference ΔΙΠΑ/*οικ*. 37674/27-7-2016 ministerial decision "Amendment and codification of ministerial decision 1958/2012 - Classification of public and private projects and activities in categories and subcategories according to paragraph 4 of article 1 of Law 4014/21.9.2011 (A' 209), as amended and in force".

The present study is carried out in accordance with the specifications resulting from Ministerial Decision Ref. No. 170225: "Specification of the contents of environmental licensing folders for Category A projects according to the decision of the Minister of Environment, Energy, and Climate Change with number 1958/2012 (Government Gazette 21) as amended, according to Article 11 of Law 4014/2011 (Government Gazette 209A), as well as any other relevant detail" (Government Gazette 135/B/27-01-2014). According to Article 13 of Law 4296/2014 (Government Gazette 214/A/02-10-2014), there is a need for the preparation of a Special Ecological Study even for the non-protected areas (special protection areas) for birdlife but have areas with name "Important Bird Areas". This is based on the following provision: "Article thirteen Obligation to prepare a special ornithological study for areas located outside Special Protection Areas for birdlife but characterized as Important Bird Areas. Paragraph 3 of Article 6 of the Joint Ministerial

Decision No. 49828/12.11.2008, issued by the Ministers of Environment, Spatial Planning and Public Works, Internal Affairs, Economy and Finance, Development, Rural Development and Food, Culture, Tourism Development, Transport and Communications, Merchant Marine, Aegean, and Insular Policy (Government Gazette 2464/B) is replaced as follows: "3.Wind plant installations within the Special Protection Areas (SPA) for birdlife and Important Bird Areas (IBA) of Directive 79/409/EEC can be performed according to Article 10 of Law 4014/2011, following the required Special Ecological Assessment (SEA), and based on the relevant provisions of Ministerial Decision econ. 170225/2014 (Government Gazette 135/B) and Ministerial Decision 52983/1952/2013 (Government Gazette 2436/B) for Category A and Category B projects of Law 4014/2011, respectively. The specific requirements and limitations for the implementation of the above wind installations are determined in the respective decision approving the environmental terms for Category A projects of Law 4014/2011, or in the decision approving the Special Ecological Assessment for Category B projects of the same law".

The entire project (boundaries of the production license polygon of the wind power plant, based on special protocol RAEWW ΑΔ - 08732 production license) is located within the Special Protection Area (SPA) with code GR1110010 and name "Oreinos Evros - Koilada Dereiou", as well as within the Important Bird Area (IBA) of Greece with code GR003 and name "Dasos Dadia- Dereio – Aisymi".

The study group of the present Special Ecological Assessment, has chosen to examine and evaluate the potential impacts of the project on the protected elements of the following protected areas:

- The area with code GR1110010, designated as a Special Protection Area (SPA), covers an area of 48,907.49 hectares (Government Gazette 4432/B/15-12-2017).
- The area with code GR003, designated as an Important Bird Area (IBA) of Greece, covering an area of 28,873 hectares (source: https://www.ornithologiki.gr/el/oi-draseis-mas/diatirisi-erevna/simantikes-perioxes-gia-ta-poulia-tis-elladas/xartis-perioxon/GR003).

Additionally, the study team of this SEA has chosen to examine and evaluate the potential impacts of the project on the protected elements of the following neighboring areas of the Natura 2000 network, which are designated as Special Protection Areas:

- The area with code GR1130011, named "Koilada Filiouri", designated as a Special Protection Area (SPA), covers an area of 37,565.9 hectares (Government Gazette 4432/B/15-12-2017). This specific protected area of the Natura 2000 network is located west of the project installation area, at an average distance (straight line) greater than 8 kilometers.
- The area with code GR1110002, named "Dasos Dadias - Soufli," designated as a Special Protection Area (SPA), covering an area of 41,111.58 hectares (Government Gazette 4432/B/15-12-2017). This specific protected area of

the Natura 2000 network is located southeast of the project installation area, at an average distance (straight line) of approximately 20 kilometers.

- The area with code BG0002019, named "Byala reka," designated as a Special Protection Area (SPA), covering an area of 44,626.6460 hectares (https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=BG0002019). This specific protected area of the Natura 2000 network is located north of the project installation area, at an average distance (straight line) of less than 100 meters.

The aforementioned protected areas of the Natura 2000 network, harbor species of avifauna (raptors - scavenger species), which, according to their ecology, are known to operate within a large radius capable of covering the distance to the area under study for this project.

Finally, the study team of this SEA also selected the nearest Important Bird Area (IBA) of Greece with code GR008 and the name "Koilada Filouri and Eastern Rhodope," covering an area of 82,529.2 hectares. (https://www.ornithologiki.gr/el/oi-draseis-mas/diatirisi-erevna/simantikes-perioxes-gia-ta-poulia-tis-elladas/xartis-perioxon/GR008).

The WPP under consideration at the location "PYRAMIS VRACHOU" is suggested to be installed in the Municipality of Soufli, in the Regional Unit of Evros, by the company Niki Wind Power Single Member P.C., at an average distance (in a straight line) greater than 50 kilometers north of the city of Alexandroupolis. The project has obtained production license and includes 10 wind turbines with a total installed capacity of 34.5 MW (each turbine has an individual capacity of 3.45 MW). The turbines are of type VESTAS V117 - 3.45, with a rotor diameter of 117 meters and a hub height of 91.50 meters.

The coordinates of the polygons defining the project area (boundaries of the installation site of the electricity production station, according to the special reference number PAE ΑΔ - 08732 production license), as requested by the company to the Regulatory Authority for Energy, Waste and Water (RAEWW) in a geodetic reference system ΕΓΣΑ'87, are depicted in Table 1 below.

COORDINATES IN ΕΓΣΑ'87					
AA	**X**	**Y**	**AA**	**X**	**Y**
1	660203	4574597	**12**	662522	4575655
2	660151	4574667	**13**	662209	4575648
3	660592	4574994	**14**	661941	4575615
4	660961	4574989	**15**	661792	4575478
5	661382	4575151	**16**	661990	4575266
6	661607	4575488	**17**	661931	4575179
7	661869	4575716	**18**	661653	4575323
8	662231	4575776	**19**	661520	4575064
9	662598	4575768	**20**	660962	4574854
10	662939	4575724	**21**	660602	4574875
11	662938	4575620			

Table 1: Coordinates of the vertices of the polygons of the wind power plant with production license at Pyramis Vrachos, based on the request to the Regulatory Authority for Energy (RAE)

2. Study implementation plan

Based on Law 4014/2011 and its references in Article 11, specifically paragraphs 9 and 10 thereof:

"9. The Special Ecological Assessment for Category A projects and activities is included as an annex to the Environmental Impact Study (EIS), as an integral part thereof, presenting, in addition to what is provided for in Article 10 of this law: a) detailed recording of natural environment elements with an emphasis on protected objects of Natura areas as referred to in paragraph 6 of Article 9 of Law 3937/2011 (Government Gazette 60/A/2011), which may be affected by the project or activity, and b) proper impact assessment, according to paragraph 10 of this article.

10. The proper impact assessment should include analysis and evaluation of the estimated impacts with qualitative and quantitative data on:

a) Habitat types of Annex I of Ministerial Decision Our Ref.14849/853/E103/4.4.2008 (B' 645), especially regarding their representativeness, relative area, and conservation status,

b) Species of flora and fauna of Annex II of Ministerial Decision Our Ref.14849/853/E103/4.4.2008 (B' 645), especially regarding population size and density, conservation status, and isolation,

c) Bird species of Annex I of Ministerial Decision Our Ref.37338/1807/E.103 (B' 1495), as well as other migratory bird species with significant presence in the Natura 2000 area, especially regarding population size and density, conservation status, and isolation,

d) Qualitative and quantitative data as far as it concerns the preservation of the environment.

In case of estimating potential significant negative impacts, necessary measures for prevention and minimization recorded with corresponding documentation to ensure the preservation of the area.

In the event that it is not possible to ensure the integrity of the site, the necessary measures for the preclusion of the negative effects shall be listed and documented in accordance with the provisions of Article 10 of the present law".

In the present study, the relevant data on the avifauna examined of the areas in the SPAs GR1110010, GR1130011, GR1110002 and BG0001032, as well as the relevant data on the avifauna of the SPAs GR003 and GR008. The compilation of this study conducted based on the relevant provisions of Law 4014/2011. Additionally, it adhered to the specific requirements for Environmental Impact Assessments (EIAs) according to Ministerial Decision Α.Π. Number 170225 (Joint Ministerial Decision 135/B/27-01-2014). It also took into account the stipulations of Article 6 of Directive 92/43 and Article 5 of Joint Ministerial Decision Our Ref. 37338/1807/E.103 (Government Gazette 1495/B/06-09-

2010) concerning the conservation of wild bird species and habitats, in compliance with Council Directive 79/409/EEC "on the conservation of wild birds" of the European Council of April 2, 1979, as codified by Directive 2009/147/EC, as amended, supplemented, and in force to date, according to Ministerial Decision Η.Π. 8353/276/E103 (Government Gazette 415/B/23-02-2012) "Amendment and supplementation of Ministerial Decision No. 37338/1807/2010 'Determination of measures and procedures for the conservation of wild bird species and habitats/habitat types, in accordance with Directive 79/409/EEC....'" (Government Gazette B' 1495), in accordance with the provisions of the first paragraph of Article 4(1) of Directive 79/409/EEC "On the conservation of wild birds" of the European Council of April 2, 1979, as codified by Directive 2009/147/EC.".

The above project, as previously mentioned, is classified in Category A2 of the 10th Group with code 1, and its type is: Wind Energy Production, based on the modification and codification of Ministerial Decision ΥΠΕΝ/ΔΙΠΑ/63951/4418/2024 Amendment and codification of the directive referred to in point ΔΙΠΑ/37674/27-7-2016 Ministerial Decision "Amendment and codification of Ministerial Decision 1958/2012 – Classification of public and private projects and activities into categories and subcategories according to paragraph 4 of Article 1 of Law 4014/21.9.2011 (A'209), as amended and in force (B'2471) (Government Gazette 841/B/24-02-2022), and in accordance with Appendix 3.2: The specifications of the Special Ecological Assessment (SEA) according to Ministerial Decision 170225 (Government Gazette 135/B/27-01-2014) state that the fieldwork should be conducted over a period of 10 to 30 days, depending on the season of the year (according to the seasonal presence of species and habitat types listed in Directive 92/43/EEC for which the area has been designated). This fieldwork should be based on the documented judgment of the SEA researcher and should relate with existing data sources from reliable sources (e.g., Standard Data Sheet of the relevant Natura 2000 area, mapping of habitat types of Community interest provided by the competent authorities, Special Environmental Study of the relevant Natura 2000 area, etc.). Furthermore, for corresponding projects, the fieldwork must include at least the following: "observations of bird species during the period from March to June, depending on the seasonal presence of species in each area, which will be combined with existing data sources, e.g., other ornithological studies, research, and data." The study team preferred that the collection of specialized ornithological data not be limited in duration but cover, in terms of the number of days, the ecological requirements of an annual cycle of bird species, covering both the breeding period (March to June for most species) and the spring and autumn migration period, as well as the wintering period.

In total, 28 fieldwork days were conducted to achieve the observation program described above. More specifically, visits for observations were conducted by two observers from the team for two days in July 2020, two days in August 2020, two days in September 2020, two days in October 2020, two days in November 2020, two days in December 2020, two days in January 2021, two days in February 2021, three days in March 2021, three days in April 2021, three days in May 2021 and three days in June 2021. During the aforementioned field days, all fieldwork completed related to bird recording (both diurnal and nocturnal as well as supplementary work concerning other fauna). The above field days also include hours spent observing behavior and identifying potential nesting sites of birds of prey, as well as critical habitats, by the study team members.

The present Special Ecological Assessment, considering the entirety of the aforementioned legislative framework, includes:

- Introductory information concerning the proposed project in the study area.
- Description of the study design implementation plan.
- Institutional framework regarding relevant legislation for the necessity of Renewable Energy Sources (RES), nature protection, and environmental licensing of RES projects.
- Literature review in Greek and foreign literature regarding the types of impacts of wind power plants on avifauna.
- Preliminary impact assessment including the determination and description of the study area and field research area, identification of species of interest from existing information analysis for the area (literature data), description of the protective object of the study area, conservation goals, etc., with literature review and data collection for the area regarding avifauna (Standard data sheets, distribution maps, other bibliographic sources), and finally, the completion of a preliminary impact assessment.
- Definition of the methodology concerning field recordings based on a combination of internationally accepted methods, per bird group, and additionally for other fauna species, and organization of sampling sites per bird group (and additionally for other fauna species), according to ecological requirements and suitability of habitats, determination of the timing of measurements, compilation of recording protocols per bird group (and additionally for other fauna species), and determination of data analysis methodology.
- Methodology and framework for impact assessment, with estimation and evaluation of the potential impacts of the proposed wind power plant installation on selected, due to significance, bird species and additionally on fauna species, considering parameters such as: the ecological sensitivity of species, sensitivity to impacts from wind farm siting, the estimated magnitude of each impact (based on presence patterns, abundance, and movements of the species in the field investigation area such as field recordings - spatial distribution, height and behavior of movements, critical nesting, roosting, and feeding habitats, the spatial extent of the impact on species and their habitats, the population that may be affected, the duration and repeatability of the impact, etc.), as well as the assessment of synergistic impacts both in the wider study area and in the vicinity of the studied wind power plant installation, mainly for species with large endemic areas such as raptors.
- Analysis and evaluation of the necessary impact assessment through field recording analysis, analysis of recordings of significant species (SPA

designation species and other significant bird species), assessment of impact significance, potential impacts from collisions, impacts from disturbance - deterrents, impacts from direct loss of habitats, synergistic-cumulative impacts at the study area level, as well as supplementary analysis and evaluation of the required impact assessment of other fauna species.

- Comprehensive Assessment of Required Estimation - Summary of Conclusions and Proposed Mitigation Measures.
- Proposal for monitoring avifauna and, optionally, other wildlife during the operational phase.

All of the aforementioned has been broken down into sections and subsections in such a way as to include all of the above information and to be consistent with the sections of the required SEA (to include all sections required therein).

3. Institutional framework

This section summarises the institutional framework of the relevant legislation on the need for RES as a necessary component for the implementation of an integrated and rational climate change mitigation, nature protection and environmental licensing of RES projects. First presented in this section is a brief bibliographic review of the impacts of climate change on wildlife.

Impacts of climate change on wildlife

Global warming observed in recent decades has affected biological systems in several ways (Walther et al. 2002). Climate change causes significant shifts in species distributions and abundance patterns, and understanding these displacements poses a significant challenge for conservation biology (Heller and Zavaleta 2009, Parmesan 2006, Stephens et al. 2016, Bagchi et al. 2018). One of the most apparent outcomes is the changes in phenology and the timing and duration of the phases of the annual cycle in various animals and plants (Crick et al. 1997, Brown et al. 1999, Parmesan and Yohe 2003, Parmesan 2006). For instance, the duration and occurrence of plant flowering, breeding and animal migration are some of the phases of the annual cycle that are known to be affected and altered because of the response to increased temperatures (Crick et al. 1997; Parmesan 2007; Charmantier and Gienapp 2014; Thackeray et al. 2016).

However, while some organisms exhibit very simple annual cycles with only one transition between reproduction and non-reproduction, others have much more complex cycles (Jacobs and Wingfield 2000, Wingfield 2008). For example, many birds and mammals migrate, change feathers/fur, enter hibernation/estivation/diapause. These additional stages of the annual cycle have also been reported to shift temporally due to climate change (Both and te Marvelde 2007, Ozgul et al. 2010, Charmantier and Gienapp 2014, Morrison et al. 2015, Zimova et al. 2016). However, all these stages (including reproduction) are not necessarily affected in the same way by temperature changes (Serreze and Francis 2006, Visser et al. 2006, Visser 2008, Both et al. 2009). Furthermore, given that temperatures do not change at the same rate over time or space (Easterling et al. 1997, Vose et al. 2005, Serreze and Francis 2006, Stocker et al. 2013), it is likely that within the same population, different parts of the annual cycle also change at different rates in response to uneven temperature increases (Crozier et al. 2008). Climate change unevenly affects the annual stages of the bird (Van der Jeugd et al. 2009, Eichhorn et al. 2010, Valtonen et al. 2016) and mammal species (Ozgul et al. 2010, Moyes et al. 2011) cycles. Such shifts can lead to positive or negative impacts that may depend on the sex or phenological stage even within the same species.

Considerable concern arises from the possibility that areas currently significant for supporting species under special protection may not be suitable in terms of climate conditions for these species in the future (Araujo et al. 2004, Hannah et al. 2007, Bagchi et al. 2018). There is increasing evidence that although many individual locations will undergo significant changes in species composition due to climate change, suitable climate for most species will continue to exist (Hole et al. 2009, Araujo et al. 2011, Bagchi et al. 2013). However, there is a high probability that in many cases, the location of suitable climate will shift to other areas outside those where the species currently occur (Hole et al. 2009, Araujo et al. 2011, Bagchi et al. 2013, Baker et al. 2015). Therefore, the continued effectiveness of networks of suitable areas for species conservation, for which they have been designated, will depend on the ability of these species to move between old and new suitable areas (Heller και Zavaleta 2009, Bagchi et al. 2013, Cushman et al. 2013).

In summary, the most significant changes that may occur in wildlife due to climate change are:

- Changes in the distribution and range of species, including local variations at different altitudes.
- Changes in the phenology of migration.
- Impact on demographic factors and unforeseen population changes on a case-by-case basis.

The most important endogenous and exogenous factors that can affect the ability of species to adapt to new climatic conditions are:

- ✓ Lack of phenotypic/genotypic adaptability, with species that cannot respond to adaptation being more vulnerable.
- ✓ Dispersal ability, with species with low dispersal unable to move to new suitable areas resulting from climate change, especially in cases of fragmented habitats.
- ✓ Ecological specialization, with species that generally follow generalized dietary patterns and exhibit greater flexibility in meeting their needs from essential natural resources (generalists), appearing to have a clear advantage in adapting to new climatic conditions compared to species that specialize in the above requirements (specialists).
- ✓ Species with small population sizes will be more vulnerable.

- ✓ The increase in extreme values of certain climatic variables, because of climate change, will have additional negative consequences on the populations of vulnerable species.
- ✓ The intensity of indirect changes due to climate change in the quality of habitats directly linked to wildlife species.

According to Huntley et al. (2007), it is predicted that, on average, each European species will shift about 550 km northeastward by the end of our century, with a plethora of species being negatively impacted by climate change. According to the same authors, the species most likely to be threatened are those that are exclusively or almost exclusively distributed in Europe, species with very small current distributions, species living in Northern Europe today with no room for northward movement, and species with very little overlap between their current and estimated future distributions.

Necessity of RES and protection of Nature

As the impacts of climate change become increasingly evident, European countries are already beginning to design national strategies and implement corresponding adaptation plans to climate change. The global manifestations of climate change are becoming more apparent, as higher temperatures increase the risk of species extinction and the transmission of infectious diseases. The melting of ice caps affects sea levels, water supply, and increases the risk of flooding. Drought affects both human activities and ecosystems, while forced migration from the most affected areas intensifies the likelihood of conflicts and insecurity.

The European Council in March 2007 emphasized that to stabilize greenhouse gas concentrations in the atmosphere at levels that prevent dangerous anthropogenic interference with the climate system, the overall annual average temperature increase on the planet's surface should not exceed 2°C compared to pre-industrial levels. To achieve this, global greenhouse gas emissions need to be reduced by at least 50 % by 2050 compared to 1990 levels. Greenhouse gas emissions in the Community should continue to decrease even beyond 2020 as part of the Community's efforts to contribute to achieving this global emissions reduction target. The European Council of March 2007 decided that, until a global and comprehensive agreement for the post-2012 period is concluded, the Community undertakes a unilateral commitment to achieve a reduction of at least 20% in greenhouse gas emissions by 2020 compared to 1990 levels. Furthermore, the Council approved a target for the Community to reduce greenhouse gas emissions by 30% by 2020 compared to 1990 levels, in order to contribute to achieving a global and comprehensive agreement for the post-2012 period, provided that other developed countries commit to similar emission reductions and economically more advanced developing countries make appropriate contributions commensurate with their responsibilities and capabilities.

The European Council adopted a comprehensive approach to climate and energy policy aimed at combating climate change and increasing the EU's energy security. Among other measures, the requirements adopted by the heads of state and government included **ensuring that 20% of the EU's energy consumption comes from renewable sources**. In January 2008, the European Commission proposed binding legislation to implement the 20-20-20 targets. The known as "climate and energy commitment", agreed upon by the European Parliament and the Council in December 2008 and enacted into law in June 2009, includes legislation such as Directive 2009/28/EC "on the promotion of the use of energy from renewable sources." According to this directive, binding national targets aim for a 20% share of renewable energy in EU energy consumption to contribute to reducing the EU's dependency on energy imports and greenhouse gas emissions. The target for the share of energy from renewable sources in gross final energy consumption by 2020, according to the above, for Greece is 18%. However, according to Law 3851/2010 (Government Gazette 85/A/4.6.2010) titled "Acceleration of the Development of Renewable Energy Sources to Address Climate Change and other provisions under the competence of the Ministry of Environment, Energy and Climate Change," the national target for the participation of energy produced from RES in gross final energy consumption is increased from 18% to 20%. In Greece, promoting changes in energy production and management is also a priority due to the increased contribution of electricity generation to climate change, as 41% of CO_2 emissions come from lignite use in power generation (WWF 2009, 2013).

During the European Council meeting on October 23-24, 2014, the strategic framework for climate and energy until 2030 was agreed upon for the EU. The Council adopted conclusions, specifically outlining four significant objectives:

- ✓ Binding EU target to reduce greenhouse gas emissions by at least 40% by 2030 compared to 1990.
- ✓ **Binding EU target for at least a 27% share of renewable energy consumption by 2030.**
- ✓ Indicative EU target for improving energy efficiency by at least 27% by 2030.
- ✓ Support for the completion of the internal energy market by achieving the current target of electricity interconnection of 10% urgently and no later than 2020, especially in the Baltic and Iberian Peninsula countries, with a goal to achieve 15% by 2030.

According to the Ministry of Environment and Energy, the exploitation of the high potential of wind energy in our country, combined with the rapid development of technologies integrated into modern efficient wind turbines, is of immense importance for sustainable development, energy conservation, environmental protection, and addressing climate change (ypeka.gr/Default.aspx?tabid=287).

The halting of biodiversity loss is also a key priority of the EU. The pathway to achieving this goal is outlined in the European Commission's action plan titled "Our Life Insurance, Our Natural Capital: EU Biodiversity Strategy to 2020" (COM/2011/244, 3.5.2011). According to Specific Objective 1 of the annex referred to above, full implementation of the two directives related to the conservation of wild birds (79/409/EEC, which has been updated by Directive 2009/147/EC on the conservation of wild birds) and natural habitats and wild flora and fauna (92/43/EEC) is required.

The Habitats Directive 92/43/EEC (hereafter referred to as 2009/147/EC) complements the Birds Directive 79/409/EEC, together with which they are the most important directives transposed into national law concerning the protection of areas belonging to the Natura 2000 network and the protection of species and their habitats. According to the aforementioned European Directives, areas have been designated based on specific criteria that have significant natural characteristics worthy of protection. These areas are either Special Protection Areas (SPAs) or Sites of Community Importance (SCIs), which, according to Law 3937/2011 (Biodiversity Conservation and Other Provisions, Government Gazette 60/A/31.3.2011), are now designated as Special Areas of Conservation (SACs). In 2017, with Ministerial Decision 50743 (Government Gazette B' 4432/2017), the inclusion of new areas and the update of the national list of Natura 2000 sites were institutionalized as part of the project "Monitoring and assessment of the conservation status of species and habitat types of Community interest in Greece." This project was co-funded by the European Regional Development Fund (ERDF) under the Operational Program for the Environment and Sustainable Development (NSRF 2007-2013) and implemented by the Biodiversity and Protected Areas Department of the Ministry of Environment and Energy during the period 2014-2015, covering obligations arising from Directives 92/43/EEC and 2009/147/EC.

According to Article 6 of Directive 92/43/EEC:

"1. For the special areas of conservation, Member States shall establish the necessary conservation measures which may include, in particular, specific management plans or integrated into other planning schemes and appropriate regulatory, administrative, or contractual measures that correspond to the ecological requirements of the habitat types listed in Annex I and the species listed in Annex II found on the sites.

2. Member States shall establish appropriate measures to avoid deterioration of natural habitats and habitats of species in the special conservation areas, as well as disturbances affecting the species for which the zones have been designated, provided that such disturbances could have significant effects on the objectives of this Directive.

3. Any plan, not directly related or necessary for the management of the site, but which may significantly affect the site itself, either alone or in combination with other plans, shall be duly assessed for its impacts on the site, considering the conservation objectives. Based on the conclusions of the assessment of the impacts on the site, and excluding the provisions of paragraph 4, the competent national authorities shall agree on the relevant plan only after ensuring that it will not compromise the integrity of the site in question and, where necessary, after public opinion has been expressed.

4. If, despite the negative conclusions of the impact assessment and the absence of alternative solutions, a plan must be implemented for other imperative reasons of overriding public interest, including social or economic reasons, the Member State shall take all necessary compensatory measures to ensure the protection of the overall coherence of Natura 2000. The Member State informs the Commission about the compensatory measures it has taken.

When the site concerned is a site where a priority habitat type and/or a priority species are present, only arguments relating to human health and public safety or positive consequences of primary importance for the environment may be put forward, or, following an opinion from the Commission, other imperative reasons of overriding public interest."

From the above, it follows that the article in question is closely related to environmental permitting of plans and projects that may affect Natura 2000 areas by determining the relationship between nature conservation and land use, and by providing for the need to establish necessary conservation measures and regulatory, administrative, or contractual measures for the protection of protected objects (paragraph 1). It also addresses the avoidance of degradation of habitats and significant disturbance of species (paragraph 2) and establishes the framework for accepting the installation of a plan that may significantly affect these areas, prioritizing the integrity of the site but also mentioning cases of projects of significant public interest and the possibilities for addressing these cases (paragraphs 3 and 4).

The specific directive (92/43/EEC) and Article 6 have been incorporated into Greek law (Ministerial Decision 33318/3028/98, Government Gazette 1289/B/28.12.1998, and amended by Ministerial Decision 14849/853/E103/08, Government Gazette 645/B/11.4.2008), while there are also other provisions partly related to environmental permitting of projects and/or the conservation of biodiversity, containing information on the implementation of paragraphs 3 and 4 of Article 6 of the specific Directive.

Article 10 of Law 4014/11 (Government Gazette 209 A/21-9-2011): "Environmental Permitting of Projects and Activities, Regulation of Unauthorized Constructions in Relation to the Creation of Environmental Balance, and other provisions under the authority of the Ministry of Environment," refers to the environmental permitting process for projects and activities in areas included in the Natura 2000 network, incorporating relevant references to Article 6 of Directive 92/43/EEC within its paragraphs.

In Article 1 of Law 3851/10 (Government Gazette 85 A/4-6-2010): "Acceleration of the Development of Renewable Energy Sources to Address Climate Change and other provisions within the competence of the Ministry of Environment, Energy, and Climate Change," it is stated that: In Article 1 of Law 3468/2006 (Government Gazette 129 A), the existing provision is numbered as paragraph 1 and paragraphs 2 and 3 are added as follows: "2. Climate protection, through the promotion of electricity production from Renewable Energy Sources (RES), is an environmental and energy priority of utmost importance for the country. 3. According to Directive 2009/28/EC (ELL 140/2009), the national targets for renewable energy sources (RES) by the year 2020 are defined as follows: a) The share of energy generated from RES in gross final energy consumption should be 20%. b) The share of electricity generated from RES in gross electricity consumption should be at least 40%. By decision of the Minister of Environment, Energy, and Climate Change, issued within three months of the publication of this document, the desired ratio of installed capacity and its distribution over time among various RES technologies, the categories of producers, their distribution among them, the reasons for its revision, as well as the reasons and the procedure for any necessary suspension of the licensing procedure and its withdrawal, are determined. Installed capacity is considered the total power output of generating stations in regular and trial operation. This decision is reviewed every two years or earlier if significant reasons related to achieving the objectives of Directive 2009/28/EC arise (replaced according to paragraph 8 of Article 30 of Law 3889/10, Government Gazette 182 A/14-10-10). C) Participation of energy produced from RES in the final energy consumption for heating and cooling by at least 20%. D) Participation of energy produced from RES in the final energy consumption in transport by at least 10%."

Also, according to Article 8 of the aforementioned law concerning the modification of provisions for more effective addressing of climate change:

1. The title of Article 8 of Law 1650/1986, as it stands, is amended to "Measures for the protection of the climate and the atmosphere," and paragraphs 1, 2, and 3 thereof are renumbered as 2, 3, and 4, respectively. Additionally, a new paragraph 1 is added as follows:

   "1. By implementing appropriate measures, renewable energy sources are prioritized to address climate change, protect the atmosphere, ensure sustainable energy supply for the country, achieve sustainable development, and utilize national resources sustainably."

2. In Article 19 of Law 1650/1986, paragraph 6 is added as follows:
   "6. As an exception, in the areas (a) of paragraphs 3, 4, and 5 of this article, excluding possible segments of these areas that constitute Wetlands of International Importance (RAMSAR wetlands) and priority habitats of areas within the Territory that have been included in the Natura 2000 network, in accordance with Commission Decision 2006/13/EC, as well as (b) in the neighboring areas of paragraph 4 of Article 18 of this law, the installation of stations from renewable energy sources is allowed as a means to protect the climate, provided that the conservation of the protected object of the area is ensured by the terms and conditions to be determined within the framework of the environmental terms approval of the station."
3. In paragraph 1 of Article 2 of Law 2742/1999 (Government Gazette 207 A'), subparagraph d is added as follows:
   "d. In the protection of the climate and the atmosphere, and in promoting the energy self-sufficiency of the country through the utilization of Renewable Energy Sources.
4. In paragraph 2 of Article 2 of Law 2742/1999, subparagraph (iv) is added as follows:
   "Iv. The priority promotion of Renewable Energy Sources, based on the sustainable utilization of national resources, in accordance with international and European obligations."

According to Ministerial Decision No. Η.Π. 37338/1807/Ε.103 "Determination of measures and procedures for the conservation of wild bird species and habitats/areas, 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," specifically in paragraphs 2, 3.1, 3.2, and 3.3 of Article 5 concerning the protective measures and conservation of Special Protection Areas (SPAs), it is stated that:

2. Any plan or program falling under the provisions of Ministerial Decision No. 107017/2006 (Government Gazette B' 1225), which is not directly related to or necessary for the management of a Special Protection Area (SPA) but may significantly affect it, either alone or in combination with other plans or programs, shall be duly assessed for its impacts, considering the conservation objectives of the SPA in question. Based on the conclusions of the impact assessment on the SPA, the competent authority agrees to approve the relevant plan or program only if significant adverse effects on the ecological balance and integrity of the SPA do not occur.

3.1 Any project or activity, indirectly linked or necessary for the management of an SPA, which could significantly affect it, either alone or in conjunction with other projects or activities, is thoroughly assessed for its impacts, considering the conservation objectives of the relevant SPA.

3.2 For every project or activity requiring environmental permit approval, according to the provisions of Articles 3 and 4 of Law 1650/86, as amended, the assessment of impacts on the SPA is conducted during the process of preliminary assessment, evaluation, and approval of environmental terms of the project or activity, in accordance with the relevant provisions, taking into account the relevant ornithological data that the interested party is obliged to submit. Based on the conclusions of the impact assessment on the SPA, the competent authority agrees to proceed with the project or activity only if there are no significant adverse effects on the ecological balance and integrity of the SPA.

3.3 If, despite the negative conclusions of the impact assessment and the absence of alternative solutions, a project or activity must be carried out for other compelling reasons of significant public interest, including social or economic reasons, the competent authority takes all necessary compensatory measures to ensure the protection of the overall coherence of the NATURA 2000 network.

According to paragraph 8 of Article 5 of Law 3937/11 (Government Gazette 60 A/31-3-2011), titled "Biodiversity Conservation and other provisions," it is stated that: "In areas: (a) of paragraphs 3, 4, 5, and 6, with the exception of their parts that constitute areas of paragraphs 1 and 2, wetlands of international importance (RAMSAR wetlands) and priority habitat areas of the Territory that have been included in the Natura 2000 network, according to Decision 2006/613/EC of the Commission, as well as (b) in the neighboring areas of paragraph 4 of Article 18, the installation of stations from renewable energy sources is allowed as a means of climate protection, provided that the terms and conditions set forth within the framework of the approval of the environmental terms of the station ensure the preservation of the protected object of the area." The permissible areas referred to in paragraphs 3, 4, 5, and 6 of Article 5 of this law are the areas designated as Natural Parks (National Parks and Regional Parks), Habitat/Species Protection Areas distinguished into Special Areas of Conservation, Special Protection Areas, and Wildlife

Refuges, areas designated as Protected Natural Formations, and Aesthetic Forests, Peripheral Forests, Protected Forests, and Preserved Nature Monuments.

According to paragraph 5 of Article 9 of Law N. 3937/11, which concerns regulations for the protection and management of Natura 2000 areas, it is stated that: "The first paragraph of paragraph 2 of Article 6 of the joint ministerial decision of the Ministers of Interior, Public Administration and Decentralization, National Economy and Finance, Development, Environment, Spatial Planning and Public Works, Agriculture, Merchant Marine, and Culture of 11.12.1998 (Government Gazette 1289 B') is amended as follows: In SPA and SCI areas, excluding priority habitats and species habitats, the layout of projects and the approval of plans are allowed, on a case-by-case basis, the impacts of which have been assessed as highly significant in the respective environmental impact assessment, only if, based on sufficient documentation, they are assessed as urgent matters of public economic or social interest, there is no alternative solution, and adequate compensatory measures have been provided to ensure the overall coherence of the Natura 2000 network of protected areas. Within two months of the approval of these projects and plans, the Minister of Environment, Energy, and Climate Change informs the European Commission about the expected impacts and the compensatory measures taken.."

According to the decision with number Our Ref. 8353/276/E103, which modifies and supplements the ministerial decision with number 37338/1807/2010, titled "Determination of measures and procedures for the conservation of wild bird species and habitats/habitat types, in compliance with Directive 79/409/EEC..." (Official Gazette B' 1495), in accordance with the provisions of the first paragraph of Article 4(1) of Directive 79/409/EEC "On the conservation of wild birds" of the European Council dated April 2, 1979, as codified by Directive 2009/147/EC, specific protective measures are determined for the implementation of projects and activities, as well as specialized measures (measures, conditions, and restrictions) of special protection for the installation and operation of Wind Power Plants (WPP).

Indicatively from the above, reference is made to the provisions outlined in paragraphs 1, 3, and 4 of Article 5B:

> *"1. The installation of Wind Power Plants is not allowed within NATURA 2000 areas whose boundaries coincide with the boundaries of Ramsar Wetlands, as submitted to the Secretariat of the Ramsar Convention by Law 191/74 (Government Gazette A' 350), Law 1751/88 (Government Gazette A' 26), and Law 1950/91 (Government Gazette A' 84). If the boundaries of a NATURA 2000 area exceed the boundaries of the corresponding Ramsar Wetland, then the installation of Wind Power Plants is not allowed within a radius of three (3) kilometers (within the NATURA 2000 area) from the boundaries of the wetland."*
>
> *(…)*
>
> *"3. For the installation of Wind Power Plants (WPPs) within NATURA 2000 areas, with species such as the griffon vulture (Gyps fulvus), Egyptian vulture (Neophron percnopterus), cinereous vulture (Aegypius monachus), bearded vulture (Gypaetus barbatus), golden eagle (Aquila chrysaetos), white-tailed eagle (Haliaeetus albicilla), Bonelli's eagle (Hieraaetus*

fasciatus), Eleonora's falcon (Falco eleonorae), black stork (Ciconia nigra), lesser kestrel (Falco naumanni), peregrine falcon (Falco peregrinus), marsh harrier (Circus aeruginosus), Montagu's harrier (Circus pygargus), short-toed eagle (Hieraaetus pennatus), Long-legged Buzzard (Buteo rufinus), lanner falcon (Falco biarmicus), Dalmatian pelican (Pelecanus crispus), great white pelican (Pelecanus onocrotalus), Audouin's gull (Larus audouinii), Cory's shearwater (Calonectris diomedea), and levantine shearwater (Puffinus yelkouan), the ecological assessment specified in Articles 10 and 11 (paragraphs 8, 9, and 10) of Law 4014/2011 must include a special ecological evaluation. In addition to the specialized ornithological data specified in paragraph 2 of Article 5A, the assessment should define an additional exclusion zone from nests and/or colonies of the aforementioned species. For this determination, the size and technical characteristics of the project are considered, along with the positions and number of nests of the species in question, the classification of nests into active, inactive, and historical, the significance of the colonies, the mapping of species' feeding areas and their flight habits, their correlation with the placement of wind turbines, protective measures, and other relevant parameters.

1.1 *The impacts on the population of the designated species considered in determining the exclusion zone perimeter in each case are a) bird mortality due to collision (bird strike/collision), b) changes in habitat structure, and c) displacement of bird populations from habitats.*

2. *The Environmental Terms Approval Decision (ETAD), issued in accordance with the relevant provisions of Law 4014/2011, for the installation and operation of Wind Power Plants within SPA areas, includes the obligation to use underground power cables or, where this is not feasible, bundled insulated overhead power cables for connection to the grid. Additionally, there is an obligation for regular monitoring of the station area (on a weekly or more frequent basis as needed) and removal of dead animals (mainly livestock), the presence of which could attract scavenging birds of prey. The possibility of installing acoustic, visual, or other signaling should be examined in relation to the layout of the wind farm, its distance from cliff edges and nesting, feeding, and resting sites, as well as its scale and size."*

4. Bibliographic review of possible impacts of wind farms on avifauna-wildlife

Impacts on avifauna

For the extraction of safe conclusions allowing competent authorities to ascertain to what extent the studied project will negatively impact the integrity of the site, a suitable and reasoned assessment based on the Guidelines for the Conservation of Rare and Threatened Species and Habitats of European Interest is required. This assessment should be based on reliable scientific field data as well as bibliographic data. Understanding the negative impacts that wind farms may have on bird populations is an essential tool for accurately determining the necessary assessment and evaluation of the effects that Special Protection Areas for Birds and other Protected Areas may have on the structure and function of the study area. This is crucial for addressing, with the utmost safety, whether the integrity and conservation objectives of the Natura 2000 area are compromised, as well as the coherence of the Natura 2000 Network.

According to decision number Our Ref. 8353/276/E103: "Amendment and supplementation of ministerial decision number 37338/1807/2010 'Determination of measures and procedures for the conservation of wild bird species and habitats/sites, in compliance with Directive 79/409/EEC...' (B' 1495), in accordance with the provisions of the first paragraph of paragraph 1 of Article 4 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."

The impacts on the population of the characterized species examined in determining the perimeter exclusion zone in each case are:

- bird mortality due to collision
- change in habitat structure
- habitat displacement

Also, according to - Joint Ministerial Decision Number. 170225 (Government Gazette Issue 135/B/27-01-2014): For the proper assessment and evaluation of the impacts of the project or activity under consideration (including alternative solutions as well as cooperative and cumulative impacts with other projects or activities), the entirety of the data and methods used are described, and each case where the project may:

- Cause delays or interrupt the progress towards achieving the conservation goals of the relevant Natura 2000 area as defined.
- Reduce the extent or fragment the habitat types of the Natura 2000 area, threatening its integrity, or affect the representativeness and degree of conservation of their structure and ecological functions.
- Reduce the population of species or affect the degree of habitat conservation, or fragment them, or disrupt the balance among species, or affect their degree of isolation.
- Cause changes in vital parameters (e.g., nutrient balance, soil degradation from potential erosion, dynamics of biotic and abiotic parameters) that determine how the Natura 2000 area functions.
- Interact with predicted or anticipated natural changes in the relevant Natura 2000 area.

Based on the available Greek and foreign literature, the main categories of impacts from the installation and operation of wind farms are grouped into impacts due to direct or indirect (due to congestion) loss of habitat, which is attributed respectively to changes in habitat or indirect loss due to noise, visual congestion, etc., impacts due to collisions with wind turbines resulting in the death or injury of individuals, and impacts due to the creation of obstacles-barriers to bird movement (European Commission 2011, Gove et al. 2013, Schuster et al. 2015, Gibson et al. 2017). The topography of the installation area, the habitats affected, the number and species of birds observed in the area are some of the parameters that affect the intensity of potential impacts (Strickland et al. 2011). Areas that serve as gathering spots for a large number of birds due to the increased presence of a resource vital to their biology, such as wetlands, or areas that serve as significant migratory corridors for migratory species, tend to be more sensitive.

Disruption can occur during the construction and/or operation of wind farms, caused either by the presence of wind turbines (visual or auditory disturbance) or as a result of vehicle and personnel movements (Rydell et al. 2012). It can also stem from increased accessibility (to humans and hunters) due to the opening of new roads or heightened sensitivity to hunting due to disturbance, among other factors. Birds may completely avoid an area (full avoidance), be present but in reduced numbers (partial displacement) or remain in the vicinity of the wind farm after construction but may be subjected to other disturbance impacts such as reduced productivity or increased mortality (Gove et al. 2013). Especially for territorial species, the presence of wind farms near nesting areas may increase, apart from the risk of collision, the likelihood of nest abandonment by pairs. In cases where there are no alternative sites, pairs may potentially remain in place without completing their reproductive efforts (WWF 2013). Raptors are generally more sensitive to disturbance near nesting areas, and their activity near these areas is more intense. Therefore, it is generally recommended to avoid installing wind farms near known nesting sites (Bright et al. 2009). The potential displacement from their feeding area may also affect their choice of nesting site. In the literature, there are cases reported of displacement of mainly raptor species from their foraging areas and hunting grounds (Hotker et al. 2006, Pearce-Higgins et al. 2009, Smallwood et al. 2009). The distances of disturbance can vary and usually depend on the species under study. For example, Peace-Higgins et al. (2009) in the UK reported decreases in the frequency and densities of some species (*Buteo buteo, Circus cyaneus*) at distances of 500 m from wind turbines by 15-53%, while no changes in the flight height of raptors were observed in the vicinity of wind turbines. The displacements that are observed are likely to be transient and then the species, accustomed to the low-level disturbance, return to their previous activity. Fielding and Haworth (2013) observed a decline in golden eagle activity in the area during the first period of operation of the wind power plant, with activity subsequently returning to its original levels. Noteworthy evidence of displacement of the species was reported by Fielding and Haworth (2010) for three wind power plants in Scotland. A study conducted in the USA estimated a 47% reduction in predator abundance following the construction of wind power plants with most individuals remaining within a hundred meters of the turbines, while impact mortality was estimated to be extremely low (Garvin et al. 2011). However, some studies have reported an increase in the flight activity of some species in the vicinity of wind power plants (Barrios and Rodriguez 2004, Smallwood and Thelander 2004, Smallwood 2007, Smallwood et al. 2009). There are studies reporting displacement of predators from their breeding territories and cases of predators nesting near wind turbines (Janss 2000, Dahl et al. 2011). According to Pearce-Higgins et al. (2012) there is evidence that disturbance during the construction phase may be more important and more decisive than disturbance during the operational phase of the wind power plant. A reduction in occupied territories after construction of a wind power plant (partly due to disturbance effects) has been reported for sea eagle in a region of Norway (Bevanger et al. 2010, Dahl et al. 2011), while a similar study of wintering gulls nesting in close proximity to a wind power plant with twenty-eight turbines in Scotland, found that the species continued to nest in very close proximity to them, flight density in the wind power plant installation area decreased after the construction phase, and no significant impact was found on population density or breeding success (Forrest et al. 2011). Passeriform birds are not considered to be particularly sensitive at the population level to impacts from wind power plants (Gove et al. 2013) due to the different evolutionary growth strategies they use (r-selection species), and in some cases increases in some species have been recorded after the wind power plant construction, possibly in response to new habitat creation (Bevanger et al. 2010, Pearce-Higgins et al. 2012). In most cases, disturbance impacts on these species are limited to a short distance from the installed turbines, are not likely to cause changes in the abundance of breeding species and may occur during the construction phase and then be eliminated (Leddy et al. 1999, Hotker et al. 2006, Devereux et al. 2008, Pearce- Higgins et al. 2009, Rydell et al. 2012, Battisti et al. 2014). Leddy et al. (1999) found increasing densities of passeriform birds in grassland (with increasing distance from wind turbines) and higher densities in the reference area compared to 80 m from wind turbines, confirming displacement, at least in this case, while similar patterns are reported by Pearce-Higgins et al. (2009) and Bevanger et al. (2010). Pearce-Higgins et al. (2009) report 100-200m displacements from the wind turbines for the species: Anthus pratensis and Oenanthe oenanthe. Reduced densities (~12%) are also reported by Fernandez-Bellon (2018) in Ireland (in upland areas with wind compared to witness areas without wind) with most obvious/significant effects within 100m of W/Ts (~30% reduction). Hale et al. (2014), in grasslands in the USA, did not detect displacements within 500-750m of W/Ts for the 3 most abundant species. In contrast, Reichenbach & Steinborn (2011), report (during a 7-year BACI survey of grasslands in Germany) that there were no displacement effects for most breeding species, while effects were more evident for stationary (migratory) species (this is also inferred from Hotker's 2017 review). Small displacement effects were also found in a study in Portugal (Bernardino 2011) and Spain (Farfan et al. 2009), while studies on wintering species in agroecosystems showed very small effects (Devereux et al. 2008). Also, a study in Italy (two years, in an wind power plant at an altitude of 800 - 1300 m) (Battisti et al. 2014) found no difference in the abundance (and number) of breeding species between the wind farm site and the witness (control) site, while Bennett et al. (2014), studying Passeriformes nesting in bushes in the USA, reported a general lack of correlation of reproductive success of different species with distance from the wind power plants. Another study in Italy (four years before and four years after construction) (Garcia et al. 2015) reported a slight decrease in the abundance of Passeriformes in the construction phase, and a gradual increase thereafter. In an extensive BACI survey in the USA (three wind power plants in grassland habitats in 2003-2012, investigating for impacts, displacement, or recruitment, one year after construction or 2-5 years after) (Shuffer and Buhl 2015), displacement impacts were identified for 7 of 9 breeding species (while recruitment was observed for one species and no differentiation was observed for another). Displacement (and attraction) was generally observed within 100 m and often extended up to 300 m, with impacts observed one year after construction and for at least five years. In a year-round study of avian biocommunities in a wind power plant in Poland (Rosin et al. 2016), among the variables affecting species diversity and abundance was the distance to the nearest W/T (positive correlation). For wintering wetland species (wading birds and waterfowl), disturbance distances (i.e. the distance from the wind power farms to which birds are absent or less abundant than expected) are 850m (Pedersen and Poulsen 1991, Kruckenberg and Jaene 1999, Larsen and Madsen 2000, Madsen and Boertmann 2008), while 600m is considered the maximum distance that has been reliably recorded (Langston and Pullan 2003, Drewitt and Langston 2006). Thus, assuming that there is no "habituation", Gove et al. (2013) propose a full avoidance zone of 300m radius (from the W/Ts) and a displacement of 600m. For breeding waders, the distances of disturbance reported are generally shorter (Hötker et al. 2006, Bevanger et al. 2010) but to draw more reliable conclusions, long-term investigation of the effects is needed (to examine the reaction of new individuals in the population). In most cases, distances of up to 500m are reported (Hötker et al. 2006, Pearce-Higgins et al. 2009, Bevanger et al. 2010), while some species show a higher sensitivity (Numenius arquata, 800m). Fielding and Haworth (2015a, 2015b) studied the presence of 2 breeding species (Calidris alpina, Pluvialis apricaria, wetland/upland moorland and tundra species) in a wind power plant in Scotland, did not detect changes in the abundance and location of territories (while another study using the BACI method observed declines for Pluvialis apricaria at 400m from the W/T in the operational phase, Sansom et al. 2016). In a BACI study in Bulgaria (Zehtindjiev et al. 2017), it was reported that when comparing standards in wintering populations of Branta ruficollis in an area with 200 W/T, no evidence of disturbance was detected (compared to the situation before the construction of the Wind power plant).

Direct mortality of birds can be caused by collisions to the installations of the wind power plants and mainly with the wind turbines (but also with the pylons, cables, wind masts, etc.). The likelihood of colliding to wind farms can be influenced by a multitude of factors related to the installation area, the characteristics of the wind power plant and the number and characteristics of species operating in the wind power plant installation area (Marques et al. 2014, Zwart et al. 2016). Rydell et al. (2012, 2017), in a review and post-analysis of the literature, report that mortality rates are higher in wind power plants near wetlands and in coastal areas and ridges, and generally lower in open farmland and other habitats. Greater risk on ridges, and especially in gaps and notches is also reported by the USFWS (2003). Katzner et al. (2012), studying the flight patterns of Golden Eagle individuals on local movements or migration (in the USA, via satellite telemetry), report that presence was most common at low altitudes over areas with steep slopes and ridges (where updrafts are generated, especially on windward slopes), while birds were observed at higher altitudes in areas with milder slopes. Birds of large body size with limited manoeuvrability (such as swans, geese, and scavengers) are generally at greater risk of impact with installed turbines (Brown et al. 1992, Janss 2000) and species that typically fly at dawn and dusk or at night are less likely to detect and avoid them (Larsen and Clausen 2002). However, according to Rydell et al. 2012, the sensitivity of nocturnal species to impacts is low. For vultures, there is evidence that their sensitivity to collisions is also related to their vision adaptations (for feeding, field of view towards the ground rather than in the direction of flight, Martin et al. 2012). Carrete et al. (2011) report that vulture mortality is related to the distribution and concentration of the species (colonies, rookeries) in the area, concluding that it is significantly related to the relative location and distance from critical habitats of the species. The collision risk may vary for each species depending on age, behavior, and phase of the annual cycle, and is clearly influenced by weather conditions, by an increase in collisions due to poor visibility (low cloud cover or rain), by strong frontal winds, etc. (Karlsson 1983, Winkelman 1992b, Richardson 2000, Erickson et al. 2001, Skov and Heinänen 2015). Also, the time of year may affect the probability of large scavengers being encountered due to its effect on the warm updrafts used by these species. According to Barrios and Rodriguez (2004), incidents of vulture strikes occurred at an increased rate during the fall and winter due to the absence of thermal updrafts and use of upslope currents near wind turbines. Moreover, the seasonal variation in wind intensity may also affect the probability of collision of the above species due to its effect on the maneuverability of these birds (Barrios and Rodriguez 2004). As regards predator species, there also seems to be a clear differentiation between hawks (lower sensitivity except for the rockhopper) and other predator species. Passeriformes and other ground dwelling species show lower collision impacts (Bright et al. 2009) however, they may be sensitive during migration (Marques et al. 2014).

The exact location of the wind power plant, the size and layout of the wind turbines and the speed of the rotor can be critical variables affecting impact mortality. In a later meta-analysis for 15 wind power plants (Marques et al. 2017b), it was found that the important parameters were: orientation (higher mortality in NW facing locations), vegetation type (higher mortality in shrublands) and slope (higher in relatively flat areas). Topographical features that are likely to be used by categories of birds to gain height or the topography of the wind power plant site that may 'lead' large numbers of birds towards a particular wind power plant site, may increase the collision mortality rates. The potential effects of wind turbine lights are poorly understood with no strong correlation (Rydell et al. 2012), although there have been reported cases of high mortality in migratory Passeriformes attributed to disorientation due to lights (Gauthreaux and Belser 2006).

Collision rates per wind turbine vary considerably with the average ranging from 0.01 to 60 bird collisions per year (Drewitt and Langston 2008, Gove et al. 2013). Lekuona and Ursua (2007), during a three-year study of 13 wind power plants in Spain (Navarra), calculated a collision risk index (specific risk index) for the species in the area, based on the proportion of observation time in the rotor sweep zone relative to the total observation time of each species. This is a risk index based on the behavior and ecology of the species ("how often they are in the endangered zone"), but without considering the inherent vulnerability of some species due to e.g., low maneuverability etc. As expected, this indicator is generally higher for predators and other large species (0-27%), and very low (0-9%) for most passeriformes and other ground-dwelling species (which generally move at lower altitudes than rotors).

Although the use of the site depends on the area, it is worth mentioning that in this study, the risk index was high for the white stork (Ciconia ciconia), the two species of the genus Milvus, the Bearded Vulture (Gypaetus barbatus), the Egyptian vulture (Neophron percnopterus), the booted eagle and the vBonelli's eagle (Hieraaetus pennatus and H. fasciatus) and the common kestrel (Falco tinnunculus). As regards passeriformes (and other ground-dwelling species), the highest index values were for species such as the Alpine swift (Tachymarptis melba), woodlark (Lullula arborea), Tawny pipit, Tree Pipit (Anthus campestris, A. trivialis) and Red-billed chough (Pyrrhocorax pyrrhocorax). Finally, it should be noted that when monitoring mortality from collisions in the same study, the highest values were for the Griffon Vulture (Gyps fulvus), for which the risk index was relatively low (5.5%).

In a comprehensive analysis of findings for 44 wind power plants in Portugal (2005-2015, Marques et al. 2018), the most frequent findings were from *Delichon urbicum, Apus apus, Alauda arvensis, Lullula arborea, Sylvia undata, Alectoris rufa, Buteo buteo, Gyps fulvus, Falco tinnunculus, Ficedula hypoleuca, Phlloscopus collybita, Circus pygargus*. These are mainly species that air-feed in flocks (swallows/ ashtrays, they may also be attracted to the vicinity of W/T to feed on insects) and species of the family Alaudidae (larks etc.) that also flock (outside the breeding season), display flights (at high altitude) during the breeding season and their habitat often coincides with areas of wind power plant development. In general, species of the family Alaudidae show increased vulnerability to collisions (Erickson et al. 2014, Bastos et al. 2016, Grunkorn et al. 2016).

In a particularly extensive four-year survey in Germany for 46 wind farms in low altitudes (Grönkorn et. al. 2016, PROGRESS project), 291 findings were identified, with most common species the *Columba palumbus, Anas platyrhynchos*, as well as *Buteo buteo, Vanellus vanellus, Pluvialis apricaria, Milvus milvus, Falco tinnunculus*. Extrapolating the results to the wider area, this applies to 0.4% of the breeding population for *Columba palumbus*, 4.5% for *Anas platyrhynchos* and 7% for *Buteo buteo*, while population impacts may occur for *Buteo buteo, Milvus milvus*. According to another database, the most common victims to the German wind power plants *are Buteo buteo, Milvus milvus, Haliaeetus albicilla* (De Lucas and Perrow 2017). In Spain, the most common victims are *Gyps fulvus, Falco tinnunculus, Circaetus gallicus*, while proportionally (relative to population) many victims are also reported to be *Hieraaetus pennatus, Falco tinnunculus, Circus pygargus*.

It is important to note that the relationship between site use by predators (or abundance/density) and mortality (from collisions) is not clear and such a relationship is not general but is highly dependent on species behavior and site topography (Erickson 2009, Grünkorn et al. 2017). This is also evident from Ferrer et al. (2011) who studied site use (before construction) and mortality (during operation) data for 53 wind power plants in Spain. Although there was considerable variation in site use across parks, this variation was not significantly associated with the mortality observed during operation. Similar conclusions (absence of a correlation between abundance and mortality) were reached by de Lucas et al. (2008) and Garvin et al. (2011). In contrast, Lazo et al. (2012), using a larger corresponding dataset (also in Spain, 154 wind power plants), report that there is a correlation between site use (before construction) and mortality, while Kitano and Shiraki (2013) reach to the same conclusion. In the extensive study in Germany (Grönkorn et. al. 2016, PROGRESS project), no correlation was found between flight activity for Falcon and collision fatalities (and estimation via the Band model led to an underestimation of fatalities). Rydell et al. (2012) in a literature review estimated the median mortality at 2.3 dead birds per wind turbine per year, with values being higher in studies in Europe than in North America. In a literature review for Canada, Zimmerling et al. (2013) reported mortality values from 0 to 26.9 birds per wind turbine per year, with a median value of 8.2.

Some of the highest levels of mortality have been recorded for predators in Altamont Pass (7. 000 wind turbines) in California (Howell and DiDonato 1991; Orloff and Flannery 1992) as well as in Tarifa and Navara, Spain, Zeebrugge, Belgium (mainly gulls and terns, Everaert and Stienen 2008) while in recent years there has been a notable mortality (collisions, 39 individuals in 2006-2010) of the sea eagle (Haliaetus albicilla) in wind power plants on Smoela Island (Norway, Bevanger et al. 2010, Dahl et al. 2011). These cases were of particular concern because they involved rare and long-lived species (such as the vulture and the golden eagle, which have low reproductive rates and are more vulnerable to additional mortality). However, at Altamont, replacement of old-style wind turbines with new turbines appears to have resulted in a reduction in mortality (Smallwood and Karas 2009). In some cases, papers report potentially significant population impacts for some species such as Egyptian vulture (Carrete et al. 2009) and osprey (Bellebaum et al. 2013, Sanz-Aguilar et al. 2015). The effect of tower height as well as the sweep area of wind turbines is not clear (AWWI 2014) and depends significantly on both species and area (Marques et al. 2014). Despite the given potential impact of wind power plants on avifauna, there is a plethora of published studies reporting that bird mortality from wind power plants is very low compared to mortality from other causes (Erickson et al. 2001, Kerlinger 2001, Percival 2001, Langston and Pullan 2003, Marris and Fairless 2007, Zwart et al. 2016, Gibson et al. 2017), with the National Academy of Sciences (2007) reporting that only 0.003% of bird mortality from anthropogenic causes is due to wind turbines.

Impacts from bird collision on wind turbines during migration do not appear to be very high, with the exception of migratory passes, as the flight height of birds is usually greater than the height of the turbines and therefore collision rates are usually very low and without impact on the population (Richardson 2000; Kunz et al. 2007, Erickson et al. 2006, Zehtindjiev and Whitfield 2009), and birds during the day appear to have the ability to detect and avoid wind turbines. According to de Lucas et al. (2004) in most cases of birds approaching wind turbines (72%) birds appear to perceive them to change direction with the proportion being even higher when the rotors are in motion, and the above avoidance ability is reported by other studies (Smallwood and Thelander 2004, Smallwood et al. 2007, Johnston et al. 2014).

The impact of direct loss or change in habitat structure and fragmentation from the installation of a wind power plant is considered minor (Bright et al. 2009, Percival 2000, Gove et al. 2013), although this depends on the area occupied. More significant in this case are the impacts on rare species with a restricted distribution likely to be present at the site and the cumulative effects of multiple projects on habitat area. Actual habitat loss is typically between 2 and 5 % of the total area of the development site (Fox et al. 2006) or 5 - 10 % (Silva and Passos 2017). More extensive impacts may occur in specific habitats due to hydrological changes, changes in microclimate, severe erosion after construction, introduction of foreign species, etc. (Gave et al. 2013). Habitat changes may also result in increased density for some passeriform species (Pearce-Higgins et al. 2012) or increased flight activity for some predators. In a review for a large number of wind power plants in Canada (Zimmerling et al. 2013), direct habitat loss was estimated at 1.23 ha per W/T (including associated projects). Battisti et al. (2016) in a study on the wind power plant installation in a Mediterranean landscape with a mosaic of oak forests (Abruzzo, Italy), with W/T (and associated infrastructure) covering about 10% of the area (i.e. limited local perforation/dissection impacts), no differences were identified between the wind power plant area and the witness area in terms of the composition and structure of the avifauna biocommunity (in terms of species diversity, relative abundance, etc.). Habitat fragmentation is expected to influence species abundance and diversity only in cases of large area loss, e.g., >70% (Andren 1994, Parker and Mac Nally 2002).

The effect of the operation of wind turbines as a containment barrier relates to the fact that birds have to increase energy expenditure to avoid all the turbines when moving between roosting, feeding, breeding, etc. The extent of the effect depends on the type of bird, type of movement, flight altitude, distance from the turbines and their layout, time of day, wind intensity and direction, and can range from a slight delay in flight to significant diversions that can reduce the number of birds using the airspace of the wind power plant. However, the above impacts are usually not significant for bird populations (EC 2010, Rydell et al. 2012), though cases have been reported where no change in species numbers and population sizes was observed following the construction and operation of an NPP, but changes in species passage behavior were noted, with most species flying at higher altitudes than the existing standards before the wind power plant is installed (Tome et al. 2011, Tome et al. 2012). Although, no changes in species numbers and population sizes were observed after construction and operation, changes in species passage behavior were detected. Thus, the movements of medium-sized raptors (Bonelli's eagle, Booted eagle, European Honey Buzzard) near the W/Ts decreased, while the passage patterns of other species (e.g., Griffon Vulture, Cinereus Vulture, Short-toed eagle) were not affected. In addition, most species passed at a higher altitude (compared to standards prior to the installation of the WPP). A similar study in Portugal (Tome et al. 2017, WPP with 25 W/Ts) did not identify patterns of macro-avoidance, but of mid-avoidance (W/Ts and line W/Ts) for hawksbills and wedge-tailed godwits (decreasing proximity passes, increasing minimum distance from W/Ts, increasing flight altitude), with wedge-tailed godwits appearing more sensitive (changing course at greater distances and making 'spiral' flights when inside the WPP). The vultures' reactions to the presence of the W/T were much more limited. Similarly, in the case of a WPP in Sweden, a comparison of migratory bird passage patterns before and after construction showed clear avoidance of the WPP area by birds since during operation they passed through the adjacent areas with greater frequency (Bernhold et al. 2013) and Farfan et al. (2009) reported that most passages were parallel to the WPPs rather than between them. In an extensive study conducted in 2009 - 2014, in an area of significant migration in Mexico (Cabrera-Cruz and Villegas-Patraca 2016), the effect of the WPP (~7.5 km long at the end of the study) on the passage patterns of passing birds of prey (direction and "intersections" with the wind farm site, before and after construction) was investigated, and fewer "intersections" were identified after construction (i.e. Macro-avoidance). Long-avoidance in terms of swan crossings in migration after wind farm construction was also identified in a study in Japan (Moriguchi et al. 2017) and for raptors in an offshore wind farm between Denmark and Sweden (Jensen et al. 2017).

Some cases are reported in the brief by Schuster et al. (2015), for marine WPPs (Masden et al. 2009; Pettersson 2005, 2006). For example, in WPPs in Sweden, a slight increase in covered distance of 0.2-0.5% is reported (due to a change in migratory pathway), while an increase in "energy costs" of 0.5-0.7% is reported for a species of the genus Somateria during migration. Some additional examples are also given in the section above on impacts (paragraph on avoidance).

Studies on the impacts of the WPPs on avifauna in Greece and more specifically in the wider study area have been carried out by WWF Hellas as well as by other scientists, with proposals for the proper siting of the WPPs. WWF Hellas (2008) presented the "Proposal for the Proper Siting of Wind Farms in Thrace", which defines sites and areas of exclusion and increased protection, while in 2013, taking into account the new field data, it published the "Revised Proposal for the Proper Siting of Wind Farms in Thrace", which updates and replaces the previous one (WWF 2013), again proposing the establishment of exclusion zones for the siting of WPPs (high use zones of Cinereus and Griffon vultures, high frequency zone of presence of Cinereus vultures, areas of the National Forest Park of Dadia - Lefkimi - Soufli and Evros Delta, pine forest of Loutroi, Griffon vulture colony area in GR1110009, as well as circular areas of at least 1 km radius) and the establishment of a new exclusion zone for the siting of WPPs. (Vasilakis et al. 2008, Noidou and Vasilakis 2011) and Increased Protection Zones where the siting of WPPs is allowed under certain conditions (the remaining areas within the SPAs of the region, but also areas outside them where the Cinereus vulture is active, with moderate - low use and moderate data frequency, as well as a radius of 5 km from raptor species with a large territory).

The paper by Ruiz et al. (2005) reports on impact effects and flight behavior of raptors in the Thrace region in existing WPPs, where few impact cases were recorded, and not on raptors, with mortality events concentrated at the beginning of the breeding season. Few of the raptors with territories in the area flew into the turbines' danger zone, with a small proportion of these flights occurring near the turbine sweep area, at the edges of the wind farms. In contrast, for scavenging species using the above area for foraging, the proportion of flights in the danger zone was much higher, and all of these flights were recorded in the wind turbine sweep area, with recorded cases of vultures changing direction to find a suitable access point between wind turbines.

According to work carried out by Carcamo et al. (2009) and Carcamo et al. (2011) at existing wind farms in Thrace, four dead Griffon Vultures and Booted Eagles, as well as individuals of eleven other non-predatory bird species, were found within 50 m of the wind turbines. More than half of the flights recorded were by Griffon Vultures, Cinereus Vultures and Buzzards. Following the work of Kret et al. (2011) and Doutau et al. (2011), dead individuals of one Cinereus vulture, two short-toed eagles, three buzzards, one marsh harrier and two sparrowhawks, as well as a large number of other non-predatory birds (73 individuals) were again identified in existing wind turbines in the above area, with an estimated mortality rate of 0.152 and 0.173 birds of prey per year and per wind turbine. However, the number of expected Cinereus vulture mortalities in the same area appears to be much higher, based on the application of mortality prediction models using primary data from field observations and radio telemetry data and extrapolation to a larger number of wind turbines, where mortality is estimated to be 10-20 individuals/year (a very high number compared to the total population of the species in the area, Vasilakis et al. 2009), while more recent data (Vasilakis et al. 2016) predict a mortality rate of 5.6 individuals/year, equivalent to 5.4% of the population, if the avoidance rate is 99%, and a doubling of the population loss rate (10.8%) if the avoidance rate is 98%. Furthermore, according to the data and the use of models to predict the mortality of Cinereus vultures in scenarios of simultaneous operation of all the WPPs planned to be installed in the region of Thrace, it is estimated that in the worst-case scenario we could have a total annual mortality of 45 individuals of the species, corresponding to 44% of the currently estimated population (Vasilakis et al. 2017). However, the above publication also makes predictions under much more optimistic scenarios, such as the case where wind farms are operated only in the peripheral zone, and where even with their simultaneous operation, the mortality rate of the species would be negligible.

Effects on chiroptera and appropriate management based on existing knowledge. In accordance with the revised version of the guidelines for bat surveys in wind farms (Rodrigues et al. 2014), several recent studies have demonstrated the negative effects of wind farms on populations of chiroptera (Arnett et al. 2008; Baerwald and Barclay 2014; Rydell et al. 2010a; Lehrnet et al. 2014). Mortality of bats at wind turbines is primarily due to collision and/or injury (Arnett et al. 2008, Baerwald et al. 2008, Grodsky et al. 2011, Rollins et al. 2012). As shown in the EUROBATS IWG Meeting 23 (2018) report, wind energy projects have less impact on Annex II-listed bat species than those listed in Annex IV. Species of Nyctalus and Pipistrellus, which are not listed in Annex II, account for more than 90% of recorded losses to wind farms, while Annex II species, collectively, account for less than 0.5% of losses (European Commission 2020).

There are several possible reasons for the presence and subsequent mortality of bats in the vicinity of wind turbines.

- The siting of wind turbines is one of the most important parameters (Dürr and Bach 2004). Appropriate impact assessment has led to the cancellation of wind farms at European level in several cases due to inappropriate sitting of wind turbines in relation to bats.
- At low wind speeds, insect flight and bat activity occur at higher altitudes, increasing the potential presence of bats near the rotating blades of wind turbines.
- The safety lights at the base of the tower, the color of the turbines and the noise they make are also likely to attract insects and bats into the danger zone (Horn et al. 2008, Rydell et al. 2010b, Long et al. 2011). It has been suggested that civil aviation lights above the fuselage may also attract bats, although Bennet and Hale (2014) rejected this hypothesis.
- The high speeds that the outer edges of the wings develop (they can even reach speeds of 250-300 km/h) make them undetectable to echolocating bats (Long et al. 2009, 2010a).

- In addition to the risk of direct impact, the wake effect drastically changes the atmospheric pressure near the rotating blades, increasing the danger zone and causing fatal injuries to bats (Baerwald et al. 2008).

Bats are almost ubiquitous and their mortality in wind turbines has been recorded in almost all habitat types. It is therefore likely that bats will be affected by most wind farms. When planning the siting of a wind farm, impacts such as mortality and disturbance of bats, disconnection of roosts from foraging areas, disconnection from movement or migration corridors and/or loss or destruction of habitat, and post-construction monitoring of the effects of wind turbines on bats should be considered. According to the mitigation hierarchy strategy, mitigation should be based on (a) avoiding impacts, (b) minimizing (or mitigating) impacts, and finally (c) compensating for residual impacts, in that order.

Each phase of wind farm construction and operation (before, during and after construction) can have an impact. During the sitting phase, wind turbines should be sited away from bat migration routes and corridors, and away from areas where bats forage and/or roost. Wind turbines can act as landmarks during migration or movement, which can exacerbate the impact problem. Neutral zones should be established around refuges of national or regional importance.

The presence of habitats likely to be used by bats during their life cycle, such as forests, trees, hedgerows, wetlands, water bodies, watercourses, and mountain passes, should be considered. The presence of such habitats increases the likelihood of bats being present. For example, large rivers can act as migration corridors for bat species such as *Nyctalus noctula* or *Pipistrellus nathusii*. However, high bat mortality has been recorded at wind farms even in large open agricultural areas (Brinkmann et al. 2011). Therefore, knowledge of the habitats and locations where wind turbines may have an impact is useful for decision making.

In several European countries, many wind turbines that were originally proposed in inappropriate locations where they would have impacted on bats have not been installed due to the lack of proper environmental impact assessment. For example, wind farm projects near the internationally recognized hibernacula reserves of Montagne Saint-Pierre/Sint-Pietersberg on the Belgian-Dutch border have been rejected by the authorities on bat conservation grounds.

Wind turbines should not be sited within or within 200 m of any type of forest, due to the high mortality rates (Dürr 2007, Kelm et al. 2014) and the severe habitat impacts that such sitting can have on all bat species. Mature broadleaf forests are the most important habitats for bats in Europe, both in terms of species diversity and abundance (Walsh and Harris 1996a, 1996b; Meschede and Heller 2000; Russo and Jones 2003; Kusch and Schotte 2007). However, even young, or pure pine forests can support a remarkable chironomid fauna (Barataud et al. 2013, Kirkpartrick et al. 2014, WoJciuch-Ploskonka and Bobek 2014). When wind farms are built in forests, it is often necessary to cut down trees to clear the ground on which the turbines and supporting infrastructure will be built. This is likely to result in a significant loss of shelter. Also, the subsequent increase in forest edge area increases foraging habitat for bats (Kusch et al. 2004; Müller et al. 2013; Walsh and Harris

1996a, 1996b), and thus may lead to an increase in bat activity near wind turbines, and thus mortality risk. In addition, such extensive habitat changes reduce the effectiveness of pre-construction studies in predicting the potential impacts to bats from projects. In Northern European countries with high forest cover, forests may be included in the selection of wind farm sites due to the absence of alternative sites. The importance of such sites for bat populations should be considered at a strategic level during the planning process. In these circumstances, particular attention should be paid to the national regulatory framework and planning process to ensure that wind turbines are not sited in areas of importance to bats. Despite the recommendation that wind turbines should not be installed in or within 200 meters of forests, wind farms have been licensed and are already operating in forests in European countries.

Buffer zones of 200 m should also apply to other habitats of particular importance for bats, such as tree rows, hedgerow networks, wetlands, water bodies and streams (Limpens et al. 1989; Limpens & Kapteyn 1991; De Jong 1995; Verboom & Huitema 1997; Walsh & Harris 1996a, b; Kelm et al. 2014). The same applies to all sites where high bat activity has been identified in impact assessments.

Low levels of bat activity prior to the construction phase does not necessarily mean that there will be no impact on bats in the post-construction phase, because bat activity can change due to the presence of wind turbines and supporting infrastructure, as well as from year to year. The boundaries of the buffer zone shall be measured from the outer edge of the blades and not from the axis of the tower.

Activities within the construction phase that may have an impact on bats should, whenever possible, be carried out at times of the day and year that do not affect bats. This requires local knowledge of the bat species present in the area, knowledge of the presence of hibernacula and maternity colony roosts, and an understanding of their annual life cycle. A typical year in the life of most European bat species includes a period when they are active and a period when they are hibernating. In central Europe bats are generally active from April to October and less active or hibernating from November to March. In the warmer southern and coastal climates of the west, hibernation may only occur from December to February (while in milder winters some populations may not hibernate at all). The period of activity and hibernation varies according to geographical location (longitude, latitude), but can also vary from year to year depending on weather conditions. Species behavior also plays a role, with some species that are more cold-tolerant being more active in winter than others.

The construction of wind turbines and all supporting infrastructure of a wind farm is a potential source of disturbance for bats. Supporting infrastructure includes wind turbine bases, crane treads, temporary or permanent access roads, cables for connection to the grid and buildings. Construction should take place at an appropriate time to minimize the impact of noise, vibration, lighting, and other associated disturbances on bats. Construction activities should be accurately identified in the relevant plan to ensure that they are limited to the least sensitive periods for bats in the area concerned. Based on reports, wind turbine nacelles may be used as roosts by bats. Openings and gaps should therefore be made inaccessible to bats.

The following tables summarize the types of impacts on chiroptera from the installation and operation of wind farms during the life cycle of onshore wind energy projects (Table 2) and the sensitivity of the risk of impact on European (including Mediterranean) species from wind turbines in open habitats (Table 3).

Table 2: *Types of impacts on bats during the life cycle of onshore wind projects (Source: European Commission 2020)*

Types of Impacts	**Project Phase**				
	Before Construction	Construction	Operation	Decommisioning	Upgrading
Habitat loss and degradation	X	X	X	X	X
Disturbance and displacement in places of refuge	X	X	X	X	X
Habitat fragmentation		X	X	X	
Collision			X	X	
Impact of barrier			X	X	
Barotrauma			X	X	
Loss or displacement of flight corridors and places of refuge		X	X	X	
Increased availability of invertebrate prey and therefore increased risk of collision due to nightlighting			X	X	
Indirect Impacts		X	X	X	X

Table 3: *Collision risk for European (including Mediterranean) species from wind turbines in open habitats (Source: Rodrigues 2015, as cited in the European Commission 2020 document)*

High Risk	**Medium Risk**	**Low Risk**
Species of genus Nyctalus	Species of genus Eptesicus	Species of genus Myotis
Species of genus Pipistrellus	Species of genus Barbastella	Species of genus Piecotus
Vespertilio murinus	*Myotis dasycneme*[2]	Species of genus Rhinolophus
Hypsugo savii		
***Miniopterus schreibersii*[1]**		
Tadarida teniotis		

[1] *Miniopterus schreibersii* is the only species in Annex II in the high-risk category.

[2] Water-rich regions

Impacts on other fauna (ground-dwelling mammals, amphibians, reptiles, invertebrates)

From the review of the international literature, as derived from the guidance document on wind energy projects and EU nature protection legislation (European Commission 2020), no significant impacts of the installation and operation of wind farms on other fauna (apart from avifauna and carnivores) are found, with the exception of large mammals. A review of the interactions between mammals and wind energy projects, conducted by the Swedish Environment Agency, (Helldin et al. 2012) found that there is little evidence to suggest the existence of significant impacts. However, significant avoidance by large carnivorous mammals was reported (Helldin et al. 2017). While species requiring large areas of undisturbed habitat are more likely to be at risk of significant impacts, impacts on species resistant to disturbance may also occur when conditions change in parts of the undisturbed habitat landscape (Helldin et al. 2017). Other research showed that European badgers (Meles meles) in the UK had increased levels of stress induced by wind turbine noise (Agnew 2016). Cortisol levels from badger hairs were used to determine whether stress was induced in badger physiology. Badger hair from badgers living less than 1 km from a wind farm had cortisol levels 264 % times higher than badgers living more than 10 km from a wind farm. No differences were found between the cortisol levels of badgers living close to wind farms from 2009 and 2012, which indicates that the animals are not familiar with wind turbine disturbance. Higher cortisol levels in affected badgers may have an impact on their immune system, which may result in an increased risk of infections and disease in badger populations. Łopucki (2018) observed no adverse effect on the spatial distribution of European cricetus (Cricetus cricetus) within wind farms in Poland. Łopucki, R., & Mróz, I. (2016) found no impact of wind energy projects on the diversity and abundance of small mammal species. For larger mammals, Costa et al. (2017) documented displacement of wolf (Canis lupus) nest sites up to 2.5 km in wind energy projects in Portugal. The authors also observed lower breeding rates during construction and the first years of operation. Łopucki et al. (2017) found that both roe deer (Capreolus capreolus) and hares (Lepus europaeus) avoided the interior of the wind energy project and that there was a decrease in the frequency of habitat use in an area of up to 700 m. For these species, which rely on their hearing to detect predators, this displacement may be a result of their reduced ability to detect predators, particularly where predator pressure is high. Foxes (Vulpes vulpes) have been observed to visit the inner area of the wind farm less frequently, possibly because of both reduced prey availability (hare) and reduced hearing when hunting. Foxes are likely to use the access roads and feed on the carcasses of birds killed by collisions with the operating wind turbines.

The following is a summary of parameters related to the impacts of wind farms on mammals (Source: Helldin et al. 2012, as reported in the European Commission 2020 document):

- The disturbance during construction may be temporary.

- The significance of impacts is likely to depend on habitat availability and existing levels of disturbance within the wider landscape.
- Avoidance of large areas around relevant infrastructure such as transmission lines may be observed.
- Displacement of nest sites for larger predators may be observed.
- New routes of access may facilitate the movement of individuals (but consequently bring them into contact with road traffic).
- Significant impacts are likely to occur in more remote, mountainous, and currently inaccessible areas where improved access for recreation, hunting and leisure purposes is likely to result in increased human presence and road traffic.
- Species familiarity cannot be taken for granted, as it depends on variation according to species, sex, age, individual, season of the year and type of disturbance, as well as the frequency and predictability of disturbance.
- The significance of impacts is likely to be directly proportional to the size of the wind energy project.
- The accumulation of many minor impacts may be significant at the population level.

A review of the effects of wind energy projects on reptiles and amphibians found that published data are scarce (Lovich et al. 2018). The operation of wind energy projects was found to cause occasional mortality of reptiles, resulting in long-term displacement from areas with the highest concentration of wind turbines. The Greek tortoise (*Testudo graeca*) - classified as vulnerable on the IUCN Red List of Threatened Species - may be affected by habitat loss and fragmentation near access roads due to wind farm construction in south-eastern Europe, especially when wind farms are built in rocky or steppe habitats. Research in Portugal, using modelling and simulations based on empirical data, showed that vertebrate species diversity decreased by almost 20% after the installation of two large wind turbines. Indirect impacts, however, may occur in cases where wind energy projects reduce the abundance of prey-seeking species in the herpetofauna, as indicated by increased density of reptiles and changes in their behavior, physiology, and morphology in a wind energy project in India (Thaker et al. 2018).

There is limited empirical data on impacts on insects and other invertebrates. Long et al. (2011) observed differences in insect abundance in relation to wind turbine color, and Foo et al. (2017) found that insect communities remained relatively stable between monitoring years. While the attraction of insects such as Lepidoptera (butterflies and moths) to wind turbines may be a potential concern in terms of the risk of impact on foraging bats, there is currently no evidence that wind energy projects pose a threat to insect populations.

Mitigation and monitoring of impacts

In this section, we refer to the measures and guidelines for mitigating the impacts of wind farms on biodiversity and the compensatory measures proposed on the basis of international practices that have been implemented to date, taking into account the most recent proposals of international organizations and the existing literature (Dimalexis A. 2009, WWF Proper siting of wind farms in Thrace 2008-2013, European Commission 2010, Vasilakis et al. 2017, Rodrigues et al. 2014, Rodrigues et al. 2017, European Commission 2020). 2009, WWF Proper siting of wind farms in Thrace 2008 and 2013, European Commission 2010, Vasilakis et al. 2017, Rodrigues et al. 2014, European Commission 2020), the results of research projects, the good practice guidelines for mitigating the impacts of wind farms on biodiversity that have emerged from such research projects, while testing the effectiveness of using modern technologies to achieve these objectives (Windfarms and Wildlife, LIFE Program 2013-2018).

The above measures are divided into the following categories:

- Avoidance measures
- Minimization measures
- Compensation measures

It is commonly accepted that proper sitting of any project is the safest option to minimize impacts on protected species. International evidence to date demonstrates that with proper sitting and planning, wind energy development generally does not pose a risk to biodiversity (EU Guidance document). Sensitivity mapping is also an essential planning tool that allows the permitting authorities to make informed decisions during the licensing phases of projects. In relation to the overall protected object of the Natura sites (habitat types, flora and fauna including avifauna), the appropriate sitting of wind projects through strategic planning is the most effective way to avoid negative impacts on species. As a second measure, the associated infrastructure of individual wind turbines should be carefully sited to reduce the magnitude of impacts.

The various mitigation techniques proposed in the international and national literature are not fully documented and there is usually conflicting research on the effectiveness of these techniques. The most proposed techniques in relation to the siting of such projects are:

- Avoid sitting wind turbines on parallel ridges to avoid creating barriers to bird migration.
- Encourage the placement of wind turbines in clusters to create communication corridors (flight corridors) that provide safe zones for birds to pass through. It is suggested that a ridge with its branches should be left clear and that a minimum flight corridor without WPPs should be provided for crossing the ridge (WWF 2008). During the installation and operation of a WPP, it is recommended that a number of measures are taken and implemented to minimize potential impacts on the avifauna of the area. These measures are outlined below:
- Resting or roosting areas: no perching structures that allow birds to perch or congregate should be used in any installation.

- Marking of the rotor: Birds are not able to perceive the rotor as something impenetrable once they are close to it (motion smear). This phenomenon occurs at 20 m for small blades and 50 m for larger ones. This explains the incidents of collision in conditions of good visibility. There are indications that painting the wings with a high color contrast design (e.g., black, and white discontinuous stripes) may help to reduce the risk of collision. For this reason, a possible suggestion may be to mark the blades with the relevant paint, but this is not customary practice by wind turbine manufacturers.
- Wind farm lighting: There is general agreement that permanent lighting of wind turbines should be avoided to reduce the risk of collision. Where this is unavoidable, flashing white strobe lights may be considered less attractive to birds. This measure, with its irregularly rhythmic strobe lighting, is now used in almost all modern technology wind turbines.
- The size of the wind turbines: The literature review highlights the significant differences in the impact of wind turbines on avifauna in relation to the density of turbine placement.
- Undergrounding cables: Structures such as power transmission cables should be placed after careful planning. Electricity transmission infrastructure (in general, but also in the case of wind farms) should be placed underground or, where this is not technically possible, above ground, but it should be ensured that they are properly insulated and marked to minimize the risk of electrocution and bird strikes.
- Removal of dead animals: An obligation to immediately remove dead animals (dogs, sheep, goats, horses, cows, etc.) found within 400 m of the base of the wind turbines should be provided for. These dead animals should be transported to safe places away from the wind farm (e.g., organized feeding areas), while remaining available for scavenging birds. This will reduce the risk of scavengers hitting the wind turbines when they spot each dead animal, while preserving the food available to them. The responsibility for the collection and transport of dead animals should be the responsibility of the wind farm developer and operator, and day-to-day personnel will have a responsibility to remove such potential food sources that could attract predators, particularly scavenging species, as part of their duties. Suitable disposal sites should be designated by the competent authorities after scientific study and approval, and the costs of designing, establishing and properly operating such sites should be borne by the competent regional bodies.
- Restrict the use of access roads to the maintenance of the wind farm facilities, research (monitoring programs, etc.) or to the needs of the protection and management of the natural environment by the competent authorities and bodies, to limit traffic to the minimum possible. After the installation of the wind turbines and the transport of the bulky components of the wind turbines, to restore the parts of the pavements necessary for the installation and to limit the width of the roads to the minimum necessary for the passage of vehicles.

Once a wind farm has been built, it is also necessary to actively manage the habitats in and around the wind farm to ensure that birds are not attracted to the zone of influence of the wind turbines and are moved to areas where there is no risk of collision. The responsibility for designing and implementing these management measures lies with the company operating the wind farm.

- Active management of habitats under wind turbines: In cases where post-construction monitoring shows some effects (increased concentration or mobility of species on the site, collision incidents of certain species) on specific wind turbines, it is proposed to design active management measures for the areas under the wind turbines (creation of undesirable habitats for birds) after appropriate studies. These studies should necessarily consider other species of flora and fauna in the area that may be affected by the above management.
- Active management of habitats around the periphery of wind farms: in cases where a wind farm is in an area with a need for bird protection measures, active management of habitats around the periphery of the wind farm should be required to create suitable habitats that will attract birds away from the wind turbines. Such management actions could include, for example, ploughing and seeding of abandoned fields and clearing of forested fields after appropriate studies, so that species of interest likely to be affected by the wind farm are driven to safe alternative sites and indirectly favored. These studies should necessarily consider the potential impacts that will be assessed during the first period of operation of the wind farm and the other flora and fauna species in the area.
- Restoration of the surrounding area: Upon completion of construction, it is proposed to restore all unnecessary roads and disturbances to limit access to the area.
- Monitoring of potential impacts: there should be an explicit commitment to monitor the impacts of the park, particularly on bird species, for a period of at least two years after construction. The method of monitoring should meet specific standards to be defined by the relevant Ministry of Environment or advisory bodies, or as suggested by the international literature. It is proposed that monitoring be carried out by existing park staff, after training, in consultation with a team of experts (foresters, ornithologists), following a specific monitoring protocol. This will ensure the continuous collection of data, which can be made available to all stakeholders and interested parties.
- Possibility to interrupt or shut down wind turbines: Provision should be made for the occasional or seasonal interruption or permanent decommissioning of wind turbines that cause mortality based on monitoring data.
- Ministerial decision No. 8353/276/2012, which amends and supplements ministerial decision No. 37338/1807/2010, mentions the obligation to have an automated system for stopping wind turbines and activating deterrent devices in SPAs that have been classified as migratory passages.

Monitoring or counteracting/preventing the effects of impacts using contemporary technologies.

In recent years, the technology for monitoring and recording avifauna and flying fauna in general (including chiroptera) has developed significantly, resulting in the availability on the market of modern systems and methods that allow the collection of significant and higher quality and quantity of data compared to traditional recording methods, on the movements and use of airspace by flying fauna in general (including Chiroptera) and on the movements and use of airspace by flying fauna in general (including Chiroptera) and on the use of airspace by flying fauna in general (including Chiroptera) and on the use of airspace by flying fauna in general (including Chiroptera) and on the use of airspace by flying fauna in general (including Chiroptera) and on the use of airspace by flying fauna in general (including Chiroptera).

Emerging technologies in the field of monitoring and mitigation of the impacts of WPP projects fall into three main categories, which are:

A) Ornithological radar, B) Optical systems and C) Bioacoustic systems.

Technologies used include vibration sensors, acoustic sensors, visible spectrum cameras, infrared cameras, and radar. The available systems using these technologies are most useful during the operation of a project as they record incidents at the WPP and some also provide the ability to record the presence and use of the site by species found in the area. In combination with specific software, they can provide a real-time response capability that contributes to mitigation (e.g., automated wind turbine shutdown system, etc.). The main categories of new monitoring and mitigation technologies are presented below:

Ornithological radar

Ornithological radar could scan the surrounding airspace in 3D to record (a) the birds passing through the area, (b) the altitude at which they move, (c) the routes they follow. Radar systems vary and include either naval radars that scan parts of the airspace, automated naval or meteorological radars, or a combination of two or more radars in one system to scan the entire airspace. The system must be capable of continuously and simultaneously monitoring large numbers of birds over long distances and in low or zero visibility conditions. It also allows the vertical profile of bird and bat movements to be estimated, which is particularly useful for estimating nocturnal bird migration, where radar is the most powerful tool available. Mitigation in the case of bird radar is related to the immobilisation of one or more wind turbines where, based on radar information, there is an increased risk of collision. This requires real-time recording of the movement of flying fauna and decision-making on immobilisation.

This can be done by using one of the following methods:

- Automated ornithological radar system, which has software to make decisions based on whether birds are detected on a collision course and is directly linked to the SCADA to provide a stall command.

- Non-automated ornithological radar system, where recording and real-time decision making is carried out by field researchers. Communication for immobilization order is carried out with the wind farm operator at the control center.

Optical systems

Optical systems are based on high resolution image analysis and target recognition. These systems can provide visual coverage of the entire airspace around the wind turbine on which they are installed. Optical systems can be installed on the wind turbine tower without interfering with the tower, and with high resolution cameras to cover a 360° surveillance area around the wind turbine. These systems have a range of tens to hundreds of meters, depending on the size of the bird species being monitored. A system can typically cover one to three turbines, depending on the location of the wind farm and the type of turbines. The operation is continuous and powered by the wind turbine. The system allows monitoring of the airspace it covers during the day and under good visibility conditions. The detectability of flying fauna can be improved by adjusting the detection criteria based on additional information about the area in question. The system allows the monitoring of bird activity near wind turbines and can therefore be a complementary method to GPS telemetry and ornithological radar for determining flying fauna habitat use in wind farms. Monitoring is carried out using an automated recording system and the subsequent evaluation - processing of the video recordings collected, both for species identification and for the rejection of other flying targets such as aircraft and insects. Mitigation in the case of the use of an optical system is related to the repelling of birds and/or the immobilization of one or more wind turbines in cases where birds are on a collision course with them. This requires real-time recording of the movement of flying birds and immediate decision-making. This is accomplished using decision making software and directly connected to a SCADA system to activate the wind turbine immobilization, and for the repelling command it is connected to a loudspeaker system that emits sound signals of varying intensity depending on the estimated risk of impact.

Bioacoustic systems

Bat bioacoustic systems (bat detectors) are based on ultrasonic recording. A bat bioacoustic system, or bat detector, is a device used to detect the presence of bats by converting the ultrasonic signals emitted by the bats into acoustic frequencies, usually between 120 Hz and 15 kHz. The systems are typically mounted on the wind turbine, with the microphone at the base of the nacelle and the data acquisition system inside the turbine. The operation is continuous and powered by the wind turbine. The recorded data is stored in the recording unit inside the turbine. The systems can also be mounted on a meteorological mast prior to construction of the wind farm but can also be used as handheld systems. All bioacoustic systems require subsequent data processing by a handheld specialist to identify species. The system allows monitoring of the immediate rotor area of a wind turbine 24 hours a day, and the system can be adjusted to record only during the hours when bats are active. The monitoring is carried out using an automated recording system, and the data collected is later analyzed and processed by experts using a specialized handheld ultrasound processing program. Mitigation in the case of bio-acoustic systems is directly related to regulating the operation of wind turbines under certain temperature/wind conditions and at certain times of the year or shutting down certain wind turbines at certain times of the year, or possibly adjusting the starting speed, if technically feasible. Any intervention in the operation of the wind turbine requires the notification and consent of the wind turbine manufacturer.

New ultrasound technologies have been used as a mitigation tool to deter bats from wind turbines, thereby reducing mortality. Arnett et al (2013) provide evidence that broadband ultrasonic emissions can reduce bat mortality by deterring bats from approaching sound sources. The effectiveness of ultrasound deterrents studied at the time was limited by the distance and extent of the area where ultrasound could potentially be emitted, in part due to the rapid attenuation of ultrasound in humid conditions. Since then, more effective deterrents have been developed in the USA and will soon be commercially available.

Wind turbine blade painting with black color.

According to research conducted by the Norwegian Institute for Nature Research in 2020, the visibility of W/Ts to birds was investigated when one wing was painted black. The experiment took place at the Smøla wind farm in Norway, using the BACI (Before-After-Control-Impact) approximation method to look for collision mortality. The main species of interest at this site was the white-tailed eagle. This wind farm was commissioned in August 2005 and consists of 68 W/Ts (20 W/Ts of 2.1 MW and 48 W/Ts of 2.3 MW). In the first week of August 2013, one of the three W/T blades on 4 of the 2.1MW W/Ts was painted black due to a history of bird deaths caused by collisions. The neighbouring W/Ts were designated as control W/Ts for mortality surveys, even though dead birds had previously been recorded on them as well, so that the scientists/researchers could compare the results in similar spatial conditions.

As mentioned above, the BACI method was used to properly assess impacts. Dead bird tracking data was available from the beginning of 2006, 7.5 years prior to the start of this experiment, and 3.5 years up to the end of the project (end of 2016). Dead birds, including their feathers, were regularly tracked by trained dogs within a 100m radius of the W/Ts, as well as by staff and passers-by. The carcasses were usually found close to the W/T or on the maintenance roads. At the end of the experiment, it was observed that the number of recorded carcasses increased in the control W/Ts and decreased in those where handling was carried out. In addition, there was no effect on birds, which would be more likely to be affected in the adjacent control W/Ts. This was verified by comparing the annual mortality rates in the control W/Ts with the other W/Ts before and after the experiment.

Specifically, after dyeing, the annual mortality rate was reduced by an average of 71.9% compared to the control W/Ts. Additionally, the seasonal mortality rate of the dyed W/Ts decreased significantly in spring and autumn, while it increased in summer. Finally, this experiment was more effective on predators because they have higher visual acuity and sharp vision over long distances.

In conclusion, the application of modern technologies should be considered on a case-by-case basis, taking into account the characteristics of the wind project and the sensitivity of the area, the composition of the sensitive fauna and its ecological requirements, as well as the potential and limitations of each technology. During the operational phase of a wind farm, it is necessary to monitor and evaluate the effectiveness of the selected technologies throughout the lifespan of the project. At all stages of their design, operation and monitoring, the involvement of qualified experts is required to ensure their correct selection and siting, as well as to evaluate their effectiveness. The comparison and evaluation of data collected prior to the construction of the wind project and during its operation are important factors in assessing the potential impacts of the wind project on biodiversity. Continued development of these systems will help to optimise their operation in terms of the range and efficiency of the functions and services they provide, reduce their cost, minimise interference with wind turbine operation and optimise their performance in protecting flying fauna.

5. Preliminary Impact Assessment

This section presents all the necessary data to examine whether the described project, taking into account other similar projects in the area, may have a negative impact on the protected areas SPAs GR1110010 and Important Bird Area of Greece GR003, as well as in the neighboring protected areas SPAs GR1130011, GR1110002 and BG0002019, but also to the nearest Important Bird Area of Greece GR008 , in order to determine the need for further investigation of the impacts through the necessary due assessment.

Definition and description of the Study Area and the Field Investigation Area

As already mentioned in previous sections, the Wind Power Plant Pyramis Vrachou is of a nominal capacity of 34.5 MW, is to be installed in the Municipality of Soufli, in the Regional Unit of Evros, at the location " Pyramis Vrachou ", and is located within the Special Protection Zone GR1110010, as well as within the Important Bird Area of Greece GR003.

More specifically, the Wind Power Plant under study is located outside areas of absolute protection for nature, natural parks: national or regional parks, outside Special Conservation Zones (SCZs) and outside Protected Landscapes and Landscape Features or Protected Natural Formations. The proposed project is also situated outside National Parks and wetlands of international importance under the Ramsar Convention and outside the Conservation of Natural Monuments and Aesthetic Forests. The nearest National Park is the Forest of Dadia - Lefkimmi - Soufli National Park, whose closest border is approximately 20 km (in a straight line) to the southeast of the wind farm area under investigation. The planned project is also situated outside of National Parks and wetlands of global significance under the Ramsar Convention and outside of Nature Conservation Monuments and areas of natural beauty. Also, the project site is located outside the Landscapes of Special Natural Beauty (LSNBs). Finally, the project siting area is located outside Wildlife Sanctuaries, the closest of which is the Wildlife Sanctuary, Kechrou - Kerasias, the nearest boundary of which is located at an average distance (in a straight line) of more than 1,5 km (1,75 km) south of the area of the production license blocks of the Wind Power Plant under study.

In the following documentation maps section, all the above information is presented in relation to the location of the project in relation to Natura 2000 sites, National Parks, Wildlife Reserves, Important Bird Areas of Greece, as well as the field survey area, as defined by the relevant specifications of the Special Ecological Assessments for Category A2 projects and activities. A map showing the land cover patterns according to the Corine Land Cover 2018 mapping is also presented, showing the location of the wind farm polygons under study and the field survey area.

According to the Special Spatial Planning Framework for Renewable Energy Sources (SPF-RES) (Government Gazette 2464/B/03-12-2008), which was declared legal and valid by the decision of the E' Section of the Supreme Court of Justice No. 3 of Article 6, as replaced by Article 13 of Law 4296/2014 (Government Gazette 214 A/2-10-2014). "The siting of wind farms within the Special Protection Areas (SPAs) for Avifauna and Important Bird Areas (IBAs) is permitted by Article 10 of Ministerial Decision No. 4014/2011 Special Ecological Assessment (SEA) and on the basis of the relevant provisions of Ministerial Decision No. 170225/2014 (B'135) and Ministerial Decision 52983/1952/2013 (B' 2436) for the projects of categories A and B of Law4014/2011. The more specific conditions and restrictions for the implementation of the above-mentioned wind turbines are set out in the respective Decisions on the Approval of the Environmental Conditions for Projects of Category A' of Law No. 4014/2011 or on the Approval of the SEA for Projects of Category B of the same Law".

The study area is defined as the wider area of the Wind Power Plant Pyramis Vrachou installation, with the description and characteristics mentioned referring to all the protected characteristics of the areas of SPA GR1110010 and Important Bird Area of Greece GR003, while the protected characteristics of the nearest SPAs GR1130011, GR1110002 and BG0002019, as well as the nearest Important Bird Area of Greece GR008 were also considered. It is obvious that although the production license polygons of the wind farm under consideration, with an area of approximately 43.02 ha, are small compared to the 48,907.49 ha of the Special Protection Area GR1110010, and also compared to the Important Bird Area of Greece GR003, with an area of 48.873ha and is not expected to have a minimal impact on its values and protection purpose, however, the treatment of the area as a study area is considered to contribute to a more complete design of the present project due to the nature of the proposed project. It is emphasized that within the above 43.02 ha of the production license blocks of the wind farm under study, a much smaller intervention will be carried out.

The field survey area was defined as an area with a radius of 2,000 m (a radius four times larger than the one defined in the specifications for the preparation of SEA-170225/20.01.2014-FEK 135/B/27-01-2014, for projects and activities of category A2) from the boundaries of the project's production permit polygons, and in practice covers the entire mountainous volume of the project area. However, observations and records were made over a much larger radius, as raptors could be observed from vantage points at even more than 5,000 m (using a telescope).

EXISTING SITUATION OF THE NATURAL ENVIRONMENT

Recording and analysis of the elements of the natural environment

The study presents, analyses, and evaluates the specific characteristics and environmental conditions of the wider project area, based on data collected from both literature sources and field surveys of the study area. An assessment will also be made of the potential impact of the construction and operation of the Project on the conservation objectives of the Natura 2000 network sites SPA GR1110010, within which the Project is located, and the nearby SPAs GR1130011, GR1110002 and BG0002019, on the integrity of the sites and their protected objects (their designated species), due to the presence of large species of birds of prey, which, according to their ecology, are active over a wide radius and are able to cover the distance to the study area of this Project. In addition, the protected elements of the Important Bird Area of Greece GR003, within which the project under consideration is located as mentioned above, as well as the nearest Important Bird Area of Greece GR008 are also taken into consideration.

STUDY AREA

Summary description of areas GR1110010, GR1130011, GR111002, BG0002019 and Important Bird Area of Greece GR003 and GR008

The following is a brief description and identification of the areas defined as the study area in the context of this study (SPAs GR11100010, GR1130011, GR1110002 and BG0002019 and Important Bird Areas of Greece GR003 and GR008).

<u>Area identification (type, registration code, name)</u>

GR1110010

According to the region's standard data form (SDF) (https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=GR1110010)

Code: GR1110010

Site name: Oreinos Evros - Koilada Dereiou

Site category: Special Protection Area

GR1110002

According to the region's standard data form (SDF) (https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=GR1110002)

Code: GR1110002

Site name: Dasos Dadias- Soufli

Site category: Special Protection Area

GR1130011

According to the region's standard data form (SDF) (https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=GR11300011)

Code: GR1130011

Site name: Koilada Filiouri

Site category: Special Protection Area

BG0002019

According to the region's standard data form (SDF) (https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=BG0002019)

Code: BG0002019

Site name: Byala reka

Site category: Special Protection Area

GR003

According to the data of the Hellenic Ornithological Society, the following applies to this area as an Important Bird Area of Greece:

Code: GR003

Site name: Dadia-Dereio-Aisymi forest

Site category: Important Bird Area of Greece

GR008

According to the data of the Hellenic Ornithological Society, the following applies to this area as an Important Bird Area of Greece:

Code: GR008

Site name: Koilada Filiouri and eastern Rodopi mountains

Site category: Important Bird Area of Greece

Geographical definition of the areas (coordinates, altitude, surface area)

GR1110010

According to the region's standard data form (SDF) (http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=GR11100010)

Code: GR1110010

Longitude: 26.035000

Latitude: 41.202500

Total area (ha): 48.942,19

Region: Eastern Macedonia and Thrace

GR1130011

According to the region's standard data form (SDF) (https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=GR11300011)

Code: GR1130011

Longitude: 25.802500

Latitude: 41.222500

Total area (ha): 37.370,36

Region: Eastern Macedonia and Thrace

GR1110002

According to the region's standard data form (SDF) (http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=GR1110002)

Code: GR1110002

Longitude: 26.169700

Latitude: 41.114400

Total area (ha): 42 338,55

Region: Eastern Macedonia and Thrace

BG0002019

According to the region's standard data form (SDF) (https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=BG0002019)

Code: BG0002019

Longitude: 25.947222

Latitude: 41.391944

Total area (ha): 44,626,6460

Region: Yuzhen tsentralen

GR003

Based on the data of the Hellenic Ornithological Society, the following applies (https://www.ornithologiki.gr/el/oi-draseis-mas/diatirisi-erevna/simantikes-perioxes-gia-ta-poulia-tis-elladas/xartis-perioxon/GR003):

Longitude: 26º 1'49.738''E

Latitude: 41º 13'17.261''S

Altitude range: 0 - 1.065 meters

Total area (ha): 48,873 ha

Region: Eastern Macedonia and Thrace

Regional Units: Evros, Rodopi

GR008

Based on the data of the Hellenic Ornithological Society, the following applies (https://www.ornithologiki.gr/el/oi-draseis-mas/diatirisi-erevna/simantikes-perioxes-gia-ta-poulia-tis-elladas/xartis-perioxon/GR008):

Code: GR008

Longitude: 25º 41'34.680'' E

Latitude: 41º 13'3.491'' N

Altitude range: 0 - 1,195 meters

Total area (ha): 82,529 ha

Region: Eastern Macedonia and Thrace

Regional Units: Evros, Rodopi

Description of the general character of the site with simple reference to habitat types, habitat categories, quality and importance of the site, vulnerability, reasons for designation

As mentioned in the previous sections, the project site (wind turbine installation sites and associated works) is located within the Natura 2000 SPA GR1110010, but also within the Important Bird Area of Greece GR003. However, due to the nature of the proposed project and for the better drafting of this Special Ecological Assessment, the drafting team has chosen to assess the nearest SPAs GR1130011, GR1110002 and BG0002019, as well as the nearest Important Bird Area of Greece GR008

According to the description of the Important Bird Area of Greece GR003 (Hellenic Ornithological Society, Portolou et al. 2009) the wider area of the Wind Power Plant is located between the National Park of Dasos Dadia and Koilada Filiouri at the western end of Evros Prefecture. It is covered by oak and beech forests with small groups of pine trees and is crossed by the Diavolorema River. The central part and the north-east are dominated by partially forested areas with scattered old oak trees, used by free grazing livestock. The traditional agricultural activities of the local inhabitants (e.g., nomadic livestock farming, small-scale agriculture) have played a key role in the conservation of the ecosystems, maintaining sparse oak forests in part of the area. The mature oak trees that remain are used for pruning, i.e., collecting branches with leaves for goats to feed on in winter. Oak forests are also used for firewood production, while beech forests and pine reforestation are used for commercial timber.

According to Portolou and others (2009), the main threats to the designated species and the area in general are the abandonment of traditional land uses, intensive forest management and the use of toxic baits. Uncontrolled encroachment on streams can degrade important breeding and foraging areas for species such as Ciconia nigra and Clanga pomarina. The area is included in a Wind Priority Area (WPA 1) and the installation of wind farms is currently underway, threatening the avifauna of the area and the vultures in the neighboring National Park.

According to the website of the Hellenic Ornithological Society (https://www.ornithologiki.gr/el/oi-draseis-mas/diatirisi-erevna/simantikes-perioxes-gia-ta-poulia-tis-elladas/xartis-perioxon/GR003) and Portolou et al. (2009), the habitat types that make up the habitat mosaic of the area are as follows

- Artificial landscapes: 8.6 %
- Forests: 43.6%
- Grasslands: 9.1 %
- Scrubland: 38,5 %

Important Bird Area of Greece GR003, the area is important for breeding and migratory birds of prey and non-migratory species in forest, scrubland and rural areas and is vital for the feeding and survival of Aegypius monachus. According to the official website of the Hellenic Ornithological Society, the following species are defined as important for the area of the Important Bird Area of Greece GR003:

Table 4: *Important bird species for the study area*

(Source: https://www.ornithologiki.gr/el/oi-draseis-mas/diatirisi-erevna/simantikes-perioxes-gia-ta-poulia-tis-elladas/xartis-perioxon/GR003):

Latin name	**Common name**	**Latin name**	**Common name**
Ciconia nigra	Black Stork	*Jynx torquilla*	Eurasian wryneck
Falco naumanni	Lesser Kestrel	*Dendrocopos leucotos*	White-backed woodpecker
Falco vespertinus	Red-footed falcon	*Picus viridis*	European green woodpecker
Milvus milvus	Red kite	*Picus canus*	Grey-headed woodpecker
Neophron percnopterus	Egyptian vulture	*Hippolais olivetorum*	Olive-tree warbler
Aegypius monachus	Cinereous vulture	*Sylvia nisora*	Barred warbler
Circaetus gallicus	Short-toed Snake-Eagle	*Sylvia melanocephala*	Sardinian warbler
Circus macrouros	Pallid Harrier	*Syvlia cantillans*	Subalpine warbler

Latin name	Common name	Latin name	Common name
Clanga pomarina	Lesser spotted eagle	*Sitta neumayer*	Western rock nuthatch
Clanga clanga	Greater spotted eagle	*Oenanthe hispanica*	Western black-eared wheatear
Aquila heliaca	Eastern imperial eagle	*Ficedula semitorquata*	Semicollared flycatcher
Aquila chrysaetos	Golden eagle	*Emberiza caesia*	Cretzschmar's bunting
Hieraaetus pennatus	Booted eagle	*Emberiza melanocephala*	Black-headed bunting
Coracias garrulus	European roller		

Regarding the established SPA GR1110010, which is the main study area within which the project is located, according to the publication "Identification of compatible activities in relation to the species classification of the Special Protection Areas of avifauna, Supplementary deliverable: National List of Species Designation of Special Protection Areas" with the contracting authority being the Ministry of Environment and Natural Resources - Environmental Planning Directorate, Department of Natural Environment Management (Demaleksis 2010), and in accordance with Decision No. H.P.8353/276/E103 (Government Gazette 415/B/23-02-2012), the designated species are Aegypius monachus, Aquila pomarina (Clanga pomarina), Neophron percnopterus.

According to the Standard Data Forms of the area GR1110010, it is located at the western end of the prefecture of Evros, close to the Greek-Bulgarian border. The vegetation consists of oak and beech forests with small stands of pine. Wooded areas with scattered mature oak trees dominate much of the area, which is used for extensive forestry and livestock farming. The Diavolorema River runs through the area, creating areas of riparian vegetation and small rocky gorges.

In terms of the quality and importance of the SPA, this is a key area, for the breeding of predators and mountain forest species. It is vital for the feeding of the only black vulture population in Greece (which breeds in the neighbouring forest of Dadia).

The main threats listed in the Standard Data Forms of the Natura 2000 network site SPA GR1110010 are presented in Table 5 below.

Table 5. *Pressures and threats as reported in the standard data forms of the GR1110010 region (End 2018_15/03/2019) (https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=GR1110010)*

Codes	Pressures and threats	Classification	Within/Outside SPA
A02.03	Conversion of grassland to arable land	**Medium**	**Within**
A04.01	Intensive grazing	**Medium**	**Within**

Codes	Pressures and threats	Classification	Within/Outside SPA
A05.03	Lack of livestock farming	**Medium**	**Within/Outside**
A06.01.01	Intensive annual food crops / intensification	**High**	**Within**
A07	Use of biocides, hormones, and chemicals	**Medium**	**Within**
A09	Irrigation	**Medium**	**Within**
A10.01	Clearance of bushes and hedges	**Medium**	**Within**
B01	Afforestation of open areas	**Medium**	**Within**
B02.04	Removal of dead and old trees	**Medium**	**Within/Outside**
C01	Mining and quarrying	**Low**	**Outside**
C01.01	Sand and gravel extraction	**Low**	**Within**
C03.03	Wind energy production	**High**	**Within/Outside**
D01.01	Paths, cycle routes	**Low**	**Within**
D01.02	Roads and motorways	**Low**	**Within**
D02.01	Electricity transmission lines and telephone lines	**High**	**Within/Outside**
E01	Organisation and Human Settlements	**Low**	**Within**
E06	Other urbanisation, industrial and related activities	**High**	**Within/Outside**
F03.01	Hunting	**Low**	**Within**
F03.02.03	Trapping, poisoning, poaching	**High**	**Within/Outside**
G04.01	Military use and political unrest	**Low**	**Within**
G05	Other human interference and disturbance	**Low**	**Within**
K03.04	Captivity	**Medium**	**Within**

With regard to the established SPA GR1130011, which is located at a distance of less than 500 m, according to the publication "Identification of compatible activities in relation to the species classification of the Special Protection Areas of avifauna, Supplementary deliverable: National List of Special Protection Area designation species" with the contracting authority being the Ministry of Environment and Natural

Resources - Environmental Planning Directorate, Department of Natural Environment Management (Dimalexis 2010)", and in accordance with the decision no. Η. Π. 8353/276/Ε103 (Government Gazette 415/Β/23-02-2012), the species classified are Aegypius monachus, Aquila chrysaetos, Circaetus gallicus, Dendrocopos medius (Leiopicus medius), Dendrocopos syriacus, Emberiza bortulana, Ficedula semitorquata, Gyps fulvus, Lanius collurio and Neophron percnopterus.

According to the data given in the Standard Data Forms for the area GR1130011, this includes the catchment area of the Filiouri River and the surrounding hills south-east of the Rhodope Mountains. The area is dominated by oak forests and the land use is traditional extensive livestock farming and agriculture.

In terms of the quality and importance of the SPA, this is a prominent place for breeding and passage of predators and species associated with forest and bushland areas.

The main threats listed in the Standard Data Forms of the Natura 2000 network site SPA GR1130011 are presented in Table 6 below.

Table 6: *Pressures and threats as reported in the standard data forms of the GR1130011 region (End 2018_15/03/2019) (https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=GR1130011)*

Codes	Pressures and threats	Classification	Within/Outside SPA
A04.03	Abandonment of extensive livestock farming/lack of grazing	**Medium**	**Outside**
A05.03	Lack of livestock breeding	**Medium**	**Within**
A07	Use of biocides, hormones, and chemicals	**Medium**	**Within**
A10.01	Clearance of bushes and hedges	**High**	**Outside**
B02.02	Deforestation	**High**	**Within**
C03.03	Wind energy production	**High**	**Within/Outside**
H06.01	Noise nuisance (noise pollution)	**High**	**Within**
I02	Problematic native species	**Medium**	**Within/Outside**
K03.04	Predation	**High**	**Within**

Regarding the established SPA GR1110002, which is located at a distance of approximately 20 km, according to the publication "Identification of compatible activities in relation to the species classification of the Special Protection Areas of avifauna, Supplementary deliverable: National List of Special Protection Area Designation Species" with the contracting authority the Ministry of Environment and Natural Resources - Environmental Planning Directorate, Department of Natural Environment Management (Dimalexis 2010)", and in accordance with the decision no. H.P.8353/276/E103 (Government Gazette 415/B/23-02-2012), the species designated are Aegypius monachus, Aquila chrysaetos, Aquila clanga (Clanga clanga), Aquila pomarina (Clanga pomarina), Bubo bubo, Circaetus gallicus, Gyps fulvus, Hieraaetus pennatus, Hippolais olivetorum, Neophron percnopterus and Nycticorax nycticorax.

According to the data given in the Standard Data Forms of the area GR1110002, it is located at the south-eastern edge of the Rhodope Mountains and is a green hilly area with varied landscapes. A large part of the river Evros runs through the area. The vegetation consists of mixed stands of Pinus brutia, Pinus nigra and broad-leaved oaks, as well as other broad-leaved species of Mediterranean flora.

In terms of quality and importance, the SPA has significant ecological value due to the substantial number of bird species, many of which are rare in Europe. The area is an important habitat for many reptiles and birds because of its location, as it is a migratory corridor for many species but is also used as a nesting area for important species.

The main threats listed in the Standard Data Forms of the Natura 2000 network site ZEP GR1110002 are presented in Table 7 below.

Table 7: *Pressures and threats as reported in the standard data forms of the GR1110002 region (End 2018_15/03/2019) (https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=GR1110002)*

Codes	**Pressures and threats**	**Classification**	**Within/Outside SPA**
A04.03	Abandonment of extensive livestock farming/lack of grazing	**High**	**Outside**
A06.01.01	Intensive annual crops for food production / intensification	**Medium**	**Outside**
A06.01.01	Intensive annual crops for food production / intensification	**Low**	**Within**
A06.04	Abandonment of agricultural production	**High**	**Within**
A07	Use of biocides, hormones, and chemicals	**Medium**	**Outside**
A10	Reforestation	**Low**	**Outside**
A10.01	Clearance of bushes and hedges	**Medium**	**Outside**
B01	Afforestation of open areas	**Medium**	**Within**
B01.01	Afforestation of open areas with native species	**Low**	**Within**

Codes	Pressures and threats	Classification	Within/Outside SPA
B01.02	Artificial planting in open areas with non-native species	**Low**	**Outside**
B02.02	Deforestation	**Medium**	**Outside**
C01.01	Sand and gravel extraction	**High**	**Outside**
C03.03	Wind energy production	**High**	**Outside**
D01.02	Roads and motorways	**Low**	**Outside**
D02.01.01	Power and telephone lines	**Low**	**Within**
D02.01.01	Power and telephone lines	**Low**	**Outside**
F03.01	Hunting	**High**	**Outside**
F03.02	Poaching	**Medium**	**Outside**
F03.02.01	Collecting animals (insects, reptiles, amphibians)	**Medium**	**Within**
F03.02.02	Collecting eggs and destroying nests (e.g., collecting hawks' eggs)	**Low**	**Within**
F03.02.03	Trapping, poisoning, poaching	**High**	**Within/Outside**
G01.02	Hiking, horseback riding, and non-motorized vehicles	**Low**	**Within**
G04.01	Military exercises	**Medium**	**Within/Outside**
G05	Other human disorders and nuisances	**Low**	**Within**
J02.05	Modification of the hydrographic network (enclosing the bed of streams and rivers)	**Low / Medium**	**Within/Outside**
J03.01.01	Reduced availability of preys	**High**	**Within/Outside**
K04.01	Competition (flora)	**Medium**	**Within**
K04.02	Parasitism (flora)	**Medium**	**Within**
L09	Fire	**High**	**Within**

Regarding the neighboring Bulgarian Natura 2000 site BG0002019, according to the information provided in the standard NATURA data forms, the site covers the Byala

Reka catchment area in the south-eastern part of the Upper Rhodope, just next to the border with Greece. In addition to the Byala Reka valley, it includes the surrounding mountain hills from the village of Chernichevo in the west to the point where the river crosses the interstate border in the east. The vegetation of the area is quite diverse and is heavily influenced by the Mediterranean climate. Due to the low population density and the border status of the area, mature forests of Fagus sylvatica L. subsp. moesiaca and Quercus dalechampii have been preserved. Mixed oak forests of Q. dalechampii, Q. virgiliana, Q. frainetto and Q. pubescens, interspersed with patches of Carpinus orientalis, are also widespread. The area also consists of dry-thermal Mediterranean-type shrub formations, with considerable species diversity, dominated by Phyllirea latifolia and Juniperus oxycedrus, with the participation of Paliurus spina-christi, Fraxinus ornus, etc. (Bondev 1991). The river is deep, and its waters are not polluted. The riverbed is sandy-stony. Its banks are overgrown with willows and Salix spp. Arable land occupies a comparatively small part of the total area, around the settlements.

In terms of the quality and importance of the SPA, it hosts 167 bird species, 33 of which are included in the Red Data Book for Bulgaria (1985). Also, 46 bird species are included in Annex I of the Birds Directive with more than half of them breeding in the area. The area is of global importance as a permanent roosting and foraging site for the cinereous vulture (Aegypius monachus), as well as for breeding Annex I species of the Birds Directive such as the Black Stork (Ciconia nigra), the European honey buzzard (Pernis apivorus), the booted eagle (Hieraaetus pennatus), the short-toed snake eagle (Circaetus gallicus), the Levant sparrowhawk (Accipiter brevipes), the European nightjar (Caprimulgus europaeus), the olive-tree warbler (Hippolais olivetorum) and the red-backed shrike (Lanius collurio). Lastly, the woodlark (Lullula arborea) breeds in the area in significant numbers at European level.

The main threats listed in the Standard Data Forms of the neighboring Bulgarian Natura SPA BG0002019 are presented in Table 8 below.

Table 8. *Pressures and threats as reported in the standard data forms of the BG0002019 region (End 2021_07/02/2022) (https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=BG0002019)*

Codes	Pressures and threats	Classification	Within/Outside SPA
A01	Crops	**Low**	**Within**
A01	Crops	**Low**	**Outside**
A02	Modification of farming practices	**Low**	**Outside**
A02	Modification of farming practices	**Low**	**Outside**
A03	Mowing / cutting of grassland	**Medium**	**Within**
A03	Mowing / cutting of grassland	**Medium**	**Outside**
A04.03	Abandonment of extensive livestock farming/lack of grazing	**Medium**	**Within**
A08	Fertilizers	**Low**	**Within**
A08	Fertilizers	**Low**	**Outside**
A10	Reforestation	**Low**	**Within**
A10	Reforestation	**Low**	**Outside**
A10.01	Clearance of bushes and hedges	**Low**	**Outside**
A10.01	Clearance of bushes and hedges	**Low**	**Within**
B	Forestry	**Medium**	**Within**
B	Forestry	**Medium**	**Outside**
B02.02	Deforestation	**High**	**Within**
B02.02	Deforestation	**High**	**Outside**
B02.03	Removal of plants growing at the forest floor level	**Low**	**Within**
B02.03	Removal of plants growing at the forest floor level	**Low**	**Outside**
B02.04	Removal of dead and old trees	**Low**	**Within**
B02.04	Removal of dead and old trees	**Low**	**Outside**
B03	Exploitation of forests without replanting or natural regeneration	**Low**	**Within**

Codes	Pressures and threats	Classification	Within/Outside SPA
B03	Exploitation of forests without replanting or natural regeneration	**Low**	**Outside**
C01.01.01	Sand and gravel quarries	**Low**	**Within**
C01.01.01	Sand and gravel quarries	**Low**	**Outside**
C01.01.02	Sand sampling	**Low**	**Within**
C01.01.02	Sand sampling	**Low**	**Outside**
D01.01	Paths, cycle paths	**Medium**	**Within**
D01.01	Paths, cycle paths	**Medium**	**Outside**
D01.02	Roads and motorways	**Low**	**Within**
D01.02	Roads and motorways	**Low**	**Outside**
D02.01	Power and telephone transmission lines	**Low**	**Outside**
D02.09	Other forms of energy transport	**High**	**Outside**
D02.09	Other forms of energy transport	**Low**	**Within**
E03.01	Disposal of household waste and waste from recreational facilities	**High**	**Outside**
E03.01	Disposal of household waste and waste from recreational facilities	**High**	**Within**
E03.03	Disposal of aggregates	**Low**	**Outside**
E03.03	Disposal of aggregates	**Low**	**Within**
F02.03	Fishing	**Low**	**Within**
F02.03	Fishing	**Low**	**Outside**
F02.03.01	Illegal collection of bait	**Medium**	**Within**
F02.03.01	Illegal collection of bait	**Medium**	**Outside**
F03.01	Hunting	**Medium**	**Outside**

Codes	**Pressures and threats**	**Classification**	**Within/Outside SPA**
F03.01	Hunting	**Medium**	**Within**
F03.02	Illegal capture and removal of terrestrial fauna	**Medium**	**Within**
F03.02	Illegal capture and removal of terrestrial fauna	**Medium**	**Outside**
F03.02.01	Collecting animals (insects, reptiles, amphibians)	**High**	**Outside**
F03.02.01	Collecting animals (insects, reptiles, amphibians)	**High**	**Within**
F03.02.02	Collecting eggs and destroying nests (e.g., collecting hawks' eggs)	**Low**	**Outside**
F03.02.02	Collecting eggs and destroying nests (e.g., collecting hawks' eggs)	**Low**	**Within**
F03.02.03	Trapping, poisoning, poaching	**High**	**Within**
F03.02.09	Other forms of illegal taking/collection of fauna species	**Medium**	**Outside**
F03.02.09	Other forms of illegal taking/collection of fauna species	**Medium**	**Within**
F04	Illegal collection and removal of flora species	**High**	**Within**
F04	Illegal collection and removal of flora species	**High**	**Outside**
G01.03	Motor vehicles	**Low**	**Within**
G01.03	Motor vehicles	**High**	**Outside**
H	Pollution	**Medium**	**Outside**
H	Pollution	**Medium**	**Within**
H04	Air pollution, air pollutants	**Medium**	**Within**
H04	Air pollution, air pollutants	**Medium**	**Outside**
H05	Soil pollution and solid waste (excluding discharges)	**Medium**	**Outside**
H05	Soil pollution and solid waste (excluding discharges)	**Medium**	**Within**
J01	Fire and fire suppression	**Low**	**Outside**

Codes	Pressures and threats	Classification	Within/Outside SPA
J01	Fire and fire suppression	**Low**	**Within**
J02.05.02	Modification of inland water structures	**Medium**	**Within**
K01.01	Corrosion	**Medium**	**Within**
K01.01	Corrosion	**Medium**	**Outside**
L	Geological events, natural disasters	**Low**	**Outside**
L	Geological events, natural disasters	**Medium**	**Within**

Finally, as regards the area closest to the project, according to the description of the Important Bird Area of Greece GR008 (Hellenic Ornithological Society, Portolou et al. 2009), it includes the hills of the south-eastern Rhodopes and the valley of the river Filiouris. The dominant vegetation is maquis, with scattered stands of grazed oak (Quercus spp.). The isolation of this mountainous area has not allowed it to be developed (network of forest roads, other types of development and management interventions), so the character of the landscape has not yet been changed. The main land uses in the area remain traditional - extensive (agriculture, livestock farming) and contribute to the conservation of biodiversity. Only in recent years has some infrastructure (e.g., roads) been developed to serve the local population.

The area is important for breeding and migratory raptors and species associated with forests and scrub. The species Gypaetus barbatus used to breed in the area.

The main threats identified in the area are increased road construction, intensified forest exploitation (deforestation, removal of mature and dead trees), poaching, the placement of poisoned bait, which is a significant problem for scavenging predators, and local overgrazing. The planned installation of many wind farms in the area is expected to have an impact on breeding predators and migratory species passing through the area, as well as Aegypius monachus using the area for foraging. A considerable number of wind turbines have already been installed on the eastern side of the site.

According to the website of the Hellenic Ornithological Society (https://www.ornithologiki.gr/el/oi-draseis-mas/diatirisi-erevna/simantikes-perioxes-gia-ta-poulia-tis-elladas/xartis-perioxon/GR008) and Portolou et al. (2009), the habitat types that make up the habitat mosaic of the area are as follows:

- Artificial landscapes: 19.6%
- Forests: 36,6 %
- Grassland/pasture: 6 %
- Scrubland: 33,6 %
- Rocky areas: 3.8%
- Wetlands (inland areas): 0.1%

Detailed description of the Study Area (S.A.)

The following sections provide a description of the elements of the natural environment of the Study Area with emphasis on the protected features of the areas that may be affected by the construction and operation of the project under consideration. The most recent literature data were considered for the recording of these data.

Recording of the habitat types of Annex I of H.P.14849/853/E103/4.4.2008 (Government Gazette B' 645), in terms of the relevant area (if it is a Special Area of Conservation (SAC), Sites of Community Importance (SCI) or proposed Sites of Community Importance (pSCI).

The study area is not a SAC, SCI and therefore there is no habitat type mapping in Appendix I of this Ministerial Decision. The surrounding land uses recorded in the project area are listed in the relevant subsections according to the 2018 Corine Land Use Cover 2018 Land Use Mapping.

Inventory of the flora and fauna species listed in Annex II of Ministerial Decision H.P. 14849/853/E103/4.4.2008 (B' 645), with reference to the size and density of the populations, their conservation status, and their isolation (if they are in SACs, SCIs or pSCIs).

The study area is not an SAC, SCI and therefore there is no record of the flora and fauna species listed in Annex II of the said Ministerial Decision. The fauna species recorded during the fieldwork in the wider project area are listed in a similar subchapter.

Inventory of the avifauna species listed in Annex I to Ministerial Decision 37338/1807/E.103 (B' 1495), as well as other migratory bird species with a significant presence in the Natura 2000 site, with reference to the size and density of populations, their conservation status, and their isolation (if located in an SPA).

Based on the data of the Important Bird Area of Greece GR003, according to the Hellenic Ornithological Society and Portolou and others (2009), the avifauna species with significant presence in the area, especially in terms of population size and density, conservation status and isolation, are presented in Table 9 below (the species with data in the 2000 criteria column are the characterizing species of the area).

Table 9. *Species of avifauna of the area listed in the Ornithological Society Data Sheet and Portolou et al. (2009) for the Important Bird Area of Greece GR003, population estimates and criteria (source: https://www.ornithologiki.gr/el/oi-draseis-mas/diatirisi-erevna/simantikes-perioxes-gia-ta-poulia-tis-elladas/xartis-perioxon/GR003 , Portolou et al. 2009).*

Species	Year	Status of presence	Abundance	Minimum population	Maximum population	Unit of measurement	Data precision	2000 criteria
Ciconia nigra	2004	B		4	6	P	A	
Falco naumanni	2004	P	P				P	
Falco vespertinus	-1997	P	C				U	
Milvus milvus	-1997	P	U				U	
Neophron percnopterus	2004	B		2	3	P	A	B2, C6
Aegypius monachus	2004	non-B	C		0		A	A1, C1
Cicraetus gallicus	2004	B		8	10	P	A	
Circus macrourus	2004	P	P				P	
Aquila pomarina	2004	B		4	6	P	A	B2, C6
Aquila clanga	-1997	P	U				U	
Aquila heliaca	-1997	P	U				U	
Aquila chrysaetos	2004	R		4	5	P	A	
Hieraaetus pennatus	2004	B		3	6	P	A	
Coracias garrulus	-1997	B	F				B	
Jynx torquilla	-1997	B	C				B	
Dendrocopos leucotos	-1997	R	U				C	
Picus viridis	-1997	R	A				A	B2
Picus canus	-1997	R	F				B	
Hippolais olivetorum	-1997	B	U				B	A3
Sylvia nisoria	-1997	B	U				B	
Sylvia melanocephala	-1997	R	F				A	A3
Sylvia cantillans	-1997	B	C				A	A3

Species	Year	Status of presence	Abundance	Minimum population	Maximum population	Unit of measurement	Data precision	2000 criteria
Sitta neumayer	-1997	R	P				U	A3
Oenanthe hispanica	-1997	B	C				B	A3
Ficedula semitorquata	-1997	B	P				U	B2, C6
Emberiza caesia	-1997	B	F				B	A3
Emperiza melanocephala	-1997	B	F				B	A3
Neophron percnopterus	2012-2018	B		0	1	P	A	
Aquila chrysaetos	2010-2018	B		7	7	P	A	

Legend explaining the criteria.

CATEGORY	CRITERION
A. Areas of global importance	
A1. Globally threatened species	The site regularly supports significant numbers of a globally threatened species, or another species in need of global protection
A2. Species of limited distribution	The site is known or believed to support a considerable proportion of a species of restricted distribution whose breeding distribution defines an EBA (Endemic Bird Area) or SA (Secondary Area)
A3. A group of species whose distribution is restricted to one type of habitat (biome)	The area is known, or is thought to support a sizable portion of a group of species whose distributions are predominantly or completely restricted to a biome
A4. Concentrations	(i) The area is known or believed to support on a regular basis more than 1% of a biogeographic population of an aquatic species (ii) The area is known or believed to support on a regular basis more than 1% of the global population of a seabird or terrestrial species (iii) The area is known or believed to support on a regular basis more than 20,000 waterbirds, or 10,000 pairs of seabirds of one or more species.
B. Areas of European importance	(iv) The area is known, or is believed to exceed population limits established for migratory species
B1. Concentrations	(i) The area is known to support or is believed to support more than 1% of a flying or other distinct population of an aquatic species (ii) The area is known or believed to support more than 1% of the discrete population of a seabird. (iii) The area is known or believed to support more than 1% of a flight path or other distinct population of another wildlife species (iv) An area through which more than 5,000 storks or 3,000 raptors or cranes regularly pass during spring or fall migration

B2. Species with an unfavorable conservation status in Europe (SPEC 1, 2 and 3)	The site is one of the "ns" most important in the country for a species with an unfavorable conservation status in Europe (SPEC 1, 2 and 3), for which a site-based approach is considered appropriate
B3. Species with favorable conservation status but concentrated in Europe (SPEC 4)	The site is one of the "ns" most important in the country for a species with a favorable conservation status in Europe (SPEC 4), for which a site-based approach is considered appropriate

C. Areas of importance in the European Union For species or subspecies listed in Annex I of the Community Birds Directive	C1. The site regularly supports significant numbers of globally threatened species, or another species in need of global protection. C2. The site is known to support at least 1% of a flyway or population size in the EU of a threatened species. C3. The site is known to support at least 1% of a flyway of another migratory species. C4. The site is known to maintain on a regular basis at least 20,000 migratory waterfowl, or 10,000 pairs of seabirds of one or more species. C5. Area where more than 5,000 Stork, or 3,000 migratory raptors or Cranes regularly pass-through during spring or fall migration. C6. The area is one of the 5 most important in a European region for a species or subspecies considered threatened in the European Union C7. The site has been designated as an SPA, or has been selected as a candidate SPA based on ornithological

Based on the data of the Important Bird Area of Greece GR008, according to the Hellenic Ornithological Society and Portolou et al. (2009), the avifauna species found in the area with significant presence, especially in terms of population size and density, conservation status and isolation, are presented in Table 10 below (species with data in the 2000 criteria column are the species characterizing the area).

Table 10. *Species of avifauna of the area listed in the Ornithological Society Data Sheet and Portolou et al. (2009) for the GR008 SPA, population estimates and criteria (source: https://www.ornithologiki.gr/el/oi-draseis-mas/diatirisi-erevna/simantikes-perioxes-gia-ta-poulia-tis-elladas/xartis-perioxon/GR008 , Portolou et al. 2009).*

Species	Year	Status of presence	Abundance	Minimum population	Maximum population	Unit of measurement	Data precision	2000 criteria
Ciconia nigra	2000-4	B	F				C	
Falco naumanni	1995	P	F				B	
Falco vespertinus	2000-4	P	C				B	
Neophron percnopterus	2000-4	B		2	3	P	B	B2,C6
Gyps fulvus	2000-4	B		0	0	P	A	C6
Aegypius monachus	2007	non-B		8	0	I	C	A1,C1
Cicraetus gallicus	1995	B		10	0	P	B	B2,C6
Circus macrourus	1995	P	U				B	
Aquila pomarina	2000-4	B		2	3	P	C	
Aquila heliaca	2004	U		2	2	I	A	
Aquila chrysaetos	2000-4	R		1	2	P	C	C6
Hieraaetus pennatus	2000-4	B	P				C	
Strix aluco	1992	R	F				B	B3
Coracias garrulus	1995	B	F				B	
Dendrocopos medius	1995	R	C				B	C6
Dendrocopos syriacus	1995	R	C				B	B3,C6

Species	Year	Status of presence	Abundance	Minimum population	Maximum population	Unit of measurement	Data precision	2000 criteria
Lanius collurio	1995	B	C				B	B2,C6
Phylloscopus bonelli	1995	B	C				B	B3
Sylvia hortensis	1993	B	U				B	B2
Ficedula semitorquata	1990	B	R				C	B2,C6
Emberiza hortulata	1995	B	C				B	B2,C6
Gyps fulvus	2016	B		1	1	P	A	
Neophron percnopterus	2012-2018	B		0	1	P	A	
Aquila chrysaetos	2010-2017	B		3	3	P	A	

With regard to the established SPAs GR1110010 (in which the wind farm under study is located) and GR1130011, GR1110002 and BG0002019, which are protected areas of the Natura network, all the important species of Article 4 of Directive 2009/147/EK (Annex I species, etc.) of the Natura sites, with all the recorded information on their population data, conservation status, etc., as well as other important species of the avifauna of the sites, are presented in Tables 11, 12, 13 and 14, as listed in the standard data forms of the sites.

At this point it is worth noting that the most important bird species of the above Greek SPAs are presented, as they are described in the 2019 edition of their Standard Data Forms (SDF) (End 2018_15/03/2019). The reason why the team of the present monitoring project chose not to take into account the revised version of the SDFs consists both in the fact that the latter is included in full, without the slightest difference, in the version (2019) chosen, and in the existence of large birds of prey that, according to their ecology, are active over a large radius, capable of covering the distance to the study area. These important birds of prey (e.g. Aquila chrysaetos, Clanga pomarina, Aegypius monachus, Gyps fulvus, Neophron percnopterus, Aquila heliaca, Buteo rufinus, Milvus migrans, Hieraaetus pennatus, Aquila fasciata, Circus pygarcus, Falco biarmicus, Falco naumanni) for which the above areas, as mentioned in previous subsections of this report, are very important, are not included in the latest version of the TAPs for the areas. Also, most of these birds of prey are also designated species of the above study areas. Also, important Annex I species of Directive 2009/147/EC, such as Ciconia nigra, Ciconia ciconia etc. are not mentioned.

The most important species of avifauna of the SPA GR1110010 are presented below, as described in the 2019 version of the Standard Data Form (SDF):

Table 11. *Standard data forms of the GR1110010 area (End 2018_15/03/2019).*

(https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=GR1110010)

Species					**Population in the site**						**Site assessment**			
G	**Code**	**Scientific Name**	**S**	**NP**	**T**	**Size**		**Unit**	**Cat.**	**D.qual.**	**A|B|C|D**	**A|B|C**		
						Min	**Max**				**Pop.**	**Con.**	**Iso.**	**Glo.**
B	**A402**	*Accipiter brevipes*			r				P		C	A	B	B
B	**A223**	*Aegolius funereus*			p				P		B	A	B	B
B	**A079**	*Aegypius monachus*			p	4	4	i			A	B	B	B
B	**A247**	*Alauda arvensis*			c	43	43	i/sq.km			D			
B	**A229**	*Alcedo atthis*			p				P		C	B	C	B
B	**A255**	*Anthus campestris*			r				P		C	B	C	B
B	**A228**	*Apus (Tachymarptis) melba*			r				P		C	B	C	B
B	**A226**	*Apus apus*			r				P		C		C	B
B	**A091**	*Aquila chrysaetos*			p	4	5	i			B	B	C	B
B	**A090**	*Aquila clanga*			c				P		C	B	B	B
B	**A404**	*Aquila heliaca*			c				P		B	B	B	B
B	**A089**	*Aquila pomarina*			r	4	6	i			B	B	B	B
B	**A699**	*Ardea cinerea cinerea*			c				P		C	B	C	B
B	**A215**	*Bubo bubo*			p	2		p			C	A	C	B
B	**A087**	*Buteo buteo*			r	7	7	p			C	A	C	B
B	**A403**	*Buteo rufinus*			c				P		C	B	B	B
B	**A243**	*Calandrella brachydactyla*			r				P		C	C	C	C
B	**A224**	*Caprimulgus europaeus*			r				C		C	A	C	B
B	**A667**	*Ciconia ciconia ciconia*			c				P		C	B	C	B
B	**A030**	*Ciconia nigra*			r	4	6	i			B	B	B	B
B	**A080**	*Circaetus gallicus*			r	8	10	i			B	A	C	B
B	**A081**	*Circus aeruginosus*			c				P		C	B	C	B
B	**A082**	*Circus cyaneus*			c				P		C	A	C	B
B	**A083**	*Circus macrourus*			c				P		C	B	B	B
B	**A084**	*Circus pygargus*			c				P		C	B	C	B
B	**A231**	*Coracias garrulus*			r	19	19	i/sq.km			C	B	C	B
B	**A113**	*Coturnix coturnix*			r				P		C	B	C	B
B	**A212**	*Cuculus canorus*			c				C		C	B	C	B
B	**A212**	*Cuculus canorus*			r				P		C	B	C	B
B	**A738**	*Delichon urbicum (urbica)*			r				C		C	B	C	B
B	**A239**	*Dendrocopos leucotos*			p				P		C	A	B	B
B	**A238**	*Dendrocopos medius*			p				P		C	B	C	B
B	**A429**	*Dendrocopos syriacus*			p	11	11	i/sq.km			C	A	B	B
B	**A236**	*Dryocopus martius*			p				P		C	B	B	B
B	**A697**	*Egretta garzetta garzetta*			c				P		D	B		
B	**A447**	*Emberiza caesia*			r				P		C	C	C	B

Species					Population in the site						Site assessment			
G	**Code**	**Scientific Name**	**S**	**NP**	**T**	**Size**		**Unit**	**Cat.**	**D.qual.**	**A|B|C|D**	**A|B|C**		
						Min	**Max**				**Pop.**	**Con.**	**Iso.**	**Glo.**
B	**A379**	*Emberiza hortulana*			r				P		C	A	C	B
B	**A098**	*Falco columbarius*			c				P		C	B	C	B
B	**A100**	*Falco eleonorae*			c				P		C	B	B	B
B	**A095**	*Falco naumanni*			c				P		C	B	C	B
B	**A709**	*Falco peregrinus brookei*			p				P		C	B	C	B
B	**A097**	*Falco vespertinus*			c				P		C	B	C	B
B	**A321**	*Ficedula albicollis*			c				P		C	A	C	B
B	**A320**	*Ficedula parva*			c				P		C	B	C	B
B	**A442**	*Ficedula semitorquata*			r				P		C	B	C	B
B	**A076**	*Gypaetus barbatus*			c				V		D	B		
B	**A078**	*Gyps fulvus*			c				P		C	B	C	B
B	**A078**	*Gyps fulvus*			w				P		C	B	C	B
B	**A707**	*Hieraaetus fasciatus (Aquila fasciata)*			c				P		C	B	B	B
B	**A092**	*Hieraaetus pennatus (Aquila pennata)*			r	3	6	p			B	B	C	B
B	**A439**	*Hippolais olivetorum*			r				P		C	B	C	B
B	**A251**	*Hirundo rustica*			r	61	61	i/sq.km			C	B	C	B
B	**A233**	*Jynx torquilla*			r				P		C		C	B
B	**A338**	*Lanius collurio*			c	53	53	i/sq.km			C	B	C	B
B	**A338**	*Lanius collurio*			r				C		C	B	C	B
B	**A339**	*Lanius minor*			r				P		C	B	C	C
B	**A433**	*Lanius nubicus*			r				P		C	B	C	B
B	**A246**	*Lullula arborea*			p				P		C	A	C	B
B	**A242**	*Melanocorypha calandra*			r				P		C	B	C	B
B	**A230**	*Merops apiaster*			r				P		C	B	C	B
B	**A073**	*Milvus migrans*			**c**				P		C	B	C	B
B	**A074**	*Milvus milvus*			c				P		B	A	B	B
B	**A260**	*Motacilla flava*			c				P		C	A	C	B
B	**A260**	*Motacilla flava*			r				P		C	A	C	B
B	**A077**	*Neophron percnopterus*			r	2	3	p			B	B	C	B
B	**A533**	*Oenanthe pleschanka*			r				P		C	C	C	C
B	**A337**	*Oriolus oriolus*			c				P		C	A	C	B
B	**A337**	*Oriolus oriolus*			r				P		C	A	C	B
B	**A094**	*Pandion haliaetus*			c				P		C	C	C	B
B	**A771**	*Passer hispaniolensis*			p				C		C	B	C	B
B	**A072**	*Pernis apivorus*			r	8	10	i			C	A	C	B
B	**A234**	*Picus canus*			p				P		C	B	C	B
B	**A210**	*Streptopelia turtur*			c				P		C	B	C	B

Species					Population in the site						Site assessment			
G	**Code**	**Scientific Name**	**S**	**NP**	**T**	**Size**		**Unit**	**Cat.**	**D.qual.**	**A|B|C|D**	**A|B|C**		
						Min	**Max**				**Pop.**	**Con.**	**Iso.**	**Glo.**
B	**A210**	*Streptopelia turtur*			r				C		C	B	C	B
B	**A307**	*Sylvia nisoria*			r				P		B	B	B	B
B	**A282**	*Turdus torquatus*			c				P		C	B	B	B

Other important species in the area are based on the same source.

Species					Population in the site				Motivation					
G	**CODE**	**Scientific Name**	**S**	**NP**	**Size**		**Unit**	**Cat.**	**Species Annex**		**Other categories**			
					Min	**Max**		**C|R|V|P**	**IV**	**V**	**A**	**B**	**C**	**D**
B	**A726**	*Charadrius dubius curonicus*			10	16	i				X			
B	**A726**	*Charadrius dubius curonicus*			10	16	i						X	
B	**A726**	*Charadrius dubius curonicus*			10	16	i							X
B	**A211**	*Clamator glandarius*						P			X			
B	**A211**	*Clamator glandarius*						P					X	
B	**A207**	*Columba oenas*						P			X			
B	**A207**	*Columba oenas*						P					X	
B	**A207**	*Columba oenas*						P						X
B	**A687**	*Columba palumbus palumbus*						P			X			
B	**A687**	*Columba palumbus palumbus*						C			X			
B	A687	*Columba palumbus palumbus*						P						X
B	**A687**	*Columba palumbus palumbus*						C						X
B	**A435**	*Oenanthe isabellina*						P			X			
B	**A435**	*Oenanthe isabellina*						P					X	

Memorandum to Tables 11, 12, 13 and 14

- **Group: A** = amphibians, B = birds, F = fish, I = invertebrates, M = mammals, P = plants, R = reptiles
- **S:** in case the species data are sensitive and should therefore be excluded from any public access insert: yes
- **NP:** in case a species no longer exists on the site enter: x (optional)

- Type: p = permanent, r = breeding, c = aggregation, w = winter (for plants and non-migratory species use permanent)

- Unit: i = individuals, p = pairs or other units according to the standard list of population units and codes according to Articles 12 and 17

- Abundance categories (Cat.): C = common, R = rare, V = very rare, P = present - to be completed if data are insufficient (DD) or in addition to information on population size

- Data quality: G = 'Good' (e.g. based on surveys), M = 'Moderate' (e.g. based on partial data with some extrapolation), P = 'Poor' (e.g. rough estimation), VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

- Population: Size and density of the species in the area in relation to the total population within the national boundaries. A: 100%>=p> 15%, B: 15%>=p>2%, C: 2%>=p>0.

- Conservation: Degree of protection of the habitat that is important for the species and its potential for restoration. A: Excellent conservation, B: Good conservation, C: Moderate or degraded.

- Isolation: Degree of isolation of the population occurring in the area in relation to the natural distribution of the species. A: Isolated (almost) population, B: Non-isolated population, but located at the edge of the range, C: Non-isolated population, with a wide distribution.

- Global assessment: Overall conservation value of the area for the species. A: Excellent, B: Good, C: Adequate.

- Motivation categories: IV, V: Annex species (Habitats Directive), A: Species included in the Greek Red Data Book, B: Endemic species, C: Species protected by international conventions, D: Other reasons

As shown in Table 11 above, detailed population data for the GR1110010 site are limited and for most species the information available is an estimate of their presence on the site (present, common, rare, very rare). Population data are available for Aegypius monachus, Alauda arvensis, Aquila chrysaetos, Aquila pomarina (Clanga pomarina), Bubo bubo, Buteo buteo, Ciconia nigra, Circaetus gallicus, Coracias garrulus, Dendrocopos syriacus, Hieraaetus pennatus, Hirundo rustica, Lanius collurio, Neophron percnopterus and Pernis apivorus. The 15 species listed above include the three species proposed for this Natura site (Aegypius monachus, Aquila pomarina (Clanga pomarina) and Neophron percnopterus) and, of the total, Aegypius monachus, Aquila chrysaetos, Aquila pomarina (Clanga pomarina, Bubo bubo, Ciconia nigra, Circaetus gallicus, Coracias garrulus, Dendrocopos syriacus, Hieraaetus pennatus, Lanius collurio, Neophron percnopterus and Pernis apivorus are avifauna species listed in Annex I to Directive 2009/147/EK, Alauda arvensis is an avifauna species listed in Annex II to that Directive, while two of them (Buteo buteo and Hirundo rustica) are not included in those Annexes.

During the reference period for the area, the conservation status of most species was assessed as good (B) to excellent (A), except for Calandrella brachydactyla, Emberiza caesia, Oenanhe pleschanka and Pandion haliaetus, for which the conservation status was assessed as moderate or degraded (C), and Jynx torquilla, Apus apus and Alauda arvensis, for which the conservation status was not assessed. For the characterization species Aquila pomarina (Clanga pomarina) and Neophron percnopterus, the area supported 2-15% of the Greek population (population criterion B), while for the characterisation species Aegypius monachus the area supported more than 15% of the Greek population (population criterion A). For the majority of species, except for the above characterisation species, the area supported 0-2% of the Greek population (population criterion C), with the species Aegolius funereus, Aquila chrysaetos, Aquila heliaca, Ciconia nigra, Circaetus gallicus, Hieraaetus pennatus, Milvus milvus and Sylvia nisoria occurring with population criterion B (the area supported 2-15 % of the Greek population), Alauda arvensis, Egretta garzetta and Gypaetus barbatus occurring with population criterion D (the area supported a non-significant population).

Also, according to the "Ornithological Assessment Report of the area "GR003 Dasos Dadia - Derio - Aisymi", for its designation as a Special Protection Area. Ministry of Environment, Spatial Planning and Public Works, Athens, and Greek Biotope/Wetland Centre, Thermi. p. 31+ ii annexes." (Poirazidis 2005), species of delimitation for the area are Ciconia nigra, Aquila chrysaetos, Circaetus gallicus and Hieraaetus pennatus, as according to the above report, the area maintains, on a national level, a significant population of these species. According to the above source, for the species Ciconia nigra the region supports more than 4 % of the national population, for the species Circaetus gallicus the region supports more than 2 % of the national population, for the species Aquila chrysaeotos the region supports 3-4% of the national population and for the species Hieraaetus pennatus the region supports 6 % of the national population.

According to the information mentioned in the Red Book of Endangered Animals of Greece, the vulture is now found only in Crete (Legakis and Marangou 2009): 'The vulture is the rarest species of vulture in Greece, and, unlike the others, it maintains territories and does not form colonies. In the past the vulture was a common species with a wide distribution and in the 1970s it spread to all the mountain ranges of the mainland and Crete, with a population estimated at 25 pairs (Handrinos 1985).

In the mid-1990s the first population decline (12-18 pairs) was observed, coinciding with the reappearance of the wolf (Canis lupus) in several mountains of Sterea and Thessaly and the illegal use of poisoned baits for its control (Tucker and Heath 1994; Handrinos and Akriotis 1997, Sakoulis 2000). This downward trend continued throughout the 1990s, resulting in an 84% decline in the vulture population and a 75% decline in its distribution. In the mid-1990s, 4 pairs were left in Crete and a single individual in the mountain arc of Aridaia (Jena-Pinovo) in western Macedonia (Xirouchakis et al. 2001). Today the vulture is found only in Crete, with 4-6 pairs, which is the only breeding population in southeastern Europe, except Turkey (BirdLife International 2004; Xirouchakis and Tsiakiris 2008). The total population in Crete does not exceed 30 individuals, of which about 1/3 are immature (Xirouchakis and Tsiakiris 2008). A key characteristic of this population is the high number of dominations with solitary mature individuals (61%), as well as the early reproduction of sub-mature individuals, both examples of lack of adults due to high mortality (Xirouchakis and Grivas 2002).".

Also, according to the Red Book of Endangered Animals of Greece, the king eagle is no longer breeding in Greece, while it 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, L. Kerkini, Kalamas Delta etc.), while a few individuals, mainly juveniles, migrate south in autumn along the Ionian coast (Messolonghi, western Peloponnese etc.) (Chandrinos 1992, Handrinos and Akriotis 1997, EOE data) (Legakis and Maragou 2009): "Common in Greece and widely distributed species in the pre-war years and until the 1960s, 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 nests (Handrinos and 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, in the large wetlands of northern Greece (Evros Delta, L. Kerkini, Kalamas Delta, etc.). A few individuals, juveniles, migrate south in autumn along the Ionian coast (Messolonghi, Western Peloponnese, etc.) (Chandrinos 1992; Handrinos and Akriotis 1997; EOE data). There are 10 recoveries in Greece of ringed individuals in Hungary (5), Slovakia (4) and Bulgaria (Akriotis and Chandrinos 2004).

Although, as already mentioned, the site of the project is located outside the Natura site GR1130011, the most important species of the avifauna of the SPA, as described in the 2019 edition of the Standardized Data Form (SDF), are presented below:

Table 12. *Standard data forms of the GR1130011 area (End 2018_15/03/2019). (http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=GR1130011)*

Species					**Population in the site**						**Site assessment**			
G	**Code**	**Scientific Name**	**S**	**NP**	**T**	**Size**		**Unit**	**Cat.**	**D.qual.**	**A|B|C|D**	**A|B|C**		
						Min	**Max**				**Pop.**	**Con.**	**Iso.**	**Glo.**
B	A402	*Accipiter brevipes*			r	2		p		M	C	A	B	B
B	A079	*Aegypius monachus*			c				C	DD	B	B	A	A
B	A229	*Alcedo atthis*			p				P	DD	C	B	C	B
B	A255	*Anthus campestris*			r				P	DD	C	A	C	B
B	A226	*Apus apus*			r				p	DD	C	B	C	C
B	A091	*Aquila chrysaetos*			p	1	1	p		G	C	B	C	B
B	A404	*Aquila heliaca*			c				R	DD	A	B	B	A
B	A089	*Aquila pomarina*			r	1	1	p		G	B	B	B	A
B	A215	*Bubo bubo*			p	1	1	p		G	C	A	C	B
B	A087	*Buteo buteo*			r	2	2	p		G	C	A	C	C
B	A403	*Buteo rufinus*			p				P	DD	C	B	B	B
B	A224	*Caprimulgus europaeus*			r				C	DD	C	A	C	B
B	A667	*Ciconia ciconia ciconia*			c				P	DD	C		C	B
B	A030	*Ciconia nigra*			r				P	DD	B	B	B	B
B	A080	*Circaetus gallicus*			r				C	DD	B	A	C	B
B	A081	*Circus aeruginosus*			c				P	DD	C	B	C	B
B	A082	*Circus cyaneus*			c				P	DD	C	A	B	B
B	A083	*Circus macrourus*			c				R	DD	C	B	C	B
B	A084	*Circus pygargus*			c				P	DD	C	B	C	B
B	A231	*Coracias garrulus*			r				P	DD	C		C	B
B	A738	*Delichon urbicum (urbica)*			c				p	DD	C	B	C	B
B	A738	*Delichon urbicum (urbica)*			r				p	DD	C	B	C	C
B	A238	*Dendrocopos medius*			p				C	DD	C	B	C	B
B	A429	*Dendrocopos syriacus*			p				C	DD	C	A	C	B
B	A236	*Dryocopus martius*			p				p	DD	C	B	C	B
B	A379	*Emberiza hortulana*			r				C	DD	C	A	B	B
B	A100	*Falco eleonorae*			c				P	DD	C	B	C	B
B	A095	*Falco naumanni*			c				P	DD	C		C	B
B	A709	*Falco peregrinus brookei*			p				R	DD	C	A	C	B
B	A321	*Ficedula albicollis*			c				P	DD	C	A	C	B
B	A320	*Ficedula parva*			c				C	DD	C		C	B
B	A442	*Ficedula semitorquata*			r				R	DD	B		B	A
B	A076	*Gypaetus barbatus*			p				R	DD	B	B	B	A
B	A078	*Gyps fulvus*			p	13	13	I		G	C	B	C	B
B	A092	*Hieraaetus pennatus (Aquila pennata)*			r				P	DD	C		C	A
B	A439	*Hippolais olivetorum*			r				P	DD	C		C	B

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
B	**A251**	*Hirundo rustica*			c				p	DD	C	B	C	B
B	**A251**	*Hirundo rustica*			r				p	DD	C	B	C	B
B	**A338**	*Lanius collurio*			r	8	8	i/sq.km		M	C	B	C	B
B	**A339**	*Lanius minor*			r				P	DD	C		C	B
B	**A246**	*Lullula arborea*			p				C	DD	C	A	C	B
B	**A230**	*Merops apiaster*			r	3		p		M	C	B	C	B
B	**A260**	*Motacilla flava*			r				p	DD	C	A	C	B
B	**A077**	*Neophron percnopterus*			r	1	1	p		G	B	B	C	B
B	**A337**	*Oriolus oriolus*			r				p	DD	C	B	C	B
B	**A072**	*Pernis apivorus*			r				P	DD	C		C	B
B	**A210**	*Streptopelia turtur*			r	11	11	i/sq.km		M	C	B	C	B
B	**A307**	*Sylvia nisoria*			r				R	DD	B		B	B

Other important species in the area are based on the same source.

Species					Population in the site				Motivation					
G	CODE	Scientific Name	S	NP	Size		Unit	Cat.	Species Annex		Other categories			
					Min	Max		C|R|V|P	IV	V	A	B	C	D
B	**A687**	*Columba palumbus palumbus*						p			X			
B	**A687**	*Columba palumbus palumbus*						p						X

As shown in Table 12 above, the detailed population data for the GR1130011 site is very limited and for most species the information available is an estimate of their presence in the area (present, common, rare, very rare). Population data are only available for Accipiter brevipes, Aquila chrysaetos, Aquila pomarina (Clanga pomarina), Bubo bubo, Buteo buteo, Gyps fulvus, Lanius collurio, Merops apiaster, Neophron percnopterus and Streptopelia turtur. The above ten species include four (Neophron percnopterus, Aquila chrysaetos, Gyps fulvus, Lanius collurio) out of the ten species of the Natura site, and of the total number of species Accipiter brevipes, Aquila chrysaetos, Aquila pomarina (Clanga pomarina), Bubo bubo, Gyps fulvus, Lanius collurio and Neophron percnopterus are species of the avifauna listed in Annex I to Directive 2009/147/EK, while

Streptopelia turtur is a species listed in Annex II to that Directive and Buteo buteo and Merops apiaster are not included in the above-mentioned Annexes.

During the reference period for the site, the conservation status of most species was assessed as good (B) to excellent (A), except for Sylvia nisoria, Pernis apivorus, Lanius minor, Hippolais olivetorum, Hieraaetus pennatus, Ficedula parva, Ficedula semitorquata, Falco naumanni, Coracias garrulus and Ciconia ciconia, for which no conservation status was assessed. For the feature species Aegypius monachus, Circaetus gallicus, Ficedula semitorquata and Neophron percnopterus the site supported 2-15% of the Greek population (population criterion B), while for the feature species Aquila chrysaetos, Dendrocopos medius, Dendrocopos syriacus, Emberiza hortulana, Gyps fulvus and Lanius collurio the site supported 0-2% of the Greek population (population criterion C). For the majority of the remaining species, except for the species of special concern, the area supported 0-2 % of the Greek population (population criterion C), with the exception of Ciconia nigra, Circus aeruginosus, Gypaetus barbatus and Sylvia nisoria, for which population criterion B applies (the area supported 2-15 % of the Greek population) and Aquila heliaca for which population criterion A applies (the area supported more than 15 % of the Greek population).

Although, as already mentioned, the site of the project is located outside the Natura site GR1110002, the most important species of the avifauna of the SPA, as described in the 2019 edition of the Standardized Data Form (SDF), are presented below:

Table 13. *Standard data forms of the GR 1110002 site (End 2018_15/03/2019). (https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=GR1110002)*

Species					**Population in the site**						**Site assessment**			
G	**Code**	**Scientific Name**	**S**	**NP**	**T**	**Size**		**Unit**	**Cat.**	**D.qual.**	**A|B|C|D**	**A|B|C**		
						Min	**Max**				**Pop.**	**Con.**	**Iso.**	**Glo.**
B	A402	*Accipiter brevipes*			r	3	4	p		G	C	B	C	B
B	A168	*Actitis hypoleucos*			c	3		i		M	C	B	C	B
B	A079	*Aegypius monachus*			r	21	35	p		G	A	B	A	A
B	A247	*Alauda arvensis*			r				P	DD	C	B	C	B
B	A229	*Alcedo atthis*			p				P	M	C	B	C	B
B	A705	*Anas platyrhynchos platyrhynchos*			r	1		p		M	C	B	C	B
B	A255	*Anthus campestris*			r				P	M	C	B	C	B
B	A228	*Apus (Tachymarptis) melba*			r				P	DD	C	B	C	B
B	A226	*Apus apus*			r				P	DD	C	B	C	B
B	A091	*Aquila chrysaetos*			p	4	4	p		G	B	B	B	B
B	A090	*Aquila clanga*			w	4	7	i		G	C	B		C

Species					Population in the site						Site assessment			
G	**Code**	**Scientific Name**	**S**	**NP**	**T**	**Size**		**Unit**	**Cat.**	**D.qual.**	**A|B|C|D**	**A|B|C**		
						Min	**Max**				**Pop.**	**Con.**	**Iso.**	**Glo.**
B	**A404**	*Aquila heliaca*			w	4	4	i		G	A	C	B	B
B	**A089**	*Aquila pomarina*			r	16	19	p		G	A	B	C	B
B	**A699**	*Ardea cinerea cinerea*			c				P	M	D	B	C	B
B	**A215**	*Bubo bubo*			p	4	4	p		G	C	B	C	B
B	**A087**	*Buteo buteo*				117	128	p						
B	**A403**	*Buteo rufinus*			r	1	2	p		G	C	B	B	B
B	**A243**	*Calandrella brachydactyla*			c				P	DD	C	B	C	B
B	**A224**	*Caprimulgus europaeus*			r				P	M	C	B	C	B
B	**A667**	*Ciconia ciconia ciconia*			r	25	25	p		M	C	B	C	B
B	**A030**	*Ciconia nigra*			r	31	35	p		G	A	A	B	A
B	**A080**	*Circaetus gallicus*			r	37	40	p		G	B	B	C	B
B	**A081**	*Circus aeruginosus*			c				P	DD	B	B		B
B	**A081**	*Circus aeruginosus*			p	2	3	p		G	B	B	C	B
B	**A082**	*Circus cyaneus*			w	30		i		M	B	B	C	B
B	**A083**	*Circus macrourus*			c				P	DD	C	B		B
B	**A084**	*Circus pygargus*			c				P	DD	C	B		B
B	**A231**	*Coracias garrulus*			r				P	M	C	B	C	B
B	**A113**	*Coturnix coturnix*			r				P	M	C	B	C	B
B	**A738**	*Delichon urbicum (urbica)*			r				P	M	C	A	C	B
B	**A239**	*Dendrocopos leucotos*			p				P	DD	C	B	B	B
B	**A238**	*Dendrocopos medius*			p				P	M	C	B	C	B
B	**A429**	*Dendrocopos syriacus*			p	1	11	i/sq.km		M	C	B	C	B
B	**A236**	*Dryocopus martius*			p				P	DD	C	B	B	B
B	**A698**	*Egretta alba (Casmerodius albus albus)*			c				P	M	C	B	C	B
B	**A697**	*Egretta garzetta garzetta*			c				P	M	C	B	C	B
B	**A447**	*Emberiza caesia*			r				P	DD	C	B	B	B
B	**A379**	*Emberiza hortulana*			r	1	17	i/sq.km		M	C	B	C	B
B	**A101**	*Falco biarmicus*			p				P	DD	C	B	B	B
B	**A098**	*Falco columbarius*			c				P	DD	C	B	C	B
B	**A100**	*Falco eleonorae*			c				P	DD	C	B		B
B	**A095**	*Falco naumanni*												
B	**A709**	*Falco peregrinus brookei*			p	3	4	p		G	C	B	C	B
B	**A099**	*Falco subbuteo*				8	11	p						
B	**A097**	*Falco vespertinus*			c				P	DD	C	B		B
B	**A321**	*Ficedula albicollis*			c				P	DD	C	B	C	B
B	**A320**	*Ficedula parva*			c				P	DD	B	B	B	B
B	**A442**	*Ficedula semitorquata*			r				P	DD	C	B	B	B
B	**A723**	*Fulica atra atra*			r					M	C	B	C	B
B	**A153**	*Gallinago gallinago*			c				P	DD	D			
B	**A076**	*Gypaetus barbatus*												

Species					Population in the site						Site assessment			
G	**Code**	**Scientific Name**	**S**	**NP**	**T**	**Size**		**Unit**	**Cat.**	**D.qual.**	**A|B|C|D**	**A|B|C**		
						Min	**Max**				**Pop.**	**Con.**	**Iso.**	**Glo.**
B	A078	*Gyps fulvus*			c	115	115	i		G	A	B	B	B
B	A078	*Gyps fulvus*			p	0	3	p		G	C	B	B	B
B	A075	*Haliaeetus albicilla*			p	1	1	p		G	B	B	B	B
B	A075	*Haliaeetus albicilla*			w	4	16	i		G	B	B	B	B
B	A707	*Hieraaetus fasciatus (Aquila fasciata)*												
B	A092	*Hieraaetus pennatus (Aquila pennata)*			r	20	23	p		G	A	B	C	B
B	A439	*Hippolais olivetorum*			r				P	DD	C	B	C	B
B	A251	*Hirundo rustica*			r				P	M	C	B	C	B
B	A233	*Jynx torquilla*			r				P	DD	C	B	C	B
B	A338	*Lanius collurio*			r	2	28	i/sq.km		M	C	B	C	B
B	A339	*Lanius minor*			r				P	M	C	B	C	B
B	A433	*Lanius nubicus*			r	1	8	i/sq.km		M	C	A	B	B
B	A179	*Larus (Chroicocephalus) ridibundus*			c				P	DD	D			
B	A246	*Lullula arborea*			p	3	22	i/sq.km		M	C	B	C	B
B	A242	*Melanocorypha calandra*			r				C	M	C	B	C	B
B	A230	*Merops apiaster*			r				C	M	C	B	C	B
B	A073	*Milvus migrans*			r	0	1	p		G	C	B	B	B
B	A073	*Milvus migrans*			w	28	53	i		M		B	B	B
B	A074	*Milvus milvus*			c				P	DD	C	B		B
B	A260	*Motacilla flava*			r				P	M	C	B	C	B
B	A077	*Neophron percnopterus*			c				P	DD	A	B	B	A
B	A077	*Neophron percnopterus*			r	5	5	p		G	A	B	B	A
B	A610	*Nycticorax nycticorax nycticorax*			c				P	M	C	B	C	B
B	A337	*Oriolus oriolus*			r	2	9	i/sq.km		M	C	B	C	B
B	A094	*Pandion haliaetus*			c				P	DD	C	B		B
B	A771	*Passer hispaniolensis*			r				C	M	C	B	C	B
B	A072	*Pernis apivorus*			r	15	16	p		G	C	B	C	B
B	A391	*Phalacrocorax carbo sinensis*			c	3		i		M	C	B	C	B
B	A393	*Phalacrocorax pygmaeus*			c	10		i		M	C	B	C	B
B	A234	*Picus canus*			p				P	DD	C	B	B	B
B	A249	*Riparia riparia*			r				P	M	C	B	C	B
B	A210	*Streptopelia turtur*			r	5	30	i/sq.km		M	C	B	C	B
B	A307	*Sylvia nisoria*			r				P	DD	B	B	B	B
B	A166	*Tringa glareola*			c				R	DD	D			
B	A165	*Tringa ochropus*			c				P	DD	D			
B	A282	*Turdus torquatus*			c				P	DD	C	B	B	B
B	A142	*Vanellus vanellus*			w				P	DD	C	B	C	B

Other important species in the area based on the same source.

Species					Population in the site				Motivation					
G	CODE	Scientific Name	S	NP	Size		Unit	Cat.	Species Annex		Other categories			
					Min	Max		C|R|V|P	IV	V	A	B	C	D
B	A085	*Accipiter gentilis gentilis*			23	24	p				X			
B	A085	*Accipiter gentilis gentilis*			23	24	p						X	
B	A085	*Accipiter gentilis gentilis*			23	24	p							X
B	A086	*Accipiter nisus*			25	31	p				X			
B	A086	*Accipiter nisus*			25	31	p						X	
B	A086	*Accipiter nisus*			25	31	p							X
B	A509	*Aquila nipalensis*						P			X			
B	A509	*Aquila nipalensis*						P					X	
B	A509	*Aquila nipalensis*						P						X
B	A088	*Buteo lagopus*						P			X			
B	A088	*Buteo lagopus*						P					X	
B	A088	*Buteo lagopus*						P						X
B	A726	*Charadrius dubius curonicus*			5		p				X			
B	A726	*Charadrius dubius curonicus*			5		p						X	
B	A726	*Charadrius dubius curonicus*			5		p							X
B	A211	*Clamator glandarius*						P			X			
B	A211	*Clamator glandarius*						P					X	
B	A207	*Columba oenas*						P			X			
B	A207	*Columba oenas*						P					X	
B	A207	*Columba oenas*						P						X
B	A687	*Columba palumbus palumbus*						C			X			
B	A687	*Columba palumbus palumbus*						C						X
B	A096	*Falco tinnunculus*			8	14	p				X			
B	A096	*Falco tinnunculus*			8	14	p						X	
B	A096	*Falco tinnunculus*			8	14	p							X
B	A435	*Oenanthe isabellina*						P			X			
B	A435	*Oenanthe isabellina*						P					X	
B	A690	*Tachybaptus ruficollis ruficollis*						P			X			

Species					Population in the site				Motivation					
G	CODE	Scientific Name	S	NP	Size		Unit	Cat.	Species Annex		Other categories			
					Min	Max		C|R|V|P	IV	V	A	B	C	D
B	**A690**	*Tachybaptus ruficollis ruficollis*						P					X	
B	A690	*Tachybaptus ruficollis ruficollis*						P						X

As shown in Table 13 above, detailed population data for the specific area GR1110002 are limited and for many species the available information is an estimate of their presence in the area (present, common, rare, very rare). Population data are available for only 33 of the 83 species: Accipiter brevipes, Actitis hypoleucos, Aegypius monachus, Anas platyrhynchos, Aquila chrysaetos, Aquila clanga (Clanga clanga, Aquila heliaca, Aquila pomarina (Clanga pomarina), Bubo bubo, Buteo buteo, Buteo rufinus, Ciconia ciconia, Ciconia nigra, Circaetus gallicus, Circus aeruginosus, Circus cyaneus, Dendrocopos syriacus, Emberiza hortulana, Falco peregrinus brookei, Falco subbuteo, Gyps fulvus, Haliaeetus albicilla, Hieraaetus pennatus (Aquila pennata), Lanius collurio, Lanius nubicus, Lullula arborea, Milvus migrans, Neophron percnopterus, Oriolus oriolus, Phalacrocorax carbo, Phalacrocorax pygmaeus (Microcarbo pygmaeus), Streptopelia turtur and Pernis apivorus. The above 33 species include nine of the 11 designated species of this Natura site, and of the total, 26 are Annex I species of the avifauna Annex I of Directive 2009/147/EK, one (Streptopelia turtur) is an avifauna species of Annex II of the above Directive, while six of them (Buteo buteo, Actitis hypoleucos, Falco Subbuteo, Lanius nubicus, Phalacrocorax carbo and Oriolus oriolus) are not included in the above Annexes.

During the reporting period for the area, the conservation status was assessed for the majority of species as good (B) to excellent (A), except for Aquila heliaca, for which the conservation status was assessed as moderate or degraded (Criterion C), and the species Buteo buteo, Falco naumanni, Falco subbuteo, Gallinago gallinago, Gypaetus barbatus, Hieraaetus fasciatus (Aquila fasciata), Larus (chroicocephalus) ridibundus, Tringa glareola and Tringa ochropus for which no conservation assessment was made. For the characterisation species Aegypius monachus, Aquila pomarina (Clanga pomarina), Gyps fulvus, Hieraaetus pennatus and Neophron percnopterus, the area supported more than 15 % of the Greek population with a population criterion of A, for the species Aquila chrysaetos and Circaetus gallicus the area supported 2-15 % of the Greek population, having population criterion

B, while for the species Hippolais olivetorum, Aquila clanga (Clanga clanga), Bubo bubo, Nycticorax nycticorax the area supported 0-2 % of the Greek population, having population criterion C. For the majority of the other species listed in the corresponding SDF (except for the characterisation species mentioned above) the area supported 0-2% of the Greek population (population criterion C), except for the species Ciconia nigra and Aquila heliaca for which the area supported more than 15%, the species Circus aeruginosus, Circus cyaneus, Ficedula parva, Haliaeetus albicilla and Sylvia nisoria for which the area supported 2-15 % of the Greek population (population criterion B) and the species Gallinago gallinago, Tringa glareola, Tringa ochropus, Ardea cinerea and Larus (chroicocephalus) ridibundus for which the area supported a non-significant number (criterion D).

Although, as already mentioned, the site of the project under study is located outside the neighboring Bulgarian Natura site BG0002019, the most important species of the avifauna of the SPA, as described in the 2021 version of the Standardized Data Form (SDF), are presented below:

***Table 14**. Standard data forms of the BG0002019 area (End 2020_22/06/2021). (https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=BG0002019)*

Species					**Population in the site**						**Site assessment**			
G	**Code**	**Scientific Name**	**S**	**NP**	**T**	**Size**		**Unit**	**Cat.**	**D.qual.**	**A|B|C|D**	**A|B|C**		
						Min	**Max**				**Pop.**	**Con.**	**Iso.**	**Glo.**
B	**A402**	*Accipiter brevipes*			r	2	2	p		G	C	B	C	C
B	**A086**	*Accipiter nisus*			p	3	18	p		G	C	A	C	C
B	**A168**	*Actitis hypoleucos*			r	3	4	p		G	C	A	C	C
B	**A079**	*Aegypius monachus*			p		46	i		G	C	A	B	B
B	**A229**	*Alcedo atthis*			c	9	9	i		G	C	A	C	C
B	**A229**	*Alcedo atthis*			p	10	21	p		G	C	A	C	C
B	**A053**	*Anas platyrhynchos*			p	2	2	p		G	C	A	C	C
B	**A255**	*Anthus campestris*			p	2	2	p		G	C	B	C	C
B	**A091**	*Aquila chrysaetos*			p	2	3	p		G	C	A	C	C
B	**A404**	*Aquila heliaca*			p	1	2	p		G	A	A	C	A
B	**A089**	*Aquila pomarina*			r	4	12	p		G	C	A	C	B
B	**A028**	*Ardea cinerea*			w	3	15	i		G	C	B	C	C
B	**A028**	*Ardea cinerea*			c				P	DD	C	B	C	C
B	**A215**	*Bubo bubo*			p	2	2	p		G	C	A	C	C
B	**A133**	*Burhinus oedicnemus*			r	2	2	p		G	C	B	C	B
B	**A087**	*Buteo buteo*			p	19	30	p		G	C	A	C	C
B	**A403**	*Buteo rufinus*			p	4	5	p		G	C	A	C	C
B	**A224**	*Caprimulgus europaeus*			r	136	326	p		G	C	A	C	A
B	**A136**	*Charadrius dubius*			r	12	24	p		G	C	A	C	C

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
B	A031	*Ciconia ciconia*			r	5	5	p		G	C	A	C	C
B	A030	*Ciconia nigra*			r	6	18	p		G	B	A	C	A
B	A080	*Circaetus gallicus*			r	9	11	p		G	C	A	C	B
B	A084	*Circus pygargus*			r	1	1	p		G	C	A	C	C
B	A231	*Coracias garrulus*			r	6	9	p		G	C	A	C	C
B	A239	*Dendrocopos leucotos*			p	15	19	p		G	C	B	C	C
B	A238	*Dendrocopos medius*			p	100	150	p		G	C	A	C	B
B	A429	*Dendrocopos syriacus*			p	200	350	p		G	C	A	C	C
B	A236	*Dryocopus martius*			p	9	21	p		G	C	A	C	B
B	A027	*Egretta alba*			c				P	DD	C	B	C	C
B	A026	*Egretta garzetta*			c				P	DD	C	B	C	C
B	A379	*Emberiza hortulana*			r	67	194	p		G	C		C	C
B	A095	*Falco naumanni*			r		1	p		G	A	A	B	B
B	A103	*Falco peregrinus*			r	2	2	p		G	C	A	C	C
B	A099	*Falco subbuteo*			r	7	7	p		G	C	A	C	C
B	A096	*Falco tinnunculus*			p	18	18	p		G	C	A	C	C
B	A097	*Falco vespertinus*			c				P	DD	C	B	C	C
B	A442	*Ficedula semitorquata*			r	2	25	p		G	C	B	C	C
B	A125	*Fulica atra*			c				P	DD	C	B	C	C
B	A123	*Gallinula chloropus*			p	1	5	p		G	C	A	C	C
B	A127	*Grus grus*			c	20	20	i		G	C	B	C	C
B	A078	*Gyps fulvus*			p		35	i		G	C	A	C	C
B	A075	*Haliaeetus albicilla*			c				V	DD	C	B	C	C
B	A093	*Hieraaetus fasciatus*			c	1	1	i		G	A	B	B	A
B	A093	*Hieraaetus fasciatus*			r		3	i		G	A	B	B	A
B	A092	*Hieraaetus pennatus*			r	2	8	p		G	B	A	C	A
B	A439	*Hippolais olivetorum*			r	30	40	p		G	C	A	C	A
B	A022	*Ixobrychus minutus*			c				P	DD	C	B	C	C
B	A022	*Ixobrychus minutus*			r	1	1	p		G	C	B	C	C
B	A338	*Lanius collurio*			r	4500	5500	p		G	C	A	C	B
B	A339	*Lanius minor*			r	29	29	p		G	C	A	C	C
B	A433	*Lanius nubicus*			r	8	8	p		G	B	A	C	A
B	A459	*Larus cachinnans*			c				P	DD	C	B	C	C
B	A179	*Larus ridibundus*			c				P	DD	C	B	C	C
B	A246	*Lullula arborea*			p	424	469	p		G	C	A	C	A
B	A230	*Merops apiaster*			c				P	DD	C	B	C	C
B	A230	*Merops apiaster*			r	290	290	p		G	C	A	C	C
B	A073	*Milvus migrans*			r	2	2	p		G	C	A	C	B
B	A077	*Neophron percnopterus*			r	1	2	p		G	B	A	C	A

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
B	**A023**	*Nycticorax nycticorax*			c				P	DD	C	B	C	C
B	**A072**	*Pernis apivorus*			r	8	25	p		G	C	A	C	A
B	**A017**	*Phalacrocorax carbo*			w				P	DD	C	B	C	C
B	**A234**	*Picus canus*			p	5	10	p		G	C	A	C	C
B	**A307**	*Sylvia nisoria*			r	35	45	p		G	C	B	C	C
B	**A004**	*Tachybaptus ruficollis*			c				P	DD	C	B	C	C
B	**A165**	*Tringa ochropus*			c				P	DD	C	B	C	C
B	**A142**	*Vanellus vanellus*			c				P	DD	C	B	C	C

As shown in Table 14 above, detailed population data for the BG0002019 site exist for many species, while for those species for which no population data exist, the information available is an estimate of their presence in the site (present, common, rare, very rare). Population data are not available only for Egretta alba, Egretta garzetta, Falco vespertinus, Fulica atra, Haliaeetus albicilla, Larus cahinnans, Larus ridibundus, Nycticorax nycticorax, Phalacrocorax carbo, Tachybaptus ruficollis, Tringa ochropus, Vanellus vanellus out of the 61 species listed in the SDFs for the area concerned. Of the remaining 49 species showing population data, 39 (Accipiter brevipes, Aegypius monachus, Alcedo atthis, Anthus campestris, Aquila chrysaetos, Aquila heliaca, Aquila pomarina (Clanga pomarina), Bubo bubo, Burhinus oedicnemus, Buteo rufinus, Caprimulgus europaeus, Ciconia ciconia, Ciconia nigra, Circaetus gallicus, Circus pygargus, Coracias garrulus, Dendrocopos leucotos, Dendrocopos medius (Leiopicus medius), Dendrocopos syriacus, Dryocopus martius, Emberiza hortulana, Falco naumanni, Falco peregrinus, Ficedula semitorquata, Grus grus, Gyps fulvus, Hieraaetus fasciatus (Aquila fasciata), Hieraaetus pennatus, Hippolais olivetorum, Ixobrychus minutus, Lanius collurio, Lanius minor, Lanius nubicus, Lullula arborea, Milvus migrans, Neophron percnopterus, Pernis apivorus, Picus canus, Sylvia nisoria) are species of the avifauna listed in Annex I to Directive 2009/147/EK.

During the reference period for the area, the conservation status of many species was assessed from good (B) to excellent (A), except for Emberiza hortulana, for which no conservation assessment was made. For the majority of the 39 species listed in Annex I of Directive 2009/147/EK, the site supported 0-2% of the Bulgarian population (population criterion C), except for Aquila heliaca, Falco naumanni and Hieraaetus fasciatus for which the site supported more than 15 % of the Bulgarian population, population criterion A, while for Ciconia nigra, Hieraaetus pennatus, Lanius nubicus and

Neophron percnopterus the site supported 2-15 % of the Bulgarian population, population criterion B.

For all other species listed in the respective SDFs (except for the species listed in Annex I of Directive 2009/147/EK mentioned above), the area supported 0-2% of the Bulgarian population (population criterion C).

List the main characteristics of all habitat types in Annex I and/or species in Annex II of Directive 92/43/EOK (if SAC, SCI or pSCI) and/or species of avifauna listed in Annex I to Directive 2009/147/EK and regularly migratory species (if SPA) and the main characteristics of endemic, threatened and protected species.

The production license blocks of the wind power plant under study are located outside the protected areas of the Natura 2000 network SAC, SCI and therefore there is no recording and mapping of the habitat types of Annex I of Directive 92/43/EOK, nor is there a relevant reason.

According to the database and land cover mapping (Corine Land Cover 2018), which is reflected in the documentation maps, the area of the production permit polygon for the Pyramis Vrachou wind farm is located within an area of natural grassland, deciduous and broadleaf forest (see Documentation Maps section, Map 7). The above habitat types also cover most of the project field survey area, with the habitat mosaic being complemented by areas of agricultural land, significant areas of natural vegetation, areas of coniferous forest, mixed forest and transitional woodland and scrub. In general, the above habitat types predominate in the area.

From all the above data presented in the most detailed manner in the previous sections of this Special Ecological Assessment, the species listed as characterization and delimitation species of SPA GR1110010 and the characterization species of SPA GR003, within which the project is located, were selected for further analysis. In addition, the identification species of the nearest Greek SPA GR1130011 and the nearest SPA GR008 were selected for further analysis. In addition, all large and non-predatory species (as well as the white stork and the Aegolius) of Annex I to Directive 2009/147/EK included in the TAPs of the two study SPAs and the two remaining study SPAs, the neighboring Bulgarian study SPA BG0002019 and the more distant SPA GR1110002, were selected.

Therefore, the total of 46 species analyzed below, and henceforth referred to as species of "interest", consists of (listed by their new IUCN Latin names): Dendrocopos syriacus, Emberiza hortulana, Ficedula semitorquata, Accipiter brevipes, Buteo rufinus, Clanga pomarina, Ciconia nigra, Circaetus gallicus, Hieraaetus pennatus, Neophron percnopterus, Pernis apivorus, Aquila chrysaetos, Haliaeetus albicilla, Aegolius funereus, Bubo bubo, Falco naumanni, Falco peregrinus, Falco columbarius, Gyps fulvus, Aegypius monachus, Clanga clanga, Leiopicus medius, Lanius collurio, Emberiza caesia, Hippolais olivetorum, Strix aluco, Curruca crassirostris, Curruca melanocephala, Curruca cantillans, Phylloscopus orientalis, Picus viridis, Sitta neumayer, Oenanthe hispanica, Emberiza melanocephala, Aquila heliaca, Milvus migrans, Aquila fasciata, Pandion haliaetus, Circus aeruginosus, Circus cyaneus, Circus pygargus, Circus macrourus, Falco eleonorae, Falco vespertinus, Milvus milvus, Ciconia ciconia.

From all the above data, presented in previous sections of this Special Ecological Assessment, in the most detailed way, 46 species of interest were selected for further analysis, the main characteristics of which are analyzed below by synthesizing information from reliable literature sources (Legakis, A. and Marangou, P. (eds.) 2009. The Red Book of Endangered Animals of Greece. Hellenic Zoological Society, Athens, 528 p.; Bakaloudis D. 2008. Biology of Wild Fauna. Yachoudis Publications, Thessaloniki, p. 413, IUCN Red List of Threatened Species, www.iucnredlist.org available on 10/03/2023, etc., Deliverable 3 List of threats to the species of designation of the Identification of compatible activities in relation to the species of designation of the Special Protection Areas for avifauna with the Ministry of the Environment, Urban Planning and Public Works as the contracting authority. - Department of Environmental Planning Department of Natural Environment Management (Dimalexis 2009), Deliverable 8 Guide to ecological requirements, threats, and appropriate measures for the species characterization of the Identification of compatible activities in relation to the species characterization of the Special Protection Areas of avifauna with the contracting authority the Ministry of the Environment, Urban Planning and Public Works. The species of interest which are analyzed below are referred to by their new Latin names (according to the IUCN), while as regards their common name, the one given in the Red Book of Threatened Animals of Greece was chosen (Legakis and Marangou 2009).

Cinereous vulture (Aegypius monachus)

According to the most recent data and literature review resulting from Xirouhakis (2019) and the deliverable of the project LIFE16 IPE/GR/000002 [Action Plan for three scavenging species of avifauna (vultures): Bearded Vulture - Gypaetus barbatus, Eurasian griffon vulture (Gyps fulvus), Cinereous Vulture - Aegypius monachus] "Aegypius monachus in Greece has never been a widespread species, probably due to its dependence on forest ecosystems (with stands of specific forest species with large, mature trees suitable for breeding), which have low availability nationally. In the 1970s the species maintained three isolated subpopulations, in the forest of Dadia in Evros with 15 pairs, in Olympus with 2 pairs and in Parnassos and Giona with the presence of mature individuals (Map 3.3-4). At the same time there were observations of wandering individuals on the northern border of the country with Bulgaria and North Macedonia (Hallmann 1985; Handrinos 1985; Grubač 1997). Until the 1990s the population of the species had a strong downward trend (Map 3.3-3). The colony of Dadia by 1979 had declined to 4-5 pairs and to no more than 26 individuals, while the small breeding core of Olympus disappeared by 1988 (Xirouchakis and Tsiakiris 2009). Thus, the last and only breeding population of the species in southeastern Europe remained in Evros. In the period 1987-2005, thanks to targeted management actions, led by the provision of food, the species began to recover. After the establishment and operation of the first raptor feeding station in Greece in 1987, the population reached 20 pairs and 68 individuals in 1994 (Poirazidis et al. 1997, Vlachos et al. 1999, Skartsi et al. 2008). This increasing trend was interrupted by incidents of mass poisoning of mature birds in 1995 and in the period 1995-2000 it showed a characteristic population stagnation, with 19-22 pairs. Today the population of the species is estimated at 28-35 pairs based on the breeding behavior of adults or 120-130 individuals based on counts at the feeding site of Dadia (Skartsi and Poirasidis 2002; Skartsi et al. 2010; BirdLife 2017; Bakaloudis pros. comm.)."

The European population of the species is estimated at 2,900-3,400 pairs (5,800-6,700 mature individuals), while in the EU28, according to the IUCN red list, the population is estimated at 2,600-2,700 pairs (5,200-5,400 mature individuals). The Greek population of the species is estimated to number 30-35 pairs, corresponding to 1% of the European population (BirdLife International 2021).

The species is protected by Directive 2009/147/EK (Annex I) and the Bern (Annex II) and Bonn (Annex II) Conventions.According to the Greek Red Data Book in Greece the species is classified as endangered (EN), while according to the IUCN at European level as a species of reduced concern (LC) (BirdLife International 2021). It is also classified as a SPEC 1 species of European interest in terms of protection by BirdLife International (BirdLife International 2017) and is also protected by the CITES International Convention (Appendix II).

In Europe, as in Greece, its population has been increasing in recent years. At the European level, due to its wide range and the increasing population trend in recent years, the species is classified as "Least Concern", while at the global level its conservation status has been updated from "Threatened" (1988) to "Near Threatened" (2004 and onwards) (BirdLife International 2018).

It is a species that nests solitarily and with obvious fidelity to the nesting sites. Compared to the vulture, it makes short movements, especially in the non-breeding age. It frequents wooded semi-mountainous and mountainous areas and nests in mature pine trees surrounded by small openings or low vegetation on very steep slopes. Its feeding areas are characterized by pine forests, oak forests, beech forests with forest clearings, meadows, and small fields. It feeds on small and medium-sized mammal carcasses, choosing hard body parts such as skin, flesh, and even small bones that it can swallow whole. It is often observed in the Dadias National Park to steal from the ground the turtles that are snatched and broken by the golden eagle (Skartsis and Poirazidis 2002). The breeding season lasts from mid-January to mid-March, with most of the nesting occurring in late March. It lays an egg that incubates for 50-55 days, with the chick hatching after about 100 days. The reproductive success of the species in the period 1994-2005 averaged 72% (feathered chicks/spawning pairs).

Secondary poisoning is the most serious threat to the species (Goutner et al. 2011), and the sitting of wind farms in foraging areas is an additional source of mortality. Land-use change and animal encroachment degrade foraging habitat.

Protected species, the entire breeding population in Greece is found in the National Park of Dadia, where most nests are located within the Strict Protection Zone. The long-term supplementary feeding carried out in the Dadia Nature Reserve has made a very positive contribution to the survival of the population, especially the juveniles. A significant part of the feeding sites outside the Dadia Nature Reserve are also found in areas of the SPA/Natura 2000 network.

Strict control of illegal use of poisoned bait, promotion of free grazing and improvement of ungulate populations inside and outside the boundaries of Dadia National Park is needed. Proper sitting of wind farms in the feeding areas outside Dadia National Park can reduce the incidence of impacts from wind turbines and associated works. Supplementary feeding should continue unless there is a change in the current parameters that determine natural food levels and the intensity of threats. Continuous monitoring of population parameters, movements and threats to the species is essential to evaluate the implementation of any proposed conservation measures.

According to the threats recorded in the list of threats to the species (Dimalexis 2009), the reported threats to the species are:

- Forest plantations for wood production
- Intense and stall farming
- Residential development, urban or extra-urban, legal, or arbitrary
- Renewable energy: Wind farms
- Construction of all types of roads and railways

- Transmission lines (electricity, telephone), oil and gas pipelines
- Illegal use of poisoned baits to control "pest" mammals
- Persecution by specific users as harmful
- Improper forest management
- Nuisance activities (hunting, logging, fishing, plant, and firewood collection
- Changes in the frequency and intensity of forest fires (increase or decrease)
- Construction of dams and flood protection interventions, irrigation networks
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming
- Changes in habitat extent and distribution due to climate change

The threats listed in the IUCN Red List are direct human-induced mortality (accidental or deliberate) and reduced food availability. The use of poisoned bait to kill 'nuisance' predators, poaching and nest destruction are additional threats to the species. In Europe, reduced food availability has previously been caused by European Union legislation on the disposal of carcasses. However, recently adopted regulations will allow the operation of feeding stations. In Eastern Europe, particularly in the former Soviet Union, changes in agricultural practices and human migration from rural to urban areas have significantly reduced the number of domestic animals. In Georgia and Armenia, the decline may be linked to the loss of subsidies for sheep farming in the post-Soviet era. There has also been a sharp decline in many wild ungulate populations, which are an important food source for the species. Habitat loss is also considered to be significant (Anon. 2004). Outside Europe, many birth losses occur during the incubation period, and it is suggested that this may be partly due to low and fluctuating temperatures (Batbayar et al. 2006), so changes in air temperature because of climate change may be a potential future threat to the species.

The proposed conservation actions, according to the IUCN, are as follows:

- Research to determine population trends of the species in breeding areas outside Europe, as well as in wintering areas.
- Research into threats to the species, particularly the decline in its prey abundance.

- Carry out reintroductions to link the western and eastern range of the species, following the recommendations of the IUCN and the Black-tailed Godwit Conservation Foundation.
- Develop a captive breeding program and future reintroduction efforts.
- Restore wild rabbit (Oryctolagus cuniculus) populations in the Iberian Peninsula and Balearic Islands, as this may help increase food availability, particularly during the breeding season.
- Promote cooperation and information exchange between people and organizations working on the species, both nationally and internationally.
- Strengthen legislation regulating the trade in poisons used to poison meat baits.
- Prosecutions and further strengthening of judicial penalties for illegal poisoning.

Griffon Vulture - Gyps fulvus

According to the most recent data and literature review resulting from Xirouhakis (2019) and the deliverable of the LIFE16 IPE/GR/000002 project [Action Plan for three scavenging species of avifauna (vultures): Bearded Vulture (Gypaetus barbatus), Griffon Vulture (Gyps fulvus), Cinereous Vulture (Aegypius monachus)] "the total number of vulture individuals before the 1980s was estimated at 600-970 individuals with 300- 470 in mainland Greece and 300-400 in Crete (Tewes 1994). However, the first and most detailed report on the population of the species on a national scale was made in the 1980s and estimated the population at 450 pairs (Handrinos 1985). The species had already disappeared from all major Ionian and Aegean islands except Naxos, while it was extant in Thrace (30 pairs), Macedonia (30 pairs), Epirus (>70 pairs), Thessaly (80 pairs): Ossa (15), central Pindos (35) and Olympos (20-30), the island of Oxia in the Acheloos estuary in the Ionian Sea (8-10 pairs), Peloponnese (10 pairs), Central Greece (100 pairs) and Crete (500 individuals). The above data are the most valid historical reference for the status of the species and are assessed as the most reliable for comparisons, for calculating population trends and as favorable reference values and future conservation targets for the species on a national scale. In the period 1990-2000 the population reached 120-130 pairs (Hallmann 1996) and recovered in the 2000-2010 decade to 170-200 pairs, of which 25-30 pairs (90-110 individuals) were found in mainland Greece, while the remaining 150-160 pairs (370-450 individuals) were found on the islands (Bourdakis 2003; Xirouchakis and Mylonas 2005; Bourdakis et al. 2006). This increase was due to the population in Crete at 140-160 breeding pairs

(340-420 individuals), which were distributed in 24-28 colonies. In the current decade, the species has remained in Thrace (four colonies hosting a total of 10-12 pairs), Etoloakarnania (three colonies with 10-15 pairs), Cyclades (Naxos, Herakleia, one colony with 9-10 pairs). On the contrary, the species in Crete hosts 78 colonies of 250-340 pairs (900-1000 individuals), i.e., it has almost doubled (and is the largest island population in the world). The reproductive success of the species in Crete in the 2000s was 75% (range = 69-82%) and productivity ranged from 0.46 to 0.59 chicks/breeding pair/year, meaning that about 70-90 young were entering the population annually (Xirouchakis 2003). The total population is estimated at 280-380 pairs, while the decline in mainland Greece is estimated at 85%. The continental population of the species is an integral part of the Balkan population since in the last 30 years tagged individuals from Croatia, Serbia and Bulgaria have been frequently recorded in northern (Thrace) and western Greece (mainly in western Pindos up to Agrafa) and the Cyclades, and recently up to the Peloponnese (Stoychev et al. 2005; Jerrentrup and Efthimiou 2006; Xirouchakis and Tsiakiris 2009). These individuals frequently visit Greece to feed and breed. Also, individuals from Evros have been recorded in Bulgaria, North Macedonia, while juvenile tagged individuals from Italy, France, Serbia, Bulgaria, and Israel have been observed respectively in the feeding area of the protected area of Dadia mainly in the autumn months (60-100 individuals, Skartsi et al. 2010), i.e. the period of the natal dispersal of the species".

The European population is estimated at 32,400-34,400 pairs (69,600-89,400 mature individuals), while in the EU28 it is estimated at 33,700-41,900 pairs (67,400-83,800 mature individuals) according to the IUCN Red List. The Greek population is estimated at 380-800 pairs (BirdLife International 2021). Based on the above data, Greece hosts 1% of the European population.

The species is protected under Directive 2009/147/EC (Annex I) and the Bern (Annex II) and Bonn (Annex II) Conventions. According to the Greek Red Data Book, the species is classified in Greece as Vulnerable (VU/CR), while at European level it is listed by IUCN as Least Concern (LC) (BirdLife International 2021). It is also not classified by BirdLife International as a species of European interest in terms of conservation, although it is protected by the CITES Convention (Appendix II).

The vulture is a species, typical of open lands, found in semi-mountainous and mountainous areas, exploiting livestock activities (Handrinos and Akriotis 1997, Bourdakis et al. 2004, Xirouchakis and Andreou 2009). It feeds exclusively on large or medium-sized ungulate carcasses, from which it selects the soft body parts, with a particular preference for viscera (Tucker and Heath 1994, Xirouchakis 2005). The spread of its colonies always coincides with the presence of limestone substrates (Xirouchakis and Mylonas 2005b), where many pairs nest together in steep cliffs, gorges, and steep rocks almost above the sea (Vagliano 1981, Handrinos and Akriotis 1997, Xirouchakis and Mylonas 2004). In Crete, where the population has been studied more extensively, the altitude of the colonies ranges from 120-1,100 m, with a predominantly south-western orientation (Xirouchakis and Mylonas 2004). 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 (Xirouchakis 2003). The reproductive success of the species ranges from 69-82%, while its productivity is 0.52 chicks per breeding pair per year. On average, 70-90 young are fledged annually on the island (Xirouchakis and Tsiakiris 2008).

The vulture is a hoarding species, typical of open lands, found in semi-mountainous and mountainous areas, exploiting livestock activities (Handrinos and Akriotis 1997, Bourdakis et al. 2004, Xirouchakis and Andreou 2009). It feeds exclusively on large or medium-sized ungulate carcasses, from which it selects the soft body parts, with a particular preference for viscera (Tucker and Heath 1994, Xirouchakis 2005). The spread of its colonies always coincides with the presence of limestone substrates (Xirouchakis and Mylonas 2005b), where many pairs nest together in steep cliffs, gorges, and steep rocks almost above the sea (Vagliano 1981, Handrinos and Akriotis 1997, Xirouchakis and Mylonas 2004). In Crete, where the population has been studied more extensively, the altitude of the colonies ranges from 120-1,100 m, with a predominantly south-western orientation (Xirouchakis and Mylonas 2004). The breeding season lasts from mid-January to mid-March, with most of the nesting occurring in late February. It lays one egg, which incubates for 57 days, with the chick hatching in 120-140 days (Xirouchakis 2003). The reproductive success of the species ranges from 69-82%, while its productivity is 0.52 offspring per breeding pair per year. On average, 70-90 young are fledged annually on the island (Xirouchakis and Tsiakiris 2008).

Protected species, all its colonies are found in areas of the SPA/Natura 2000 network. Its population is systematically monitored only in Crete, while some colonies in Macedonia and Thrace are systematically supported by artificial food supply (feeders). In Crete there are two fenced feeding stations, which are occasionally maintained by farmers in the surrounding areas.

Strict control of the illegal use of poisoned baits and systematic operation of feeders is needed to maintain the remaining colonies. A study of the impact of the operation of existing wind farms is also needed, and specifications for the siting of planned wind farms need to be drawn up. In all cases, management actions for the species should include colony monitoring and public information and awareness programs to reduce poaching.

According to the threats recorded in the list of threats to the species (Dimalexis 2009), the reported threats to the species are: Intensive and stable livestock farming.

- Residential development, urban or unplanned, legal, or arbitrary
- Commercial-industrial development (ports, airports, industrial zones)
- Extractive activities: quarries-mining
- Renewable energy: Wind farms
- Construction of all types of roads and railways
- Transmission lines (electricity, telephone), oil and gas pipelines
- Illegal use of poisoned baits to control "pest" mammals
- Persecution by specific users as harmful
- Nuisance recreational activities
- Changes in the frequency and intensity of forest fires (increase or decrease)
- Construction of dams and flood protection interventions, irrigation networks
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming
- Pollution from agrochemicals discharged into water bodies, waterlogging of receptors.
- Changes in habitat extent and distribution due to climate change

Threats listed on the IUCN red list are poisoning from poison baits intended for "noxious" predators (Snow and Perrins 1998, Ferguson-Lees and Christie 2001). In some areas, the reduction in available food resulting from changes in livestock management practices has had a severe impact (Ferguson-Lees and Christie 2001). The species is very vulnerable to the effects of potential wind energy development (Strix 2012).

The recommended conservation actions, according to the IUCN, are as follows:

- Maintain and promote non-intensive livestock management systems (extensive livestock farming) to ensure food supply for the species.
- Establish and maintain feeding stations, particularly in areas where food is scarce.
- Avoiding large and extensive wooded areas and therefore maintaining large areas of open habitat required by the species for foraging (Tucker and Heath 1994).

- Prohibit abandonment of poisoned carcasses and encourage abandonment of dead animals.

Egyptian Vulture - Neophron percnopterus

Until the first post-war years the Egyptian vulture was a common and widespread species in all lowland and semi-mountainous areas of the country. In the last 30-40 years, however, the species has shown a clear and continuing population decline. The first estimate (in the 1980s) put the breeding population in Greece at 200-250 pairs, with the largest concentration in Meteora (Handrinos and Akriotis 1997). In 1994-2003 it was estimated that there were still 100-140 pairs, while in 2009 the total population did not exceed 30-50 pairs, half of which were found in Evros.

However, these pairs have dramatically decreased even more in recent years, and now (2018) they amount to five in all of Greece (Saravia et al. 2019).

According to Poirazidi (2017), the number of the species' territories in the National Park of Dadia - Lefkimi - Soufli in 2012 was 5.

The European population of the species is estimated at 3,000 - 4,500 pairs (6,100 - 9,000 mature individuals), while in the EU28 the population is estimated at 1,700 - 1,900 pairs (3,400 - 3,800 mature individuals). The Greek population is estimated to number approximately 5 - 12 pairs (BirdLife International 2021), which corresponds to <1% of the European population.

In general, there are difficulties in locating territories and monitoring the Egyptian vulture population due to the now low densities and the behavior of the species. During migration, especially in autumn, individual Egyptian vultures move southwards over the Peloponnese, Crete, etc. (Handrinos and Akriotis 1997).

The species is protected by Directive 2009/147/EK (Annex I) and the Bern (Annex II) and Bonn (Annexes I and II) Conventions. According to the Greek Red Data Book in Greece and the IUCN at European level, the species is classified as threatened (CR and VU respectively) (BirdLife International 2021). It is also classified as a SPEC 1 species of European interest in terms of protection by BirdLife International (BirdLife International 2017) and is also protected by the CITES International Convention (Appendix II).

Egyptian vultures nest solitarily at densities determined by local conditions of food availability and suitable nesting sites (rocks). In such ideal situations the species forms loose colonies, as it did previously in Meteora. Social vultures in feeding areas feed largely on carrion and any other residue of organic origin, even mammalian excrement, while their diet is supplemented with small vertebrates (mainly turtles). It arrives at the breeding grounds around the end of March and starts incubating its eggs (1-2, very rarely 3) around the end of April. The offspring hatch in June but remain in the nest until early September. There are no reliable data on the reproductive success of the species in Greece, but it is estimated to be very low. Around mid-September the bulk of the population departs for central Africa via the Bosphorus.

The most important threat to the species is secondary poisoning caused by the illegal use of poisoned baits mainly by livestock farmers. Changes in land use, especially the decline in extensive livestock farming, combined with recent strict veterinary hygiene regulations, also directly limit food availability, as the Egyptian vulture used to depend locally on scattered livestock farms and, more recently, largely on open dumpsites, especially where there was regular dumping of dead animals and slaughterhouse waste. Finally, poaching incidents and disturbance in breeding areas (e.g., climbing, rock lighting) have a very negative impact on the already critically small breeding population in our country. Any other negative factors for the species remain unknown, both during migration and in Africa, where it winters, and data from other countries demonstrate dangerously high accumulation of chemicals in offsprings.

As a protected species, almost the entire breeding population in Greece is found in SPA/Natura 2000 sites. The population in Evros is supported by the feeding station in the Dadia National Park.

The immediate priority is to strictly control the illegal use of poison baits and to systematically provide supplementary feeding (feeders) where the species used open dumps in the past, as well as near any isolated areas. Any Environmental Impact Assessment of projects located near or within the species' territories (e.g., road widening, siting of wind and hydroelectric projects, installation of high-voltage pylons) should necessarily ensure that the Egyptian Vulture's nesting and feeding area is fully protected. In addition, it is imperative to carry out a full survey to identify all areas, as well as to thoroughly investigate its specific biology (feeding, reproduction, limiting factors) and to investigate any still unknown threats (e.g. antibiotics, chemicals in the food chain, etc.). Finally, it is essential to raise public awareness, in particular among farmers, hunters and stockbreeders.

According to the threats recorded in the list of threats to the species (Dimalexis 2009), the reported threats to the species are:

- Intensive and stabled livestock farming
- Residential development (urban or unplanned, legal, or arbitrary)
- Mining activities: quarries – mines
- Renewable energy: Wind farms
- Construction of all types of roads and railways
- Transmission lines (electricity, telephone), oil and gas pipelines
- Illegal use of poisoned baits to control "pest" mammals
- Persecution by specific users as harmful
- Nuisance recreational activities
- Changes in the frequency and intensity of forest fires (increase or decrease)
- Construction of dams and flood protection interventions, irrigation networks
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming
- Changes in habitat extent and distribution due to climate change

The threats listed in the IUCN red list are lead poisoning (from firearms), direct poisoning, electrocution (from collisions with power lines), collisions with wind turbines, reduced food availability and habitat change affecting European populations (Donázar et al. 2002; Kurtev et al. 2008; Zuberogoitia et al. 2008; Carrete et al. 2009; Dzhamirzoev and Bukreev 2009; Sara et al. 2009). Illegal poisoning of carnivorous mammals appears to be the main threat at breeding sites in Spain (Hernandez and Margalida 2009) and in the Balkans. Within the European Union, regulations introduced in 2002 to control the disposal of animal carcasses have significantly reduced food availability. However, recently adopted regulations will allow the operation of feeding stations (feeders). Poisoning is a threat to the species, often through the use of poison baits targeting terrestrial predators (Carrete et al. 2007; Carrete et al. 2009; Cortés-Avizanda et al. 2009) and through the consumption of poisoned animals. Recent analyses from several countries such as Spain (Lemus et al. 2008) and Bulgaria (Angelov 2009) have identified prominent levels of species contamination leading to increased mortality. Antibiotic residues present in the carcasses of intensively farmed animals may increase the susceptibility of offsprings to disease (Lemus et al. 2008, Kurtev et al. 2008). Mortality following impacts on power lines was found to be particularly common in the Canary Islands (Donazar et al. 2002, Donazar et al. 2007a) and potentially dangerous in other regions of Spain (Donazar et al. 2007b, 2010b). Competition for suitable nest sites with Gyps fulvus may reduce breeding success in the short term (Kurtev et al. 2008).

The proposed conservation actions, according to the IUCN, are as follows:

- Intensive cooperation with local agencies to ensure poison-bait and poaching-free zones in locations with high densities of the species throughout the breeding and migration season.
- Extensive research into the causes of declining populations of the species throughout its range.
- Marking electric poles in areas where high mortality is recorded.
- Coordinate monitoring of population trends of the species throughout its distribution range.
- Establish supplemental feeding sites where needed, especially in locations where immature individuals congregate.
- Reduce poisoning risks by enforcing a strict ban on poison baits to control 'noxious' mammals.
- Effective impact assessments of wind farms before they are built.
- Reduction of disturbance at nesting sites.
- Seizure of live birds illegally held and attempts to breed them in captivity and future reintroduction programs.

Golden Eagle - Aquila chrysaetos

Until the 1960s the golden eagle was widely distributed in almost all the mountains of mainland Greece and on several islands. Its current distribution is limited to some mountainous and semi-mountainous areas of Thrace and Macedonia, in the Pindos Mountain range up to the Sterea, and in a few places in the Peloponnese and Evia. On the islands it is found in Crete and possibly in the Cyclades (Syros) (Handrinos and Akriotis 1997). Its population in the 1980s was in the range of 150-200 pairs. (Handrinos 1987a) with a decreasing trend, since in 1990 it was estimated at 140-180 pairs (Tucker and Heath 1994), while today it is estimated at 100-150 pairs. (BirdLife International 2004), of which 60 individuals or 16- 22 pairs. exist in Crete (Xirouchakis 2001). The Cretan population is reported to belong to the subspecies A. c. homeyeri, although its exact taxonomic classification needs investigation (Handrinos 1987a).

According to Poirazidi (2017), the number of spatial ranges of the species in the National Park of Dadia - Lefkimi - Soufli in the year 2012 was 4.

According to the IUCN Red List, the European population of the species is estimated at 9,600-12,800 pairs (19,200-25,600 mature individuals), while the EU28 population is estimated at 5,200-6,300 pairs (10,400-12,500 mature individuals). The Greek population is estimated at 100-160 pairs (BirdLife International 2021).

The species is protected under Directive 2009/147/EK (Annex I) and the Bern (Annex II) and Bonn (Annex II) Conventions. According to the Greek Red Data Book, the species is classified in Greece as Endangered (EN), while according to the IUCN it is listed at European level as Least Concern (LC) (BirdLife International 2021). It is also not listed by BirdLife International as a species of European interest in terms of conservation, although it is protected by the CITES Convention (Appendix II).

The population of the species in Greece represents about 1% of the European population.

The species is found in mountainous areas with rocky outcrops where it nests (Handrinos and Akriotis 1997). It prefers open areas with little vegetation and avoids forests, although it may live in wooded areas, using gaps for foraging (Adamakopoulos et al. 1995). It is mainly found in mountainous and semi-mountainous areas, while in summer it is often observed in the alpine zone (Xirouchakis 2001). It nests mainly on rocks (800-2,000 m) (Handrinos 1987a), but also on trees, e.g., in the forest of Dadia (Hallmann 1989). Its diet consists mainly of birds, small and medium-sized mammals, reptiles, and carrion, especially in winter (Vaglianos 1981; Handrinos 1987a; Hallmann 1989; Handrinos and Akriotis 1997). In mainland Greece, especially in Macedonia and Thrace, golden eagles very often feed on turtles, which they throw from high up on rocks to break their shells (Handrinos and Akriotis 1997), while in Crete newborn lambs are sometimes part of their diet (Xirouchakis 2001). It lays 1-2 eggs in early March and incubates them for 45-47 days. Chicks fledge after about two months. The territory of a pair is about 80-100 km2 (Hallmann 1980, Xirouchakis 2001). In Crete, the reproductive success of the species has been estimated at 0.51 chicks/territory/year, with a frequency of one successful attempt every two years (Xirouchakis 2001).

The main threats to the species are poaching (especially in Crete, where for this reason immature individuals are observed in 1/3 of the pairs), the illegal use of poisoned baits and the degradation of its feeding habitats (mainly the abandonment of mountainous crops), as well as, at a local level, the overharvesting of certain basic food species, such as partridges, hares, etc. Extensive reforestation and natural reparcelling of abandoned land also cause problems for the species.

Protected species, with much of the breeding population in Greece occurring in areas of the SPA/Natura 2000 network.

Conservation measures required: Strict control of illegal use of poisoned baits and poaching, systematic census of the Greek population, management, and protection of feeding areas (e.g. restoration of terraces and agri-environmental measures for the revival of mountain crops), artificial feeding (feeders), reduction of predation pressure on prey species, identification of the most productive territories and their more effective protection, public information and awareness raising.

According to the threats recorded in the list of threats to the species (Dimalexis 2009), the reported threats to the species are:

- Adaptive and stabled livestock farming
- Tourism - recreation infrastructure (skiing, golf, golf courses, courses, camps)
- Extractive activities - quarries – mines
- Renewable energy: Wind farms
- Transmission lines (electricity, telephone), oil and gas pipelines
- Illegal use of poisoned baits to control "harmful" mammals
- Persecution by specific users as harmful
- Nuisance activities (hunting, logging, fishing, plant, and firewood collection)
- Nuisance recreational activities, changes in the frequency and intensity of forest fires (increase or decrease)
- Construction of dams and flood protection interventions, irrigation networks
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming

- Land reparcelling.
- Changes in the extent and distribution of habitats due to climate change

The threats listed on the IUCN red list are wind energy, whose production facilities pose a direct threat of mortality to the species (Watson 2010). Also, poisoning, poaching, and trapping have led to population declines in Spain (Katzner et al. 2012a). In the past the species was affected by the use of strong pesticides, although this is not a significant problem today. There are records of mortality as a result of electrocution when colliding with power lines, but there are no data to suggest a significant demographic effect. In addition, reforestation, long-term changes in food availability, including declining livestock numbers, and climate change may threaten the species in the future (Watson 2010).

The proposed conservation actions, according to the IUCN, are as follows:

- Enforce protection of the species in many countries from illegal poaching and egg collection.
- Implement educational programs that demonstrate the benefits and feasibility of maintaining healthy populations of the species.
- General land use policies in remote mountain areas should not compromise basic feeding and nesting requirements.
- Need to protect extensive areas of forest peatlands in NE Europe.
- Need for more information on numbers and stability of unmonitored populations (Tucker and Heath 1994).

Lesser spotted eagle (Clanga pomarina)

The lesser spotted eagle (Clanga pomarina) is a widespread, locally rather common summer visitor and transient migrant in Greece. A much more common species and with a wider distribution in pre-war years, it now nests in Thrace, Macedonia, Thessaly, and Epirus (until recently it also nested in Central Greece) (Handrinos and Akriotis 1997). The breeding population in Greece is estimated at 67-90 pairs (the majority of which in Evros), with a decreasing trend (Chandrinos 1992, Handrinos and Akriotis 1997, BirdLife International 2004, EOE data, Papandropoulos prospectively).

According to Poirazidi (2017), the number of the species' territories in the National Park of Dadia - Lefkimi - Soufli in 2012 was 17.5.

Most widespread during the autumn migration, when several individual, mainly young individuals are observed in the south-western Peloponnese, Crete, etc. Four lesser spotted eagles ringed in Slovakia (2), Germany and Poland were found in Heraklion, Crete, Zakynthos, Aegina and Korinthia (Akriotis and Chandrinos 2004).

The European population of the species is estimated to number 10.800 - 15.200 pairs (34.200 - 46.200 mature individuals). The Greek population of the species is estimated to number 70 - 90 pairs, corresponding to <1% of the European population (BirdLife International 2021).

The species is protected under Directive 2009/147/EC (Annex I) and the Bern (Annex II) and Bonn (Annex II) Conventions. In Greece, the species is classified as Endangered (EN) in the Greek Red Data Book, while at the European level it is listed as Least Concern (LC) by the IUCN (BirdLife International 2021). It is also not classified by BirdLife International as a species of European interest in terms of conservation (BirdLife International 2017), while it is also protected by the international CITES convention (Appendix II).

It is an eagle with a fairly specialised habitat, living in lowland and semi-deciduous forests (nesting in trees), but always close to freshwater wetlands (rivers, streams, marshes, wet meadows, etc.) where it finds its prey. It feeds on a wide variety of reptiles, amphibians, small mammals, birds, large insects and, rarely, carrion (Vlachos 1989, Zogaris et al. 2003). Birds are generally observed singly or in pairs but congregate around abundant food sources and migrate in flocks (Snow and Perrins 1998, Ferguson-Lees and Christie 2001, Porter and Aspinall 2010). Birds leave their breeding grounds between August and November and return in March and April (Snow and Perrins 1998, Ferguson-Lees and Christie 2001, Meyburg et al. 2014).

The most serious threat to the species is the progressive degradation and destruction of the freshwater wetlands on which it feeds, due to the intensification of agriculture (reforestation, plantation, and lowland forest clearance, etc.). Locally, it is threatened by human encroachment on nesting habitats, mainly through the operation of quarries, road construction, etc., and possibly by poaching and pesticides.

It is a protected species and most of its breeding population in Greece is found in SPA/Natura 2000 sites.

Specific management plans and effective protection of the areas where the species breeds, but especially of its feeding habitats, are required. Systematic monitoring of its populations is also needed.

According to the threats recorded in the list of threats to the species of designation (Dimalexis 2009), the reported threats to the species are:

- Transmission lines (electricity, telephone), pipelines, oil, gas
- Inappropriate forest management
- Noisy recreational activities
- Other nuisance activities (military exercises, scientific research, vandalism)
- Deforestation and logging
- Wetland drainage and other land reclamation works.
- Erosion control works, stream bed cleaning, embankments, embankments of lakeshores and stream beds.
- Destruction of riparian ecosystems
- Pollution from agrochemicals discharged into receiving waters, waterlogging of receiving waters.

The threats listed in the IUCN red list are habitat loss (particularly drainage of wet forests and grasslands and ongoing deforestation) and hunting (Ferguson-Lees and Christie 2001). The latter is particularly prevalent during migration, with potentially thousands of birds killed annually in southern Europe (Tucker and Heath 1994). It is also highly vulnerable to the effects of potential wind energy development (Strix 2012).

According to the IUCN, recommended conservation actions include:

- Conduct surveys focusing on monitoring population numbers during migration, identifying key migration sites, investigating habitat requirements (both nesting and foraging) and conservation measures for the species.
- Protect areas within migration corridors and avoid disturbance near nesting sites (Barov and Derhé 2010).
- Require large-scale conservation measures to protect breeding and foraging habitat (Tucker and Heath 1994).

Short toed Snake Eagle (Circaetus gallicus)

The species is particularly widespread in Europe, Africa, and Asia. In Europe, the breeding population is estimated at 9,900-16,000 pairs (19,800-31,900 adults), while in the EU28, according to the IUCN red list, the population is estimated at 6,800-10,400 pairs (13,700-20,700 adults). The Greek population is estimated at 350-600 pairs, representing 4% of the European population (BirdLife International 2021). The population of the species is estimated to have increased in recent years (IUCN red list).

The species is protected by Directive 2009/147/EK (Annex I) and the Bern (Annex II) and Bonn (Annex II) Conventions. According to the Greek Red Data Book, the species is classified in Greece as Near Threatened (NT), while according to the IUCN it is listed at European level as Least Concern (LC) (BirdLife International 2021). It is also not classified by BirdLife International as a species of European interest in terms of conservation, although it is protected by the CITES Convention (Appendix II).

The species spreads mainly in mainland Greece and some islands, although it does not breed on them. The distribution of the species extends to the southern Peloponnese, while the bulk of its population is in central and northern Greece (Handrinos and Akriotis 1997).

According to Poirazidi (2017), the number of the species' territories in the National Park of Dadia - Lefkimi - Soufli in the year 2012 was 38.5.

Individuals breeding in the Palaearctic are migratory, while the Southeast Asian population is resident. Most migratory individuals overwinter in northern Africa (Ferguson-Lees and Christie 2001), while individuals overwintering in eastern Africa move to India and surrounding countries, with small populations overwintering in southern Europe (Hagemeijer and Blair 1997) They migrate south between August and November and north between February and May (Ferguson-Lees and Christie 2001). During migration, Short-toed Snake Eagles are observed in individuals or pairs, but sometimes form groups of up to 12 individuals that soar 20 to 100 m above the ground (Snow and Perrins 1998; Ferguson-Lees and Christie 2001).

The habitats they use are found in warm, temperate, and tropical environments, and they have been observed at altitudes above 1,200 m but prefer areas with partial cover. They feed exclusively on reptiles and mainly on snakes. The nest is most often constructed relatively low in the tree. The species usually lays one egg.

The species has experienced significant population declines in Northern Europe due to habitat loss. It still appears to be poached in Malta and seems to be facing problems from the installation and operation of wind farms. It is listed as a species of limited interest, on the IUCN red list, due to its large geographical distribution, and is listed as near threatened in the Red Book of Threatened Vertebrates of Greece.

According to the threats recorded in the list of threats to the species (Dimalexis 2009), the reported threats to the species are:

- Expansion - intensification of annual crops
- Construction of roads of all categories, as well as railway lines
- Persecution by specific users as harmful
- Inappropriate forest management
- Nuisance recreational activities
- Other nuisance activities (military exercises, scientific research, vandalism)
- Deforestation and logging
- Changes in forest fire frequency and intensity (increase or decrease)
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming
- Pollution from agrochemicals discharged into water bodies, waterlogging of receptors.

The threats listed on the IUCN red list are changes in agriculture and land use, which have reduced the amount of suitable hunting habitat. In addition, snake populations have declined due to increased monoculture cultivation, destruction of plant barriers, pesticide use, abandonment of traditional forms of farming and subsequent deforestation. Habitat fragmentation has resulted from forest fires and road construction. The species is also at risk from poaching, nest destruction and impacts on power lines (Tucker and Heath 1994). Finally, the species is highly vulnerable to the effects of potential wind energy development (Strix 2012).

The proposed conservation actions, according to the IUCN, are as follows:

- Broad-scale habitat conservation measures for the species, including conservation of low-scale crops, conservation of plant barriers and reduction of pesticide use.
- Appropriate management of forest land, including maintaining old trees, preventing fires, and limiting forest road construction.
- Educational campaigns, targeting hunting organisations, to reduce poaching.
- Power lines should be marked or undergrounded to reduce conflicts in critical areas for the species.
- Maintain and improve monitoring of the species (Tucker and Heath 1994).

Booted eagle (Hieraaetus pennatus)

In Greece, the booted eagle is a summer visitor and a transient migrant, with a fairly wide distribution. It nests mainly in northern Thrace, northern Greece, northern Greece, northern Greece, northern Greece, northern Greece, northern Greece. Macedonia, North. Epirus and central Greece, where it is rather rare (Handrinos and Akriotis 1997).

The European population is estimated at 23,300-30,300 pairs (46,600-60,500 mature individuals), while in the EU28, according to the IUCN red list, the population is estimated at 20,300-23,900 pairs (40,600-47,800 mature individuals). The breeding population in Greece is estimated at 70-120 pairs, corresponding to <1% of the European population (BirdLife International 2021).

According to Poirazidi (2017), the number of territories of the species in the National Park of Dadia - Lefkimi - Soufli in 2012 was 21.5.

The species is protected by Directive 2009/147/EK (Appendix I) and the Bern (Appendix II) and Bonn (Appendix II) Conventions. According to the Greek Red Data Book, the species is classified in Greece as Endangered (EN), while according to IUCN it is listed at European level as Least Concern (LC) (BirdLife International 2021). It is also not classified by BirdLife International as a species of European interest in terms of conservation (BirdLife International 2017), while it is also protected by the International Convention on Trade in Endangered Species (CITES) (Appendix II).

The species is much more widespread during migration, especially in autumn, when several individuals are observed in Attica, southern Peloponnese, Crete, etc. Recently, a few individuals have been observed wintering in southern Greece (southern Peloponnese and Crete) (Chandrinos 1992, Handrinos and Akriotis 1997, EOE data).

The species is primarily migratory, and northern birds leave their breeding grounds in September and return in March and April (Orta and Boesman 2013). Birds tend to be found singly or in pairs, and even on migration rarely form groups of more than five and stay away from other predators (Ferguson-Lees and Christie 2001). The birds rise about 200-300 m above the ground when hunting (Brown et al. 1982). It is an open woodland species, preferring parts of open woodland, and has been recorded at altitudes up to 2,000 m. It nests in mid- and low-altitude forests (coniferous, deciduous, or mixed), alternating with scrub, grassland, 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. 1995). Nests are built in trees and are constructed of sticks and branches lined with fresh leaves. They are often reused every year. Normally two eggs are laid (Orta and Boesman 2013). Species with a dimorphism in the color of the adult plumage (whitish or brownish phase), it is estimated that about 60% of the Greek population belongs to the whitish phase (Handrinos and Akriotis 1997). It is, in general, a species that has not been sufficiently studied in our country.

It is mainly threatened by the intervention and degradation of the lowland and semi-mountainous forests where it nests (poor implementation of forestry practices, opening of roads, etc.), the reduction of its prey due to the ongoing intensification of agriculture (deforestation, destruction of plant barriers, pesticides, etc.) and possibly poaching during migration. It is a protected species, and most of its population is probably found in SPA/Natura 2000 areas. More effective forest management and protection of the species in its nesting areas is needed, together with the adoption and implementation of agri-environmental measures in its feeding areas. A systematic census of the breeding population in Greece, a study of its biology/ecology and an investigation of the threats it faces are also needed.

According to the list of threats to the species (Dimalexis 2009), the reported threats to the species are:

- Expansion - intensification of annual crops, residential development (urban or extra-urban, legal, or arbitrary)
- Commercial - industrial development (ports, airports, industrial zones)

- Renewable energy (wind farms)
- Transmission lines (electricity, telephone), oil and gas pipelines
- Improper forest management
- Deforestation
- Changes in the frequency and intensity of forest fires (increase or decrease)
- Construction of dams and flood control measures (irrigation networks)

The threats listed on the IUCN red list are habitat degradation, direct persecution, human disturbance of habitats (Ferguson-Lees and Christie 2001) and deforestation. Habitat loss is also due to urbanization and wildfires. Pesticide accumulation can affect the reproductive success of the species (Tucker and Heath 1994). It is also very vulnerable to the effects of potential wind energy development (Strix 2012).

The proposed conservation actions, according to the IUCN, are as follows:

- Conservation and protection of extensive areas of alternating open habitats and mature forests.
- Any afforestation or deforestation should take place outside the breeding season.
- Education programs and legislation aimed at reducing illegal persecution and destruction of nesting and egg collection sites.
- Modify the design of power transmission lines to avoid bumps and electrocution.
- Research the distribution, numbers, habitat, population dynamics, and diet of the species, and the impact of pesticides on reproductive success (Tucker and Heath 1994).

Black Stork (Ciconia nigra)

The Black Stork is a rare and local visitor and a passing migrant in Greece. Although it was probably never a common species even in the past, it breeds today in northern Greece, mainly in Thrace (especially in Evros), Macedonia, Epirus, Epirus, locally in Thessaly, and Lesvos (6-8 pairs). The total population in Greece is estimated at 70-100 pairs. (of which about 50 pairs breed in Evros), with stable trends. An estimated 35 pairs of the species breed in the forest of Dadia (Alexandrou 2011).

The European population of the species is estimated at 10,100 - 16,200 pairs (20,200 - 32,400 mature individuals), while in the EU28, according to the IUCN red list, it is estimated at 6,600 - 10,400 pairs (13,300 - 20,700 mature individuals). The Greek population is estimated to number 110-170 pairs, corresponding to 1% of the European population (BirdLife International 2021).

The species is protected by Directive 2009/147/EK (Annex I) and the Bern (Annex II) and Bonn (Annex II) Conventions. According to the Greek Red Data Book, the species is classified in Greece as Endangered (EN), while according to the IUCN it is listed at European level as Least Concern (LC) (BirdLife International 2021). It is also not classified by BirdLife International as a species of European interest in terms of conservation (BirdLife International 2017), while it is also protected by the International Convention on Trade in Endangered Species (CITES) (Appendix II).

During migration it has a wider distribution but remains rare. There are no counts during the migration period, although the presence of small or medium-sized flocks is not uncommon in northeastern Greece. The maximum count in Greece was about 400 individuals in the Evros Delta (15-9-2006), while in autumn small flocks or individuals migrate south via the Peloponnese (maximum count of a flock of 11 individuals over Lake Kaiafas, 8-9-1984) or Crete (Handrinos and Akriotis 1997). Two individuals ringed in Croatia and the Czech Republic were found at Messolonghi and Heraklion, Crete, respectively (Akriotis and Chandrinos 2004).

It is a relatively shy and much less anthropophilic species than the white stork (Ciconia ciconia). It nests solitarily, far from settlements, usually in trees and less often on rocks, in hilly, semi-mountainous areas, with coniferous, deciduous, or mixed forests, valleys, clearings, small crops, etc, but always in the vicinity of freshwater wetlands (streams, marshes, wet meadows, etc.), where it finds its prey. The species is found from sea level to 2.000 m altitude. It generally avoids large bodies of water and dense forests. Outside the breeding season it frequents wetlands, coastal or inland, often in association with white storks, herons, etc. It feeds mainly on small fish, reptiles, and amphibians (especially frogs), small mammals and, more rarely, small birds. It is a monogamous species. It has one oviposition per year and the female lays 3-5 eggs. It is a species that has not been well studied in Greece (Handrinos and Akriotis 1997). The species is migratory. During migration it travels either singly or in small groups of up to 100 individuals (Snow and Perrins 1998). The species can use nests of other birds and usually reuses the same nest for consecutive years (Billerman et al. 2020).

It is threatened mainly by inappropriate forest management practices (afforestation, clear-cutting, opening of forest roads, etc.), but especially by the degradation and destruction of the wetland habitats where it feeds (browsing, draining of swamps, creation of streams, etc.), the reduction of its prey due to pollution, disturbance, collision with power lines, etc.). Protected species, many breeding population in Greece is found in SPA/Natura 2000 network areas. Management and protection of both nesting and foraging habitats is required (adoption and implementation of agri-environmental measures, conservation of wetlands, etc.), systematic census of the breeding population in Greece and study of the biology and ecology of the species, as well as its migratory movements in Greece.

According to the threats recorded in the list of threats to the species (Dimalexis 2009), the reported threats to the species are:

- Expansion of crops in wetlands
- Livestock grazing in wet grasslands.
- Mining activities quarries – mines
- Construction of roads of all categories, including railways
- Transmission lines (electricity, telephone), oil and gas pipelines
- Illegal use of poisoned baits to control 'harmful' mammals
- Accidental killing by hunting or poaching
- Improper forest management
- Disturbing activities (hunting, logging, fishing, plant, and firewood collection)
- Construction of dams and flood protection interventions, irrigation networks
- Wetland drainage and other land reclamation works.
- Pollution from agrochemicals discharged into water bodies, waterlogging of receptors.

Threats listed on the IUCN red list include habitat degradation of the species (Hancock et al. 1992, Lohmus and Sellis 2003, Diagana et al. 2006). The area of suitable habitat available for breeding is being reduced through deforestation (Elliot et al. 2014), particularly the destruction of large traditional nesting trees (Hancock et al. 1992). Rapid development of industry and agriculture, dam construction (Balian et al. 2002), drainage of lakes for irrigation and hydropower generation, desertification and pollution caused by the concentration of pesticides and other chemicals are major threats to the species. The species is also occasionally killed by collisions with power lines and poaching in southern Europe (especially during migration) has caused a decline in the population.

The proposed conservation actions, according to the IUCN, are as follows:

- Maintaining large mature trees during forest management is important for providing nesting sites (Lohmus and Sellis 2003).
- Conservation measures aimed at increasing the reproductive success and population density of the species should cover large areas of mainly deciduous forest, should focus on river quality management up to 20 km from nesting sites, should aim to protect and manage foraging habitats and improve food availability by creating shallow artificial water bodies along rivers or in grasslands (Jiguet and Villarubias 2004).
- Monitor breeding, migration, wintering numbers and ecological changes in the species' key habitats.
- Undergrounding or marking of power cables.
- Prevent poaching and overfishing of fish.

Greater spotted eagle (Clanga clanga)

Distribution, population data and trends: The spotted eagle is an uncommon and local winter visitor in Greece. It inhabits the large wetlands of northern and central Greece, with larger populations in the Evros Delta (and neighbouring hills), Amvrakikos, Kerkini and the Nestos Delta, while it is very rarely observed in more southerly areas. The annual wintering population averages 70-80 individuals, 80% of which are young and immature birds. The maximum population of the species in Greece (47 individuals) was recorded in the Evros Delta in 2008 (Chandrinos 1992, Handrinos and Akriotis 1997). One individual that had been ringed in Greece was found in Latvia (Akriotis and Chandrinos 2004).

The European population of the species is estimated at 960 - 1,300 pairs (1,900-2,500 mature individuals), while in the EU28 the population is estimated at 18 - 31 pairs (36 - 70 pairs) (BirdLife International 2021).

Percentage of the population of the species found in Greece: Approximately 50% of the species' wintering population in the Balkans (excluding Turkey) (Ferguson-Lees and Christie 2001).

The species is protected by Directive 2009/147/EK (Annex I) and the Bern (Annex II) and Bonn (Annexes I and II) Conventions.According to the Greek Red Data Book in Greece and the IUCN at European level, the species is classified as endangered (EN and VU respectively) (BirdLife International 2021). It is also classified as a SPEC 1 species of European interest in terms of protection by BirdLife International (BirdLife International 2017) and is also protected by the International Convention CITES (Appendix II).

Ecology: Found almost exclusively in large wetlands with riparian forests, stands of large trees, etc., or adjacent to wooded hills where it roosts, often with other eagle species, away from human settlements (Tucker and Heath 1994). It nests 5-25 m above the ground and the nest is reused in successive years, although many pairs have two or three nests that are used interchangeably. It feeds mainly on waterfowl, often injured by predators, and less commonly on other vertebrates, large insects and carrion (Alivizatos et al. 2004,0 Alivizatos et al. 2006). It is a migratory species, leaving its breeding grounds in October and November and returning in February and March.

Threats: The main threats to the species are degradation of wetlands, logging of large tree stands and clearing of lowland and riparian forests. The species is also locally threatened by disturbance, poaching, poisoning by lead shot and possibly poisoned bait.

Conservation measures in place: Protected species, the entire wintering population in Greece is found in SPA/Natura 2000 network sites.

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

According to the recorded threats in the list of threats to the species designation (Dimalexis 2009) the reported threats to the species are:

- Expansion - intensification of annual crops
- Hunting-poaching-trapping-collection of eggs or offsprings-nest destruction
- Molting by buckshot
- Wetland drainage and other land reclamation works.
- Erosion control works, cleaning of stream beds, embankments of lakeshores and gullies.
- Urban wastewater pollution
- Pollution from agrochemicals discharged into receiving waters, waterlogging of receiving waters.
- Solid wastes and wastes

The threats listed in the IUCN Red List are evidence of hybridisation between this species and Clanga pomarina (Bergmanis et al. 1997, Lohmus and Vali 2001, Dombrovski 2002, Vali et al. 2010). In a few European countries, mixed pairs may account for 50% of species pairs (Maciorowski and Mizera 2010) or even more (Vali 2011). It is not clear whether this is a new phenomenon or a conservation concern, but C. pomarina is much more abundant than C. clanga in the overlap zone, and the range of C. pomarina appears to be expanding eastwards, further into the range of Clanga clanga. Other major threats include habitat destruction and disturbance, poaching and electrocution. Suitable habitat mosaics have been lost through deforestation and wetland drainage. In Eastern Europe, intensification of agricultural practices and abandonment of traditional lowland floodplain management have reduced habitat quality. The species is particularly sensitive to permanent human presence in its territory. Finally, deliberate, and accidental poisoning throughout its range is a major threat to the species.

The proposed conservation actions, according to the IUCN, are:

- Research on the species' range and establish long-term monitoring programs to improve our understanding of population trends.
- Improve understanding of the species' breeding habitat requirements.
- Protect breeding areas, particularly from wetland drainage.
- Conservation of traditional wet grasslands
- Forestry regulation to minimize disturbance and protect potential nesting trees.
- Further investigate the threat of hybridization of the species with C. pomarine
- Prevent poaching, poisoning and impacts on power lines.
- More general awareness.

Eurasian Eagle Owl - Bubo bubo

The species is endangered with an estimated European population of 18,500 - 29,800 pairs (37,100 - 59,500 pairs), while the EU28 population is estimated at 13,000 - 18,200 pairs (26,000 - 36,400 mature individuals) according to the IUCN Red List. According to the same source, the species is listed as Least Concern (LC). The Greek population is estimated at 300-700 pairs, representing 2% of the European population (BirdLife International 2021).

The species is protected by Directive 2009/147/EK (Appendix I) and the Bern Convention (Appendix II) and is listed as a species of Least Concern (LC) according to the Greek Red Data Book in Greece and the IUCN at European level (BirdLife International 2021). It is also classified by BirdLife International as a SPEC 3 species of European interest in terms of conservation (BirdLife International 2017) and is also protected by the international convention CITES (Appendix II).

The species is distributed throughout mainland Greece, with a sparse distribution from Thrace to the Peloponnese, and on the islands, it nests on Lesbos (Pieper 1981, Handrinos and Akriotis 1997).

The species occurs mainly in rocky areas with cliffs and gorges, caves, parts of forests, scattered trees, and groves. It also uses river valleys with gorges, forests and fields with suitable rocky areas or cliffs and abandoned quarries for feeding. For nesting, the species prefers sheltered rocks or crevices on steep slopes, in the ground or in cave entrances. It occasionally uses old tree nests of other species for nesting and rarely nests in tree holes. Its diet consists of mammals, from small rodents to rabbits and heron-sized birds, but also includes frogs, reptiles, fish, and larger insects.

According to the threats recorded in the list of threats to the species (Dimalexis 2009), the reported threats to the species are:

- Tourism - recreation infrastructures (ski resorts, golf courses, golf courses, camps)
- Mining activities: quarries – mines
- Transmission lines (electricity, telephone), oil and gas pipelines
- Hunting - poaching - trapping - collecting eggs or chicks - destroying nests.
- Illegal use of poisoned baits to control 'harmful' mammals
- Improper forest management
- Disturbing activities (hunting, logging, fishing, plant, and firewood collection)
- Construction of dams and flood protection interventions, irrigation networks
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming
- Expansion - intensification of annual crops
- Residential development, urban or extra-urban, legal, or arbitrary

The threats listed on the IUCN red list are human activity. It is an extremely sensitive species, and the slightest disturbance can cause nest abandonment. Recreational activities such as skiing and mountaineering lead people to unknown nesting sites of the species (Tucker and Heath 1994). It also suffers from poisoning and impacts on overhead cables (power, telephone).

The recommended conservation actions, according to the IUCN, are as follows:

- Protect nesting sites from development and extensive logging (Holt et al. 2013).
- Increase public awareness of the species' sensitivity to human disturbance (e.g., birdwatchers, photographers) (Tucker and Heath 1994)
- Enhancing the protection of the species

Ortolan Bunting - Emberiza hortulana

The European population of the species is estimated at 3,610,000-5,630,000 pairs (7,220,000-11,300,000 adults), while in the EU28 the population is estimated at 1,030,000-1,750,000 pairs (2,060,000-3,500,000 adults). The Greek population of the species is estimated to number 20,000-50,000 pairs, which corresponds to about 1% of the European population (BirdLife International 2021). The population is estimated to be in decline due to ongoing habitat destruction. Between 1980 and 2013, the European population experienced a sharp decline (EBCC 2015), and the population trend is described as decreasing.

The species is protected by Directive 2009/147/EK (Annex I) and the Bern Convention (Annex III) and is classified as Least Concern (LC) by the Greek Red Data Book in Greece and by IUCN at European level (BirdLife International 2021). It is also classified by BirdLife International as a SPEC 2 species of European conservation concern (BirdLife International 2017). In Greece, the Ortolan Bunting is a summer visitor.

The species has a wide distribution throughout mainland Greece, while on the June and Aegean islands it breeds only in Crete and possibly in Samothrace (Handrinos and Akriotis 1997).

This species uses a variety of breeding habitats, preferably found in areas with a continental climate (long hours of sunshine and low rainfall). In the northern part of its breeding range, it occurs in cultivated fields, preferring low-intensity, mixed agricultural fields on light soils, with sparse vegetation and scattered trees or rows of trees or shrubs. In its southern breeding range, it occurs in open mountainous areas with sparse shrubs up to 2,400 m (Hagemeijer and Blair 1997; Madge and Sharpe 2016). The species arrives in breeding areas from Africa, where it winters, in April. The nest is built by the female, usually on the ground, and she lays 4-5 eggs. Autumn migration usually takes place from mid-August to mid-September (Madge and Sharpe 2016). The species' diet consists of seeds (cereals or grasses), and during the breeding season the species feeds on invertebrates such as ants, beetles, and grasshoppers, both on the ground. It collects its food primarily on the ground and often near shrubs or trees that provide cover (Cramp 1998).

According to the threats recorded in the list of threats to the species (Dimalexis 2009), the reported threats to the species are:

- Expansion - intensification of annual crops
- Reparcelling
- Residential development, urban or extra-urban, legal, or arbitrary
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming.

Threats listed on the IUCN red list are expansion - intensification of agriculture. The replacement of mixed, low-intensity and small-scale crops with large-scale crops, combined with the use of pesticides, results in a lack of suitable invertebrate-rich habitat (Menz and Arlettaz 2012). Other threats to the species include lack of nesting sites, accidental killing by hunting or poaching, and trapping of species during migration (Hagemeijer and Blair 1997).

The recommended conservation actions, according to the IUCN, are as follows:

- Draft an international action plan for the species, which includes protection during migration and wintering areas.
- Establish a ban on hunting and trapping of the species.
- Evaluation of the effectiveness of conservation measures (Bernardy 2009).

Middle Spotted Woodpecker (Leiopicus medius)

The European population of the species is estimated at 401,000-695,000 pairs (802,000-1,390,000 mature individuals), while in the EU28 the population is estimated at 802,000-1,390,000 pairs (602,000-1,070,000 mature individuals). The Greek population of the species is estimated at

10,000-30,000 pairs, corresponding to 3% of the European population (BirdLife International 2021). The species is found in Central and Eastern Europe. The population of the species is considered stable, although it is threatened by habitat destruction (Gorman 2004).

The species is protected by Directive 2009/147/EK (Annex I) and the Bern Convention (Annex II). According to the Greek Red Data Book in Greece and the IUCN at European level, the species is not classified as Least Concern (LC) (BirdLife International 2021). It is also not classified as a species of European conservation concern by BirdLife International.

The species has a wide distribution in mainland Greece from the Peloponnese and further north. It also breeds on Lesvos, where the only island population remains (Handrinos and Akriotis 1997).

For most of its range, it inhabits extensive, mature oak forests, or forests of other deciduous trees with a substantial proportion of large mature oaks. Clusters of oak stands belonging to Quercus petraea and Quercus cerris, about 100 years old, are considered the most ideal habitats for this species (Danko et al. 2002, Schmitz 1993). It also inhabits mixed deciduous forests, parks, riparian forests, and wooded pastures (Winkler et al. 1995), as well as in mixed deciduous-coniferous forests where it feeds on pine and spruce seeds (Cramp 1985). In Greece, it has exceptionally been observed in pure stands of black pine and cephalonia fir at high altitudes on the mainland, while in Lesvos it is common in olive groves (Handrinos and Akriotis 1997). The main factors influencing whether and to what extent an area can be a habitat for the species are the presence of old oaks and suitable trees for nesting (Pasinelli 2000a). Breeding of the species begins from mid-April to early May. It feeds on various species of insects that live on the bark and leaves of trees (Cramp1985). In winter when insect availability is low, it feeds on nuts, various fruits, and other plant foods (Heinze 1994). It is less affected by the presence of dead wood than other woodpeckers and is estimated to feed more on healthy rather than dead trees which it uses only for nesting (Pasinelli 2000b). It feeds at the highest crown height of mature oaks in very high proportions and prefers large, mature trees with large crowns (Pasinelli and Hegelbach 1997).

According to the threats recorded in the list of threats to the species (Dimalexis 2009), the reported threats to the species are:

- Whitewood crops

- Inappropriate forest management
- Deforestation
- Changes in habitat extent and distribution due to climate change

The threats listed in the IUCN red list are inappropriate forest management, particularly in terms of fragmentation of oak forests, removal of old and decaying trees and replacement of native deciduous trees with conifers. Also, the effects of air pollution may pose a risk to the species (Hagemeijer and Blair 1997). Finally, climate change and adverse weather conditions affect populations at local scales (Winkler et al. 2014).

The proposed conservation actions, according to the IUCN, are as follows:

- Conservation measures for the species
- Maintain suitable trees, within forested areas, for nesting and foraging.
- Maintain suitable land areas on a regional scale (Robles et al. 2007).
- Fully understand and evaluate the effects of air pollution on the availability and abundance of prey (arthropods) of the species (Hagemeijer and Blair 1997).

Eastern Orphean warbler (Curruca crassirostris)

According to the IUCN red list, the species has changed its classification and is listed in the Greek Red Book under the name Sylvia crassirostris (English common name, according to the IUCN red list, Eastern Orphean Warbler) rather than Sylvia hortensis (English common name, according to the IUCN red list, Western Orphean Warbler) as it was previously listed, both on the website of the Hellenic Ornithological Society and in Portolou et al. 2009. Also, the species, according to the revised version of the IUCN red list (2021) has again changed classification and is referred to as Curruca crassirostris (English common name, according to the IUCN red list, Eastern Orphean Warbler).

The European population of the species is estimated at 65,900 - 206,000 pairs (131,000 - 411,000 mature individuals), while in the EU28, the population is estimated at 16,000 - 62,000 pairs (32,000 - 124,000 mature individuals). The Greek population of the species is estimated to number 5,000-10,000 pairs, corresponding to 6 % of the European population (BirdLife International 2021).

The species is protected by the Bern Convention (Appendix II) and the Bonn Convention (Appendix II). According to the Greek Red Data Book, the species has not been assessed in Greece and therefore does not have a threatened status (NE), while according to the IUCN it is listed at

European level as a species of Least Concern (LC) (BirdLife International 2021). It is also not listed as a species of European conservation interest by BirdLife International.

The species is found in open or semi-open broadleaf woods with bushy cover and long vegetation, but can also be found in open coniferous woods, olive groves or abandoned orchards and gardens, forest margins and vineyards. It breeds from April to July, laying 3 to 6 eggs. The nest is cup-shaped and made of various materials (e.g., plant and animal fibres, moss, spider webs). The species nests on the branches of low trees or in dense shrubbery, usually at a low height from the ground, often close to the nests of Lanius senator. It migrates to its wintering areas from July, reaching them (East Africa and southern Asia) in autumn (August to November, depending on location). Spring migration begins in late February to March, arriving at breeding sites in March (Billerman et al. 2020). The diet of this species consists of arthropods (adults and larvae) and berries. It has also often been observed to supplement its diet with nectar from flowers.

Threats listed on the IUCN red list are the degradation and loss of habitat for the species through intensification of agriculture and reduced grazing (Billerman et al. 2020). No conservation measures are currently required for the species.

Tawny Owl - Strix aluco

The Tawny Owl is a non-migratory Old-World species that lives and breeds permanently in the areas where it occurs. In Europe it is found in all countries except Ireland, Iceland, and the northern parts of Scandinavia. In Asia, the species is found in parts of the Near and Middle East, the Caspian Sea region, the mountainous areas around the Himalayas and especially in Korea and southern China. In Africa, it is found in the north-west of the continent, in the countries bordering the Mediterranean and the Atlantic.

In Europe, the breeding population is estimated at 632,000 to 932,000 pairs (1,260,000 to 1,870,000 mature individuals), while according to the IUCN red list in the EU28, the population is estimated at 437,000 to 638,000 pairs (874,000 to 1,280,000 mature individuals). The Greek population is estimated to number 10,000 - 20,000 pairs, which is 2% of the European population (BirdLife International 2021). According to the same source, the population trend of the species is stable.

The species is protected by the Bern Convention (Appendix II). According to the Greek Red Data Book, the species has not been assessed in Greece and is therefore Not Evaluate (NE), while according to the IUCN it is listed at European level as a species of Least Concern (LC) (BirdLife

International 2021). It is also not listed by BirdLife International as a species of European interest in terms of conservation and is also protected by the international CITES convention (Appendix II).

In Greece, the species is spread throughout mainland Greece, as well as on some large islands of the Aegean and the June Sea such as Lesvos, Ikaria, Corfu and Kefalonia. However, the species does not breed in Crete although it has been observed during the winter period (Handrinos and Akriotis 1997).

The Tawny Owl displays a racial dimorphism, with the female being 5% larger and 25% heavier than the male. Juveniles are strongly striated on the lower body surface. The Tawny Owl hunts entirely during the night, surveying the area from a fixed point, from which it silently pounces on its prey and, very rarely, seeks its prey in daylight, only when it is young to feed. Its diet includes a wide range of prey, forest rodents, but also mammals up to the size of a young rabbit, birds, frogs, earthworms, and beetles. Tawny Owls mate from their 1st year of life and usually stay together for life. The pair defend their living space year-round, with the boundaries remaining the same, or with slight change from year to year. The pair usually sits under cover, on a tree branch near the tree trunk, during the day, but roost separately from July to October. The roost can be revealed and disturbed by various small birds during the day, but Tawny Owls usually ignore them.

The nest is usually a hollow or hole in a tree, but also old nests of other birds such as the magpie, squirrel nests, holes in buildings and even artificial nest feeders. It very rarely nests in rocks or holes in the ground. It nests from February in the southern part of its range, but rarely before mid-March in the north (Scandinavia). In Greece, the Tawny Owl nests throughout the mainland and on a few numbers of forested islands. The largest recorded breeding populations in Europe are in Russia, Spain, Germany, Romania, Poland, and Spain, while the smallest are in the Nordic countries. The species appears to have expanded its range in Belgium, the Netherlands, Norway, and Ukraine, while populations are stable or increasing in most European countries. Declines have been recorded in Finland, Estonia, Italy, and Albania.

According to the list of threats to the species (Dimalexis 2009), the reported threats to the species are:

- Livestock overgrazing in mountainous, semi-mountainous and island pastures.
- Inappropriate forest management
- Disturbing activities (hunting, logging, fishing, collection of plants and fuelwood)

- Deforestation and logging
- Changes in the frequency and intensity of forest fires (increase or decrease)

Threats listed on the IUCN red list are competition in the north with Strix uralensis that may limit range expansion (Hagemeijer and Blair 1997). Locally, pesticide use and electrocution from impacts on power lines are also threats to the species (König 2008). Finally, low availability of food resources due to habitat destruction is another threat to the species. No conservation measures are currently required for the species.

Eastern Bonelli's Warbler (Phylloscopus bonelli orientalis)

The European population of the species is estimated at 3.400.000 - 3.180.000 pairs (4.800.000 - 6.360.000 mature individuals), while in the EU28, according to the IUCN red list, the population is estimated at 2.360.000 - 3.120.000 pairs (4.720.000 - 6.240.000 mature individuals) (BirdLife International 2021). The general population trend, worldwide, from 1989 to 2013 is stable (EBCC 2015). Most of the European population of the species is found in Russia. In Greece, the subspecies orientalis is found (mainly in mountain forests in Macedonia and Thrace, locally south to Oiti, Parnassus), which is considered a distinct species. The European population of the subspecies is estimated at 29,200 - 97,700 pairs (58,500 - 196,000 mature individuals), while in the EU28, the population is estimated at 14,000 - 37,100 pairs (28,000 - 74,100 mature individuals). The Greek population of the subspecies orientalis is estimated at 10,000 - 30,000, corresponding to 33% of the European population (BirdLife International 2021). In Europe, the overall trend from 1980 to 2011 shows an increase, based on provisional data for 27 countries (EBCC / RSPB / BirdLife / Statistics Netherlands).

The species is protected by the Bern Convention (Appendix II) and the Bonn Convention (Appendix II). According to the Greek Red Data Book, the species has not been assessed in Greece and is therefore Non evaluated (NE), while according to the IUCN it is listed at European level as a species of Least Concern (LC) (BirdLife International 2021). It is also not listed as a species of European conservation interest by BirdLife International.

The species is observed in northern Greece from Epirus, Thessaly, and further north. Previously, as mentioned above, breeding cases of the species have been reported further south as in Delphi, Parnassus and Oiti (Handrinos and Akriotis 1997). The Greek population, as mentioned above, belongs to the eastern race of P. b. Orientalis and is recognised by many as a separate species., The subspecies Phylloscopus bonelli Orienatlis is found at altitudes between 800 m and 1,800 m. It breeds in woods at different altitudes, in dense vegetation, in stands (Salix) in humid valleys and forests, of birch, willow, poplar and pine (Pinus). The species usually breeds between June and August. The nest is usually on the ground in dense vegetation and 5-6 eggs are laid. It feeds on small insects and other invertebrates. In Greece, the species is a summer visitor (late March to early October).

As for the threats facing the species, they remain unclear due to the lack of information on its ecology. According to the IUCN red list, climate change may cause problems and threaten the species in the future (Heikkinen 2006). Further research on aspects of the biology of this species is recommended (Konig 2008).

Syrian Woodpecker (Dendrocopos syriacus)

The species is non-migratory. The European population of the species is estimated at 322,000 - 767,000 individuals (645,000 - 1,540,000 mature individuals), while in the EU28 the population is estimated at 86,400 - 193,000 pairs (172,000 - 386,000 mature individuals). The Greek population of the species is estimated to number 10,000-25,000 pairs, corresponding to 3% of the European population (BirdLife International 2021).

The species is protected by Directive 2009/147/EK (Annex I) and the Bern Convention (Annex II). The species has not been assessed in the Greek Red Data Book and therefore does not have a threatened status Non-Evaluated (NE), while at European level it is listed as a species of Least Concern (LC) by IUCN (BirdLife International 2021). It is also not listed by BirdLife International as a species of European conservation interest (BirdLife International 2017).

The species has been observed at higher altitudes in northern and central (eastern Thessaly) Greece. It is quite common near villages and gardens or parks (Handrinos and Akriotis 1997).

The species is found in wooded areas adjacent to open areas, such as forest gaps, meadows, fields with scattered old trees, riverbank vegetation (willows and poplars). It is also common in plantations of all types, such as olive and avocado plantations in the south, vineyards in central Europe, where it is found in trees close to human-influenced ecosystems, as well as in wooded areas, parks, and gardens. Selection of suitable nesting sites is linked to the availability of mature trees close to areas rich in food resources (Tucker and Heath 1994). It nests in oak (Quercus sp.) trees in south-eastern Europe and has been observed breeding in coniferous forests at lower altitudes in Turkey. Nesting occurs from mid-April to May, rarely until June. The nest is excavated by both sexes, but by the male, on a log or large branch. Old nests are sometimes reused. The species lays between three and seven eggs (Winkler et al. 2014). The species is omnivorous, feeding on a variety of insects, snails, earthworms, fruits, berries, nuts, and seeds (Gorman 2004). It is a resident species in our country, occurring in northern Greece.

According to the list of threats to the species (Dimalexis 2009), the reported threats to the species are:

- Intensification of perennial crops (vineyards, orchards, olive groves, etc.)
- Land reclamation.
- Improper forest management
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming
- Afforestation
- Destruction of riparian ecosystems

Hybridisation with Dendrocopos major is listed as a threat on the IUCN Red List, but only if sufficient females of the species can colonize an area and the extent of hybridization becomes insignificant (Hagemeijer and Blair 1997). No conservation measures are currently required for this species.

Red backed Shrike (Lanius collurio)

The species has a wide distribution in mainland Greece, while it also breeds on some islands (e.g., Lemnos, Lesvos). It is common during autumn migration and more unusual during spring migration. In Europe, the breeding population is estimated at 8,210,000-13,000,000 pairs (16,400,000-26,000,000 mature individuals), while in the EU28 the population is estimated at 5,440,000-7,310,000 pairs (10,800,000-14,700,000 mature individuals). The Greek population is estimated to number 40,000-60,000 pairs, corresponding to <1% of the European population (BirdLife International 2021). From 1970 to 1990 there was a dramatic population decline in the western and northeastern breeding range (Harris and Franklin 2000).

The species is protected by Directive 2009/147/EK (Annex I) and the Bern Convention (Annex II) and is not assessed in the Greek Red Data Book and therefore does not have endangered status, Non-Evaluated (NE), while it is listed as Least Concern (LC) at European level by IUCN (BirdLife International 2021). It is also classified by BirdLife International as a SPEC 2 species of European conservation interest (BirdLife International 2017).

The species has a wide distribution in mainland Greece, but also breeds on some islands (e.g., Lemnos, Lesvos).

The species occurs in temperate and Mediterranean climates (Lefranc and Worfolk 1997). It prefers sunny, warm, usually dry, and gently sloping soils with scattered shrubs or low trees, open grasslands on slopes with scrub, in crops, on boundaries and in forest clearings, hedgerows and vineyards, which are also its foraging areas (Cramp and Perrins 1993, Tucker and Heath 1994). It is also found in rural areas, on land, open fields, open buildings, gardens, hedgerows and scrub along railways or motorways. It is also found in camps, burned forests and spruce (Picea) plantations (Yosef et al., 2012). Nesting occurs from May to July (Lefranc and Worfolk 1997) and the pair lays three to seven eggs. The nest consists of plant material such as grasses, lichens, grasses, mosses, reeds (Phragmites) and animal remain such as hair and fur. It is built in dense, thorny shrubs such as blackcurrant (Crataegus), bramble (Prunus spinosa), bramble (Rubus) or rosebush (Rosa) (Yosef et al. 2012). Its diet consists of insects and other invertebrates, small mammals, birds, amphibians, and reptiles. The species is migratory and spends the winter in eastern and southern Africa (Lefranc and Worfolk 1997).

In Greece, the Red-backed Shrike occurs as a summer breeding bird, but also as a transient visitor during the two migrations. It is reported from Crete as a summer visitor and from Cyprus as a migrant, with the possibility of nesting in Troodos. It migrates from about 500 to 1,500 m, but in some areas, it can climb even higher (e.g., Helmos, Katara). Conversely, it may also frequent areas at sea level (Thrace). Red-backed Shrikes settle in well-managed, sunny areas with clearings, sparse vegetation (e.g., herbaceous stands, grasslands, dry meadows) alternating with scattered shrubs and hedgerows, usually with less than 50% plant cover. Perches are required for hunting, surveillance, and foraging, with shrubs about 1-3 m high, mostly thorny (rosebushes, brooms, mulberries, etc.). The diet of the Red-backed Shrike consists of a wide range of prey, insects and small invertebrates or vertebrates, and the hunting techniques used depend on the prey. However, their diet also includes food of plant origin.

According to the list of threats to the species (Dimalexis 2009), the reported threats to the species are as follows:

- Expansion - intensification of annual crops
- Reparcelling
- Residential development (urban or extra-urban, legal, or arbitrary)
- Commercial-industrial development (ports, airports, industrial zones)

- Recreational tourism infrastructure (ski resorts, golf courses, golf courses, campsites)
- Construction of all types of roads and railways
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming
- Pollution from agrochemicals discharged into water bodies, waterlogging of receptors.

Threats listed in the IUCN Red List include loss and fragmentation of the species' habitat due to deforestation, agricultural intensification, and increased use of pesticides, resulting in the decline of its main food source (insects) (Yosef et al. 2012). Prominent levels of inorganic nitrogen fertilizer may also be a threat (Tucker and Heath 1994). The creation of cooler and milder summers also affects reproduction in northern and western regions (Yosef et al. 2012).

The IUCN recommends the following conservation actions.

- Promote low-intensity management, as the species requires large-scale habitat conservation.
- Management should include maintaining or creating open grasslands with alternating high and low vegetation and thorny scrub, maintaining vegetation barriers between crops, and creating them in intensively managed orchards and vineyards, and maintaining terrestrial areas.
- Reduction of pesticide use (Tucker and Heath 1994).

Olive tree Warbler (Hippolais olivetorum)

The species is a summer visitor in Greece, with an estimated European population of 10.700 - 23.900 pairs (21.500 - 47.700 mature individuals), while in the EU28, according to the IUCN red list, the population is estimated at 4.700 - 9.500 pairs (9.500 - 19.000 mature individuals). The Greek population is estimated to number 3,000 - 5,000 pairs, which is about 24 % of the European population (BirdLife International 2021). The species has a wide range of distribution throughout Greece (Handrinos and Akriotis 1997).

The species is protected by Directive 2009/147/EK (Annex I) and the Bern (Annex II) and Bonn (Annex II) Conventions and is classified in Greece as Near Threatened (NT) in the Greek Red

Data Book and as Least Concern (LC) at European level by IUCN (BirdLife International 2021). It is also not classified as a species of European conservation interest by BirdLife International.

The species has a wide distribution throughout the country (Handrinos and Akriotis 1997). It breeds in sparse oak woodland with scrubby clearings (Handrinos and Akriotis 1997, Tucker and Heath 1994), in tall scrub (holm oak) or olive groves, orchards and other plantations (almond trees, etc.), often on rocky slopes. It nests in dense bushes or on the branches of low trees, usually at a low height from the ground (30-350 cm) (Cramp 1998). The species breeds from May to June. It lays 3-4 eggs in a nest in a low tree or shrub. It remains well hidden and is difficult to observe. A summer visitor, sometimes arriving in late April (Svensson 2006). It is found in eastern and southern Africa, from southern Kenya to South Africa. It feeds on insects and other invertebrates, supplementing its diet with fruits (berries, figs) in summer.

According to the threats recorded in the list of threats to the species (Dimalexis 2009), the reported threats to the species are:

- Deforestation logging
- Changes in the frequency and intensity of forest fires (increase or decrease)
- Abandonment of traditional agricultural practices and land use including abandonment of extensive agriculture and livestock farming
- Pollution from agrochemicals discharged into water bodies, waterlogging of receptors.

The threats listed on the IUCN red list are changes in the habitat structure of the species, due to the clearing and thinning of forest areas and the intensification of agriculture. Also, the use of agricultural pesticides may reduce the species' food resources (insects). Finally, bird trapping in Greece may affect the species (Tucker and Heath 1994).

The proposed conservation actions, according to the IUCN, are as follows:

- Financing of olive oil production, which will favor old traditional plantations and their management.
- Studies examining the impact of agricultural and forestry intensification.
- Avoiding the use of broad-spectrum pesticides.
- Research into the population status of the species, and research into its ecological requirements (Tucker and Heath 1994).

Semicollared Flycatcher (Ficedula semitorquata)

The European population of the species is estimated at 30,100 - 149,000 pairs (60,300 - 297,000 mature individuals), while in the EU28 the population is estimated at 3,900 - 11,500 pairs (7,800 - 23,000 mature individuals). The Greek population is estimated to number 1,000 - 3,000, corresponding to 3 % of the European population (BirdLife International 2021).

The species is protected by Directive 2009/147/EK (Annex I) and by the Bern Convention (Annex II) and the Bonn Convention (Annex II). According to the Greek Red Data Book, there are insufficient data to assess its threatened status Data Deficient (DD) in Greece, while at European level it is listed as a species of least concern (LC) by IUCN (BirdLife International 2021). It is also classified by BirdLife International as a SPEC 2 species of European conservation interest (BirdLife International 2017).

In Greece, the Semicollared Flycatcher is a summer visitor. The distribution and population status of the species are poorly known. The species is observed in northern Greece from Epirus, Thessaly, and further north (Handrinos and Akriotis 1997). So far, nests of the Semicollared Flycatcher have only been found in Cholomontas, Preveza and the northern border in deciduous and coniferous forests.

The species prefers forested areas, mountain slopes of about 2,000 meters in height. It is found in mature deciduous trees, oak (Quercus spp.) and anchor (Carpinus spp.), in riverine and swampy forests of Frax (Fraxinus oxycarpa) and in places with plane trees (Platanus orientalis) (Handrinos and Akriotis 1997). Occasionally, species breed in old or abandoned orchards, olive groves and tree plantations, urban parks and large gardens or forested peripheral parts of cities, villages, and industrial areas (Iankov 2007). It breeds in tree hollows created by woodpeckers, but also in technical nests. However, technical nests cannot replace the loss of suitable breeding habitat. Breeding takes place from mid-April to mid-July. The female builds the nest and usually lays 5-6 eggs. The diet of the species consists of insects, as well as spiders and snails. The species is migratory and winters in southern and central Africa (Hagemeijer and Blair 1997).

According to the threats recorded in the list of threats to the species (Dimalexis 2009), the reported threats to the species are:

- Whitefish
- Construction of roads of all categories, including railways
- Inappropriate forest management
- Deforestation logging
- Destruction of riparian ecosystems

Threats listed in the IUCN Red List include habitat destruction in some areas. Oak (Quercus spp.) forests in Bulgaria (the species' preferred habitat in that country) have been overexploited for timber, and coastal forests have been cleared for riverbed engineering. In eastern Turkey, the coastal forest habitat is threatened by ongoing dam construction projects, and the rapid loss of oak forests may also have a negative impact on this species.

- The IUCN recommends the following conservation actions.
- Develop a program to monitor population trends of the species.
- Assess threats to the species and develop appropriate actions.
- Forest management practices within the species' range should consider the habitat requirements of the species.
- Ensure that Natura 2000 sites and other protected areas are adequately protected from threats and that management plans are implemented.

Cretzschmar's Bunting (Emberiza caesia)

The species is a summer visitor in Greece, with an estimated European population of 115.000 - 226.000 pairs (230.000 - 451.000 mature individuals), while in the EU28, the population is estimated at 15.000 - 40.000 (30.000 - 80.000 mature individuals). The Greek population is estimated at 5,000 - 20,000 pairs, which is about 6 % of the European population (BirdLife International 2021).

The species is protected by Directive 2009/147/EC (Annex I) and the Bern Convention (Annex II). According to the Greek Red Data Book in Greece and the IUCN at European level, the species is not classified as Least Cocern (LC) (BirdLife International 2021). It is also not classified as a species of European interest in terms of protection by BirdLife International.

The species is quite common in the coastal areas of southern and central Greece, on the Aegean and Ionian islands. In northern Greece it has been observed in Chalkidiki and Thassos, while it is absent from Crete and Karpathos. (Handrinos and Akriotis 1997). In Crete there is some unconfirmed information about the presence of the species on the southern coast.

Typical species of areas with topsoil, low maquis, and rocks, as well as cultivated areas. It is found from sea level to 1,000 m, usually (not always) at lower altitudes than the bladderwrack, below 1,350 m, mostly in coastal areas (Hagemeijer and Blair 1997; Madge 2011). Optimal foraging habitat for this species consists of rocky slopes with sparse vegetation (toadflax or low macaw) (Brooks 1998, Handrinos and Akriotis 1997). It breeds on sunny, dry, bare slopes that combine rocky outcrops, grass and thorny shrubs and lays 4-6 eggs. The nest is constructed by the female and placed on the ground on a rock or among the roots of bushes. It ranges around the southern Red Sea (Madge 2011). Sits on the ground and on low rocks, but also on low bushes when singing and not shy. Its diet consists of seeds, and juveniles also feed on insects (Cramp 1998) and other small invertebrates, ants (Madge 2011). The male has a grey head and striations on the back. Its ventral region is orange, and its beak is pink. Females and offsprings have fewer striations.

According to the threats recorded in the list of threats to the species (Dimalexis 2009), the reported threats to the species are:

- Livestock overgrazing in mountainous, semi-mountainous and island pastures.
- Residential development, urban or extra-urban, legal, or arbitrary
- Changes in fire frequency and intensity (increase or decrease)
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming
- Changes in habitat extent and distribution due to climate change

No threats to the species are listed on the IUCN red list, but no conservation measures are currently required for the species.

Sardinian Warbler (Curruca melanocephala)

The species is non-migratory, with an estimated European population of 7.730.000 - 16.100.000 pairs (15.400.000 - 32.100.000 mature individuals), while in the EU28 the population is estimated at 6.920.000 - 13.700.000 pairs (13.800.000 - 27.300.000 mature individuals). The Greek population is estimated to number 500,000 - 620,000 pairs, corresponding to 5% of the European population (BirdLife International 2021).

The species is distributed throughout the Mediterranean region, with almost half of its population occurring in Spain. Portugal, Turkey, Italy, and Greece also have significant populations. The species has a wide distribution range throughout Greece (Handrinos and Akriotis 1997).

The species is protected by the Bern Convention (Appendix II) and the Bonn Convention (Appendix II). According to the Greek Red Data Book, the species has not been assessed in Greece and is therefore Not Evaluated (NE), while according to the IUCN at European level it is listed as Least Concern (LC) (BirdLife International 2021). It is also not listed as a species of European conservation interest by BirdLife International.

It is 13-14 cm long and weighs 11-13.6 g. The male has a distinctive black-olive head, greyish white neck, and greyish white body. It has a red ring around the eye and the iris is greyish red.

The species occurs in all types of warm habitats at low altitudes up to 1,200-1,300 m. It prefers open scrub and open coniferous woodland with scattered shrubs. It can also be found on the edges of scrubland with open agricultural land, in parks and gardens with small plane trees, but also in arboriculture (almond groves), orchards, vineyards and olive groves. It nests in the lower part of bushes at a height of 0.75-1.35 ha. It is a monogamous species. It lays 3-5 eggs twice a year, from April to June. The nest is a grass cup, usually placed 30-60 cm above the ground in bushes or small trees. Incubation is shared by both sexes and lasts about 13 (12-15) days. The offsprings leave the nest after 12-13 days and become independent after 2-3 weeks. Sexual maturity occurs the following year. It feeds on grubs and insect larvae but supplements its diet with fruit in autumn and winter.

According to the threats recorded in the list of threats to the species (Dimalexis 2009), the reported threats to the species are:

- Residential development, urban or offsite, legal, or arbitrary
- Changes in the frequency and intensity of forest fires (increase or decrease)

The threats listed on the IUCN red list are extreme winter weather conditions, especially in the northern areas of the species' range, which can affect its survival, to the point that in some cases we have a reduction of up to 50% in the reproduction rate. Threats to the species also include degradation and destruction of critical habitat for the species. The degradation is based on the frequent occurrence of large fires in the species' breeding habitats, as well as the cutting and removal of vegetation and shrubs.

The proposed conservation actions, according to the IUCN, are as follows:

- More detailed ecological studies and monitoring surveys of the species (Pomeroy and Walsh 2002)

Black headed Bunting (Emberiza melanocephala)

The species is a summer visitor in Greece. The European population of the species is estimated at 2.470.000 - 8.940.000 pairs (4.950.000 - 17.900.000 mature individuals), while the EU28 population is estimated at 280.000 - 561.000 pairs (561.000 - 1.130.000 mature individuals). The Greek population of the species is estimated at 40,000 - 50,000 pairs, which corresponds to about 1% of the European population (BirdLife International 2021).

The species is protected by the Bern Convention (Appendix II). According to the Greek Red Data Book, the species has not been assessed in Greece and is therefore Not Evaluated (NE), while according to the IUCN it is listed at European level as a species of least concern (LC) (BirdLife International 2021). It is also not listed as a species of European conservation interest by BirdLife International.

The species has a wide distribution in the mainland, on the Ionian and Aegean islands, except for the smaller islands, while in Crete the population is small (Handrinos and Akriotis 1997).

The species is common in rural areas in all of mainland and island Greece. It is found in distinct types of crops, such as olive groves, wheat fields, vineyards and open hillsides with scattered trees and shrubs. It nests in low vegetation. The vine grouse is a migratory species. Its geographic range is quite small and, limited to a thin zone extending from the height of the central Mediterranean, roughly, eastwards to the Middle East, then breaking off to continue into the Indian subcontinent, where the wintering grounds are located.

It breeds in open bushy areas, with thorny plants, with scattered trees, but also on cultivated land, field margins and rarely in woodland. In Greece it is found in uncovered areas with scattered shrubs and trees, olive groves, groves and gardens, vineyards, and wheat fields. It is often observed surveying the area on telephone poles or at the top of tall trees. The species is found up to 2,100 m altitude (Hagemeijer and Blair 1997, Copete 2016). The breeding season begins in mid-May and lasts until about the end of June, and nesting occurs once. In the habitats where they breed, they build their nests in dense poles, shrubs, thorny bushes, or vineyards, low from the ground or even on it, rarely in trees 2-3 m high. The nest is a cup-shaped structure made of grass, dry leaves, and flower heads, topped with fine grass, sheep's wool, and hair inside. Only the female takes part in its construction (Cramp and Perrins 1993). She lays 4-5, rarely 6-7 eggs, with incubation being carried out by the female alone and lasting about 14 days. The offsprings feed mainly on insects and become capable of flight at about 10 days. During the breeding season it feeds on invertebrates and to a lesser extent on seeds and other plant materials (Copete 2016).

It migrates in flocks, with males arriving at wintering sites before females. It travels in small flocks of 10-50 individuals (Byers et al. 1995). All populations head SE towards West and Central India. Occasionally, winter visitors are reported in intermediate areas, e.g., Israel. In spring, it arrives in Turkey (a major breeding territory) mostly from late April and has sometimes been reported in Cyprus as early as March, but usually arrives in early or mid-April, with travel continuing until mid-May. It arrives in the Aegean islands and the Republic of North Macedonia in late April and early May. In Greece, the Black headed Bunting is a migratory bird, occurring throughout the country during the summer, when it comes to nest.

According to the threats recorded in the list of threats to the species (Dimalexis 2009), the reported threats to the species are:

- Expansion - intensification of annual crops
- Intensification of perennial crops (vineyards, orchards, olive groves, etc.)
- Intensive and stabled livestock farming
- Land consolidation.
- Accidental killing by hunting or poaching
- Pollution from agrochemicals discharged into water bodies, waterlogging of receptors.

According to the IUCN, the species is threatened by the expansion and intensification of agriculture. Practices such as the destruction of hedgerows and shrubs and the heavy use of pesticides on crops have a negative impact on the species. Changes in land use and the replacement of olive groves by maize fields and fruit orchards can also have a negative impact on the species' breeding habitat (Hagemeijer and Blair 1997).

According to the IUCN, the recommended conservation actions are as follows.

- Conservation of the species' habitat in breeding areas (Brambilla 2015).

Eastern subalpine warbler (Curruca cantillans)

Much of the world's breeding population of the species is found in Europe. It breeds in Spain, but also in Croatia and France, with smaller populations in most Mediterranean countries.

The species is a summer visitor to Greece, with the European population estimated at 3.520.000 – 5.320.000 pairs (7.040.000 – 10.700.000 mature individuals), while the EU28 population is estimated at 3.490.000 – 5.230.000 pairs (6.980.000 – 10.500.000 mature individuals). The Greek population is estimated at 100,000-140,000 pairs, representing 3% of the European population (BirdLife International 2021).

The species has a wide distribution throughout Greece (Handrinos and Akriotis 1997).

The species is protected by the Bern Convention (Appendix II) and the Bonn Convention (Appendix II). According to the Greek Red Data Book, the species has not been assessed in Greece and therefore does not have a threatened status Not Evaluated (NE), while according to the IUCN at European level it is listed as a species of Least Concern (LC). It is also not listed as a species of European conservation interest by BirdLife International.

It is 12-13 cm long and weighs 5-12.4 g male and 8-10.3 g female. The male has grey on the upper body, orange deep to reddish on the neck and chest on the upper body, orange deep to reddish on the neck and chest. It has a red ring around the eye and a very distinctive white moustache. Its flight is short in duration with a chirp.

The species prefers high and dense brushwood vegetation in dry, Mediterranean areas. It is also found in sparse broadleaf forests with a dense understory and in dense shrubland. It uses shrubby formations dominated by (Rubus fruticosus) along sunny canyons and valleys and prefers intermediate stages of succession after wildfires. The breeding season begins from late March to late June and the species is monogamous. Both sexes build the nest which is a deep cup lined with grasses and roots and is placed in low shrubbery or a small tree. The species lays 3-5 eggs. Incubation is carried out by both sexes and lasts 11-12 days. The offsprings leave the nest at the age of 11-12 days. The species' diet consists of small insects, but outside the breeding season it supplements its diet with fruits and berries. The species overwinters in sub-Saharan Africa (Aymi et al. 2015). In Greece it arrives in early spring (March - April) and migrates in late summer (August - September).

According to the list of threats to the species (Dimalexis 2009), the reported threats to the species are:

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

The main threats to the species are related to the degradation and loss of critical habitat. The degradation is due to the frequent occurrence of large fires in the species' breeding habitats and the cutting and removal of hedges and shrubs. No conservation measures are currently required for the species.

European Green Woodpecker (Picus viridis)

The European population of the species is estimated at 603,000 - 1,030,000 pairs (1,200,000 - 2,050,000 mature individuals), while the EU28 population is estimated at 529,000 - 894,000 pairs (1,050,000 - 1,790,000 mature individuals). The Greek population is estimated at 5,000 - 10,000, representing <1% of the European population (BirdLife International 2021).

The species is protected under the Bern Convention (Appendix II). According to the Greek Red Data Book, the species has not been assessed in Greece and therefore have Not Evaluated status (NE), while according to the IUCN it is listed as Least Concern (LC) at European level (BirdLife International 2021). It is also not listed as a species of European conservation interest by BirdLife International.

The species breeds throughout Europe, except in Scotland, Ireland, northern Scandinavia, and northern Russia. It is a resident species in Greece and is quite common in northern Greece (Thrace, Macedonia, Thessaly), while it is rarer in central Greece and the Peloponnese (Handrinos and Akriotis 1997).

The species is found in mature and open woodland, broadleaved, in semi wooded areas and agricultural fields with scattered trees, in gardens and parks in semi-urban areas and in orchards. It nests in holes drilled in trees and the entrance to the nest is almost circular, measuring 6 x 7 cm (Cramp 1985). The species lays five to seven eggs in March-April. Incubation lasts 17-19 days and takes place by both sexes. The offsprings leave the nest at 23-27 days and become independent at 3-7 weeks. They become sexually mature at the age of one year. The diet of this species consists of ants, which it catches both on tree trunks and on the ground. Other insects, such as earthworms and snails, as well as reptiles, fruits, berries, and seeds are rarely eaten. The species is resident throughout most of its range, although local winter movements occur in some areas (Winkler and Christie 2015).

According to the list of threats to the species (Dimalexis 2009), the reported threats to the species are as follows:

- Reparcelling
- Improper forest management
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming

- Reforestation
- Destruction of riparian ecosystems
- Changes in habitat extent and distribution due to climate change

Threats listed on the IUCN red list are the intensification of agriculture and forestry and the conversion of pasture to arable land, which significantly reduces ant populations (Winkler and Christie 2015). Also, intensive forestry has resulted in the loss of nesting sites (Tucker and Heath 1994). Finally, adverse weather conditions during winter can cause severe mortality, the effects of which can last for years and may be exacerbated by the effects of other threats (Winkler and Christie 2015; Tucker and Heath 1994; Hagemeijer and Blair 1997).

The proposed conservation actions, according to the IUCN, are as follows:

- Conservation of nesting and foraging habitats. Retain old trees for nesting in woodlands, orchards and maintain foraging habitats such as small grasslands, pastures, orchards, and heathland (Tucker and Heath 1994).

Black eared Wheatear (Oenanthe hispanica)

The species is a summer visitor to Greece, with the European population estimated at 1.260.000 – 3.630.000 pairs (2.530.000 – 7.250.000 mature individuals), while in the EU28, according to the IUCN red list, the population is estimated at 451.000 – 1.190.000 pairs (902.000 – 2.380.000 mature individuals). The Greek population is estimated at 100.000-190.000 pairs, representing 6% of the European population (BirdLife International 2021).

The species is protected under the Bern Convention (Appendix II) and the Bonn Convention (Appendix II). According to the Greek Red Data Book, the species has not been assessed in Greece and therefore have a Not Enaluated status (NE), while according to the IUCN it is listed at European level as a species of Least Concern (LC) (BirdLife International 2021). It is also not listed as a species of European conservation interest by BirdLife International.

The species is found throughout mainland and island Greece, except for the high mountain peaks of Pindos and Rodopi (Handrinos and Akriotis 1997).

The species breeds in warm climatic zones, on stony and bushy areas between Olea and Pistacia shrubs, in fallow fields, in olive groves and vineyards, on slopes with dense long vegetation and on the borders of open juniper (Juniperus) or oak (Quercus) woodlands. It is usually found at low altitudes, below 500 m, sometimes higher (e.g., Crete up to 1,500 m). In mainland Greece, the species is usually found in areas with more vegetation and at lower altitudes than Oenanthe oenanthe. Breeding starts from the end of April in Spain and from the beginning of May in Greece and Armenia. The nest is a flat cup of stems and mosses, placed on the ground under stones, on rocky outcrops, in burrows or in holes in ruins. The species' diet consists of invertebrates, berries, and seeds. It ranges south of the Sahara. It uses observation posts up to three meters from the ground.

According to the list of threats to the species (Dimalexis 2009), the reported threats to the species are as follows:

- Expansion - intensification of annual crops
- Reparcelling
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming

Threats listed on the IUCN Red List include drought, agricultural intensification, and deforestation (Collar 2005). Local threats include fox and feral dog mortality (Tucker and Heath 1994).

The IUCN recommended conservation actions are as follows.

- Maintenance of extensive sheep and goat farming (Tucker and Heath 1994).

Western Rock Nuthatch (Sitta neumayer)

The species is non-migratory in Greece, with an estimated European population of 1.010.000 - 5.060.000 pairs (2.030.000 - 10.200.000 mature individuals), while in the EU28 the population is estimated at 11.200 - 31.500 pairs (22.400 - 63.000 mature individuals). The Greek population is estimated to number 10,000 - 30,000 pairs, corresponding to <1% of the European population (BirdLife International 2021).

The species is protected by the Bern Convention (Appendix II). According to the Greek Red Data Book, the species has not been assessed in Greece and therefore is Not Evaluated (NE), while according to the IUCN it is listed at European level as a species of Least Concern (LC) (BirdLife International 2021). It is also not listed by BirdLife International as a species of European conservation interest.

The species is common in southern and central Greece and rarer or even absent in Macedonia and Thrace (Handrinos and Akriotis 1997). Typical bird in castles and archaeological sites in southern

Greece (e.g., Delphi, Acrocorinth, Monemvasia). Absent from most islands (despite suitable habitat, the exception being Lesvos and in the Ionian Sea on Corfu, Lefkada and Zakynthos).

The species is found in rocky, limestone areas with scattered bushes and trees, even in old buildings or other human constructions. It selects sites with bare cliffs, usually rocky slopes, and canyons in dry, arid areas, and is occasionally found in woodlands with scattered rocks. It is usually found at low and mid-elevations in dry areas. The breeding season is from late March to April or May. The nest is built by the male and has a remarkable flask-shaped structure with an entrance tunnel up to 10 cm long and is usually placed under a slight overhang or sometimes in a building or other artificial structure. It is made of mud, animal dung and feathers. In the summer season the species' diet consists of insects and in the autumn, it supplements its diet with seeds and snails (Snow and Perrins 1998). The species is sedentary, showing limited dispersal after breeding (Hagemeijer and Blair 1997).

According to the threats recorded in the list of threats to the species (Dimalexis 2009), the reported threats to the species are:

- Tourism infrastructure - recreation (ski resorts, golf courses, camps)
- Mining activities: quarries – mines
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming

No threats to the species are listed on the IUCN red list, but no conservation measures are currently required for the species.

Eastern Imperial Eagle (Aquila heliaca)

Distribution, population data and trends: Common in Greece and widely distributed species in the pre-war years and until the 1960s, 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 nests (Handrinos and 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, in the large wetlands of northern Greece (Evros Delta, L. Kerkini, Kalamas Delta, etc.). A few individuals, juveniles, migrate south in autumn along the Ionian coast (Messolonghi, western Peloponnese, etc.) (Chandrinos 1992, Handrinos and Akriotis 1997).

There are 10 recoveries in Greece of ringed individuals in Hungary (5), Slovakia (4) and Bulgaria (Akriotis and Handrinos 2004).

The European population of the species is estimated at 1,900 - 3,000 pairs (3,900 - 6,000 mature individuals), while in the EU28 the population is estimated at 270 - 390 pairs (540 - 770 mature individuals) (BirdLife International 2021).

Percentage of the population of the species found in Greece: <1% of the European (wintering) population.

The species is protected by Directive 2009/147/EK (Appendix I) and the Bern (Appendix II) and Bonn (Appendices I and II) Conventions and is classified as Critically Endangered (CR) in Greece according to the Greek Red Data Book, and as Least Concern (LC) at European level according to IUCN (BirdLife International 2021). It is also classified by BirdLife International as a SPEC 1 species of European interest in terms of conservation (BirdLife International 2017) and is also protected by the international CITES convention (Appendix I).

Ecology: The only species of the genus Aquila that lives in lowland/semiplain habitats. In Europe it has been pushed to higher altitudes due to persecution and habitat loss. In Central and Eastern Europe, it breeds in forests up to 1.000 m altitude. It nests in trees in lowland and riparian forests and forages in open steppe areas and crops, while in winter it frequents large wetlands. From late February to early May adults return to breeding areas. During the breeding season it feeds on small to medium-sized mammals, reptiles, and birds, while in winter it feeds on waterfowl, often also on carrion (Adamakopoulos et al. 1995). European ground squirrels 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.

Conservation measures in place: Protected species, the entire wintering population is found in SPA/Natura 2000 network areas. In the area of the Dadia National Park it benefits from the vulture feeder.

Conservation measures required: Conservation of the species in Greece should focus on both wintering areas and breeding pairs that are likely to be found. In neighboring countries (Bulgaria, the Republic of North Macedonia) there are several pairs of the species and thus the Eastern Imperial Eagle could recolonize Greece. The possibility of breeding the species in captivity should also be investigated as a long-term objective, with the aim of reintroducing it to Greece. Strict control of the illegal use of poisoned baits and poaching is also needed, as well as public information.

The reported threats to the species, according to the list of threats to species of conservation concern (Dimalexis 2009), are as follows:

- Expansion - Intensification of annual crops
- Renewable energy: Wind farms
- Construction of all types of roads and railways
- Transmission lines (electricity, telephone), oil and gas pipelines
- Hunting - poaching - trapping - collecting eggs or chicks - destroying nests.
- Illegal use of poisoned bait to control nuisance mammals.
- Harmful stalking by certain users
- Inappropriate forest management
- Disturbing activities (hunting, logging, fishing, collecting plants and firewood)
- Disturbing recreational activities
- Deforestation Logging
- Changes in the frequency and intensity of forest fires (increase or decrease)
- Construction of dams and flood control structures, irrigation networks
- Changes in habitat extent and distribution due to climate change

Threats listed in the IUCN Red List include intensive forest exploitation, which threatens breeding sites in mountainous areas, and lack of large trees in the lowlands. Other threats include loss and alteration of foraging habitats, scarcity of small and medium-sized game species (especially the European ground squirrel), human disturbance of breeding sites, poaching and illegal trade, poisoning, and electrocution from collisions with power lines. Finally, along the species' migratory routes, the main threats are poaching, poisoning and prey depletion.

Suggested conservation actions, according to the IUCN, are as follows:

- Conduct surveys to identify breeding and wintering sites and migration corridors.

- Implement forestry policies that benefit the species, such as maintaining large trees in open areas and protecting old-growth forest on slopes.
- Prevent mortality from nest destruction and collection, electrocution by medium-voltage power lines, and general persecution in wintering areas and migration corridors.
- Preserve foraging habitat (maintain traditional land use).
- Increase prey numbers of the species through management of foraging habitats.
- Public awareness and stakeholder involvement in conservation activities.

White tailed Eagle (Haliaeetus albicilla)

The European population of the species is estimated at 10,400 - 14,600 pairs (20,900 - 29,200 mature individuals), while the wintering population is estimated at 10,900 - 17,600 individuals. In the EU28, the population is estimated at 4,800-6,300 pairs (9,600-12,600 mature individuals). The Greek population of the species is estimated at 8-10 pairs, representing <1% of the European population (BirdLife International 2021).

Norway and Russia account for more than 55% of the European population. The species in Greece is non-migratory and is found in all the large wetlands of northern Greece (Evros Delta, Lakes Vistonida and Mitrikou, Nestos Delta, Lakes Kerkini and Koroneia, Aliakmonas Delta) (Handrinos and Akriotis 1997).

The species is protected by Directive 2009/147/EK (Appendix I) and the Bern (Appendix II) and Bonn (Appendices I and II) Conventions and is classified as Critically Endangered (CR) in Greece according to the Greek Red Data Book, and as Least Concern (LC) at European level according to IUCN (BirdLife International 2021). It is also not classified by BirdLife International as a species of European interest in terms of conservation (BirdLife International 2017), while it is also protected by the CITES International Convention (Appendix I).

The White-tailed Eagle used to have a wide distribution and nested in many areas of mainland Greece, even on some islands: Until the early 1960s, for example, there were 10-12 pairs in the Evros Delta alone (Handrinos and Akriotis 1997). Today, the species only nests in a few large wetlands in Thrace and eastern and central Macedonia. In the large wetlands of northern Greece, especially in the Evros Delta, a population of White-tailed Eagle regularly winters, young and immature birds with an average of 8-10 individuals per year. A rare species in southern Greece and on the islands, with only a few records to date (Lesvos, Crete, etc.), from individuals migrating along the coasts of Asia Minor (Chandrinos 1992; Handrinos and Akriotis 1997; Helander and Stjernberg 2002).

In Greece, the species is found in large wetlands (river deltas, lagoons, lakes) and nests in large trees, in riparian and other lowland forests. It feeds on fish and waterfowl, often injured by hunters, but also on mammals, carrion, etc. However, little is known about the biology and ecology of the species, especially during the breeding season. It is threatened by the degradation of wetlands and lowland forests, as well as by poaching, poisoned bait, lead poisoning from buckshot and possibly heavy metal poisoning, etc. It is a species that is particularly sensitive to disturbance during the nesting season, a period during which it may also face problems of food shortage, which explains the low reproductive success of the species in Greece. As a protected species, the entire breeding and wintering population in Greece is found in SPA/Natura 2000 sites. Locally, as in the Dadia National Park, it also benefits from the vulture feeder. Strict protection of all pairs and nesting, wintering, and feeding areas of the species is needed, especially regarding poaching and the use of lead shovels in wetlands. There is also a need to investigate threats to the species, such as the effects of heavy metals, and to study its reproductive biology and ecology. The provision of supplementary food (feeders), at least for some pairs, during the summer period should also be investigated.

The reported threats to the species, according to the list of threats to species of conservation concern (Dimalexis 2009), are as follows:

- Expansion - intensification of annual crops
- Residential development, urban or extra-urban, legal, or arbitrary
- Commercial - industrial development (ports, airports, industrial zones)
- Tourism - recreational infrastructure (ski resorts, golf courses, campsites)
- Construction of all types of roads and railways
- Hunting - Poaching - Trapping - Collecting eggs or chicks - Destroying nests.
- Illegal use of poisoned bait to control 'nuisance' mammals
- Accidental killing through hunting or poaching
- Inappropriate forest management
- Lead poisoning from buckshot.
- Disturbing activities (hunting, logging, fishing, collecting plants and firewood)

- Harmful recreational activities
- Other disturbing activities (military exercises, scientific research, vandalism)
- Changes in frequency and intensity of forest fires (increase or decrease)
- Drainage of wetlands and other land reclamation projects
- Erosion control works, streambed cleaning, embankment of lakeshores and streambeds.
- Abandonment of traditional agricultural practices and land uses, including extensive agriculture and livestock farming
- Pollution from industrial or military activities
- Pollution from agrochemicals discharged into receiving waters, waterlogging of receiving waters.
- Solid waste and litter

Threats listed on the IUCN red list include wetland loss and degradation, human disturbance and persecution, environmental pollution, conflict with wind turbines (Krone and Scharnweber 2003) and indiscriminate use of poison baits and pesticides. Also, modern forest management methods reduce the availability of suitable habitat (Orta et al. 2013).

The recommended conservation actions, according to the IUCN, are as follows:

- Prevent loss of nesting and foraging habitat due to inappropriate forestry.
- Protection of nesting sites from human disturbance/destruction and egg collection.
- Take measures against poaching and the use of poisoned baits to control 'noxious' predators.
- Providing food at feeding stations (feeders) in some areas will aid juvenile survival and increase reproductive success rates (Tucker and Heath 1994).

Osprey (Pandion haliaetus)

The European population of the species is estimated at 9,600-13,600 pairs (19,200-27,100 mature individuals), while the EU28 population is estimated at 6,000-7,800 pairs (12,100-15,500 mature individuals) (BirdLife International 2021).

The species is protected under Directive 2009/147/EK (Annex I) and the Bern (Annex II) and Bonn (Annex II) Conventions. According to the Greek Red Data Book in Greece and the IUCN at European level, the species is not classified as Least Concern (LC) (BirdLife International 2021). It is also not classified by BirdLife International as a species of European interest in terms of conservation (BirdLife International 2017), and it is also protected by the CITES International Convention (Appendix II).

The species is a transient visitor in Greece and is observed during migration in coastal wetlands and islands and not so much in inland waters or rivers. In Crete it is often observed at high altitude crossing the large mountain ranges of the island (Handrinos and Akriotis 1997).

The species occurs in a wide variety of habitats. The presence of water near the nesting sites is essential for finding food. It nests near shores, lagoons, river deltas and lakes. It breeds from late May to early September and most pairs are monogamous. The nest is placed in trees (up to 30 m from the ground) and on cliffs. It lays 1-4 eggs. The diet consists entirely of fish (Poole et al. 2014). The species migrates over long distances and is not dependent on stopover sites during migration (Snow and Perrins 1998, Ferguson-Lees and Christie 2001). Migratory birds begin their migration at lower latitudes from August to October and return during March to April. (Ferguson-Lees and Christie 2001).

According to the list of threats to species of conservation concern (Dimalexis 2009), the reported threats to the species are as follows:

- Recreational tourism infrastructure (ski resorts, golf courses, camps)
- Persecution by certain users as harmful
- Inappropriate forest management
- Disturbing activities (hunting, logging, fishing, collection of plants and firewood)
- Deforestation logging
- Drainage of wetlands and other land reclamation projects
- Pollution from agrochemicals discharged into receiving waters, waterlogging of receiving waters.

The threats listed on the IUCN red list are the historical human persecution that prevailed from the 18th to the 20th century (Ferguson-Lees and Christie 2001). A combination of deforestation and the collection of eggs and live birds led to the species becoming extinct in Azerbaijan (Poole et al. 2014). The species' population declined from 1950-1970 because of pesticide use, although it is now recovering, and this threat is not considered significant. In Scotland, the species was extirpated by collecting and hunting, but is now recovering (Poole et al. 2014, Ferguson-Lees and Christie 2001). The species is very vulnerable to the impacts of potential wind energy development (Strix 2012).

The proposed conservation actions, according to the IUCN, are as follows:

- Reduce disturbance of nesting sites by creating protection zones with a radius of 200-300 m around them.
- Providing artificial nesting sites where feasible would aid breeding success.
- Reduce water pollution.

Long legged Buzzard (Buteo rufinus)

The species is non-migratory in Greece, with local migratory populations (in northern Greece). The European population of the species is estimated at 13,800 - 22,900 pairs (27,600 - 45,800 adults), while in the EU28, according to the IUCN red list, the population is estimated at 1,100 - 2,100 pairs (2,300 - 4,200 adults) and is increasing. The Greek population is estimated to number 200-300 pairs, corresponding to 1% of the European population (BirdLife International 2021).

The species is protected by Directive 2009/147/EK (Appendix I) and the Bern (Appendix II) and Bonn (Appendix II) Conventions and is classified in Greece by the Greek Red Data Book as Vulnerable (VU), while it is listed at European level by IUCN as Least Concern (LC) (BirdLife International 2021). It is also not classified by BirdLife International as a species of European interest in terms of conservation (BirdLife International 2017), while it is also protected by the CITES International Convention (Appendix II).

According to Poirazidi (2017), the number of the species' territories in the National Park of Dadia - Lefkimi - Soufli in 2012 was 1.5.

The species lives in open dry bushy areas with topsoil, sparse macchia, meadows, extensive crops, near suitable nesting sites in rocks, gorges, and mountains up to 1,600 m altitude. The species builds its nests primarily on cliffs but sometimes uses trees in rural areas (Hagemeijer and Blair 1997) and power poles (Tucker and Heath 1994). Nests can be reused, and the species may also use old nests of other birds. It usually lays 2-4 eggs (Billerman et. al. 2020). Foraging habitat includes steppe, semi-arid areas with fringing vegetation. It feeds preferentially on small mammals, but its diet is supplemented with lizards, snakes, small birds, and large insects (Tucker and Heath 1994). In Greece, the Long-legged Buzzard is a non-migratory and partially migratory species. It has a wide distribution but is found locally mainly in the eastern part of Greece (Thrace, An. Macedonia, Thessaly, etc.) and is scarcer in western Greece and the Peloponnese. It also nests on many Aegean islands, even on small ones, but its (possible) nesting on Crete has not yet been proven. A part of the population, especially birds nesting in Northern Greece, migrate from our country. Those birds that migrate from northern Europe move to North Africa and southern Asia leaving their breeding grounds in August and September and returning in March and April (Billerman et al. 2020). They are observed singly, in pairs or in small family groups, but during migration when they can they form larger flocks (Ferguson-Lees and Christie 2001).

According to the threats recorded in the list of threats to the species of conservation concern (Dimalexis 2009), the reported threats to the species are:

- Intensification of perennial crops (vineyards, orchards, olive groves, etc.)
- Residential development (urban or extra-urban, legal, or arbitrary)
- Tourism and leisure infrastructure (ski resorts, golf courses, golf courses, golf courses, campsites)
- Transmission lines (electricity, telephone), oil and gas pipelines
- Disturbing activities (hunting, logging, fishing, plant, and firewood collection)
- Nuisance activities recreation
- Abandonment of traditional agricultural practices and land use including abandonment of extensive agriculture and livestock farming
- Pollution from agrochemicals discharged into receiving waters, waterlogging of receiving waters.

The threats listed on the IUCN red list are the destruction of its habitats through agricultural intensification resulting in a reduction of the prey that is part of its prey. The species is also very vulnerable to the effects of potential wind energy development (Strix 2012). Finally, death by collision with power lines is another threat to the species.

The proposed conservation actions, according to the IUCN, are as follows:

- Environmental Impact Assessment for new wind farm developments,
- Power interconnection lines to be more visible.
- Ensure conservation of the species' habitats, as well as the species' prey populations

Bonelli's Eagle (Aquila fasciata)

The species is non-migratory, with the European population estimated at 1,000 - 1,300 pairs (2,100 - 2,500 mature individuals), while in the EU28 the population is estimated at 1,000 - 1,200 pairs (2,100 - 2,400 mature individuals). In Greece, the population is estimated to number 100 - 140 pairs, which corresponds to about 10 % of the European population (BirdLife International 2021).

The species is protected by Directive 2009/147/EK (Annex I) and the Bern (Annex II) and Bonn (Annex II) Conventions and is classified in Greece as Vulnerable (VU) in the Greek Red Data Book, and as Least Concern (LC) at European level by IUCN (BirdLife International 2021). It is also classified by BirdLife International as a SPEC 3 species of European interest in terms of conservation (BirdLife International 2017) and is also protected by the CITES International Convention (Appendix II).

In Greece, the species is found in western and southern Greece and the Peloponnese, with a high density of pairs in Mani. On the islands, it is distributed throughout the Aegean, Crete, the Cyclades, and the Dodecanese (Handrinos and Akriotis 1997, Bourdakis and Xirouchakis 2009).

The species in Greece is non-migratory. The distribution of the species in Greece coincides in general with the distribution of the Chukar Partridge and the European rabbit, which are its main prey on the islands (Handrinos and Akriotis 1997). Some pairs in mainland Greece are isolated, but populations in some areas (mainly on the Aegean islands) are particularly dense.

Typically, a Mediterranean eagle species. The species is found in open rocky habitats (such as rocky coasts and rain islands) with sparse macro vegetation and toadstools, in pine forests and evergreen forests alternating with habitats with small dry low-intensity crops from sea level to 1. 500 m elevation (Tucker and Heath 1994; Hagemeijer and Blair 1997). Mature individuals typically occupy areas near large aquatic ecosystems (Ferguson-Lees and Christie 2001). In the Mediterranean region, spawning occurs from February to mid-March. (Orta et al. 2016). The nest has been reused for successive years (Ferguson-Lees and Christie 2001). The diet consists of small to medium-sized birds, but will also hunt mammals, some reptiles, and insects (Ferguson-Lees and Christie 2001).

According to the threats recorded in the list of threats to the species of conservation concern (Dimalexis 2009), the reported threats to the species are:

- Residential development, urban or unplanned, legal, or arbitrary
- Tourism - recreation infrastructure (ski resorts, golf courses, golf courses, golf courses, camps)
- Extractive activities: quarries – mining
- Renewable energy: Wind farms
- Construction of all types of roads and railways
- Transmission lines (electricity, telephone), oil and gas pipelines
- Pursued by specific users as harmful.
- Disturbing activities (hunting, logging, fishing, gathering of plants and firewood)
- Changes in the frequency and intensity of forest fires (increase or decrease)
- Construction of dams and flood protection interventions, irrigation networks
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming
- Changes in habitat extent and distribution due to climate change

The threats listed on the IUCN red list are pesticide use, which has affected the species in the mid-20th century and since then populations have not recovered. Since the 1950s, the species' populations have declined throughout its range. Juveniles also suffer from collisions with power lines (Rollan et al. 2010). Finally, declining prey availability, increased human disturbance and poaching in breeding areas along with agricultural intensification are considered key factors in the species' population decline (Ferguson-Lees and Christie 2001, Orta et al. 2016).

The proposed conservation actions, according to the IUCN, are as follows:

- Require the implementation of access restrictions and legal habitat protection in nesting areas to avoid disturbance and destruction of these habitats.
- Undergrounding and/or marking of power pole interconnection cables.

- Maintain extensive livestock and agriculture, as well as maintaining vegetation barriers at crop boundaries.
- Undertake educational campaigns with the active participation of hunting organizations and clubs, and continue and promote research and monitoring, especially in the eastern Mediterranean countries and Portugal (Tucker and Heath 1994).

Black Kite (Milvus migrans)

The European population is estimated at 186,000 - 254,000 pairs (372,000 - 507,000 mature individuals), while the EU28 population is estimated at 51,300 - 63,500 pairs (102,000 - 127,000 mature individuals) according to the IUCN Red List. The Greek population is estimated at 20-40 pairs, representing <1% of the European population (BirdLife International 2021).

The species is protected by Directive 2009/147/EK (Annex I) and the Bern (Annex II) and Bonn (Annex II) Conventions. According to the Greek Red Data Book, the species is classified in Greece as Critically Endangered (CR), while at the European level it is listed as Least Concern (LC) by the IUCN (BirdLife International 2021). It is also classified by BirdLife International as a SPEC 3 species of European interest in terms of conservation (BirdLife International 2017) and is also protected by the CITES International Convention (Appendix II).

Although the species was never a common species in Greece, it used to have a wide distribution and a larger population. In the last 3 - 4 decades its population has declined significantly in Greece. It nests in only a few sites in Thrace, Macedonia, western Thessaly and in Epirus. In the large wetlands of northern and western Greece it is also observed as a winter visitor, and in Crete where several individuals winter in the plain of Messara and the Asterousia Mountains in the prefecture of Heraklion (Handrinos and Akriotis 1997). Three individuals ringed in Germany were found in Laconia, Kythera and Pyrgos Ilia (Akriotis and Chandrinos 2004).

The species is found in a wide range of habitats such as dry and open areas, fragmented forest areas, lakes, and rivers adjacent to sparsely wooded forests. It is found at altitudes of up to 1000 meters. In Europe, unlike elsewhere, it avoids breeding in urban areas (Hagemeijer and Blair 1997). The species is migratory with a wide geographical distribution. It arrives at breeding sites between February and May (Ferguson-Lees and Christie 2001). Eggs are laid between March and June. It ranges from sub-Saharan Africa to southern Africa (Orta et al. 2020). It nests in trees forming small colonies

(2 to 30 pairs) and on rocks (Sergio and Boto 1999). It builds its nest in forks of trees, pine, or oak. It uses the same nest for several years or several times builds a new nest close to the old one in the same tree. It feeds on insects, birds, lizards, snakes, rodents, amphibians, dead fish, and sometimes animal carcasses (Sergio and Boto 1999). Also, human waste has become a food source in many areas. It seeks its food by flying close to the ground surface.

According to the list of threats to species of conservation concern (Dimalexis 2009), the reported threats to the species are as follows:

- Intensive and confined livestock farming
- Illegal use of poisoned bait to control 'nuisance' mammals
- Changes in the frequency and intensity of forest fires (increase or decrease)
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming
- Pollution from agrochemicals discharged into water bodies, waterlogging of receptors.

The threats listed on the IUCN red list are poisoning, poaching and water pollution from pesticides and other chemicals (Orta et. al. 2020). Poisoning and water pollution continue to cause declines in the species' populations in Europe. Although it has adapted to the presence of humans and inhabits habitats close to urban areas, particularly as far as its diet is concerned, urban modernization has been accepted as reducing its available foraging habitat (Ferguson-Lees and Christie 2001). Finally, the species is highly vulnerable to the effects of potential wind energy development (Strix 2012).

The proposed conservation actions, according to the IUCN, are as follows:

- Develop and implement stronger legislation against poisoning, poaching and pollution.
- Appropriate assessments of the impacts of wind energy development.

Levant Sparrowhawk (Accipiter brevipes)

The European population of the species is estimated at 3.800 - 7.700 pairs (7.700 - 15.300 mature individuals), while in the EU28, according to the IUCN red list, the population is estimated at 1.700 - 3.400 pairs (3.400 - 6.800 mature individuals). The population of the species at the European level is considered stable. The Greek population of the species is estimated at 1,000 - 2,000 pairs and constitutes 23 % of the European population (BirdLife International 2021).

The species is protected by Directive 2009/147/EK (Annex I) and the Bern (Annex II) and Bonn (Annex II) Conventions. It is not assessed in the Greek Red Data Book and is therefore listed non evaluated (NE), while it is listed as least concern (LC) at European level by IUCN (BirdLife International 2021). It is also classified by BirdLife International as a SPEC 2 species of European interest in terms of conservation (BirdLife International 2017) and is also protected by the CITES International Convention (Appendix II).

The species is found in northern Greece (Macedonia and Thrace), although breeding has been recorded in central Greece, the Peloponnese, and some islands (Kefalonia, Lesvos, Samos) (Handrinos and Akriotis 1997).

According to Poirazidi (2017), the number of territories of the species in the Dadia - Lefkimi - Soufli National Park in 2012 was 3.5.

The species breeds in fragmented deciduous forests along river and stream basins but can also use broadleaf forests in the foothills and slopes of mountains, usually below 1,000 m, but has been recorded up to 2,000 m (Hagemeijer and Blair 1997). It arrives at its breeding site in April or early May and lays its eggs in May or early June. Breeds in the Balkans, Caucasus, southern Russia, and central Asia. It nests on tree branches, preferring deciduous trees. The nest is a tiny stick platform (30 cm wide, 15 cm deep) lined with twigs and sometimes leaves, usually 5-10 m above the ground. Occasionally it will use the old nests of other birds. Lays 3-5 eggs. It feeds on lizards, newborn birds, and large insects such as dragonflies and grasshoppers (Tucker and Heath 1994). The species is a migrant, wintering in sub-Saharan Africa (Ferguson-Lees and Christie 2001; Orta and Marks 2014). The birds leave their breeding grounds in September. During migration it often flies at night and travels in flocks that become particularly large at certain bottlenecks (Orta and Marks 2014).

According to the recorded threats in the Threats to Species of Concern List (Dimalexis 2009) (species of interest), the reported threats to the species are:

- Expansion - intensification of annual crops
- Residential development, urban or extra-urban, legal, or arbitrary
- Recreational tourism infrastructure (ski resorts, golf courses, camps)
- Improper forest management
- Disturbing activities (hunting, logging, fishing, collecting plants and firewood)
- Harmful recreational activities

- Deforestation Logging
- Changes in the frequency and intensity of forest fires (increase or decrease)
- Construction of dams and flood control structures, irrigation networks
- Drainage of wetlands and other land reclamation activities
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming
- Pollution from agrochemicals discharged into receiving waters, waterlogging of receiving waters.
- Changes in habitat extent and distribution due to climate change

Threats listed on the IUCN red list are the effects of potential wind energy development, as the species is highly vulnerable to these (Strix 2012). The species is also considered undesirable to falconers in Georgia and large populations are killed after being captured in an attempt to catch other more desirable falcon species (Orta and Marks 2014).

The recommended conservation actions, according to the IUCN, are as follows:

- Identification and protection of key areas for the species, particularly from wind farm development.
- Awareness campaign to reduce poaching.
- Conducting studies on the ecology of the species and monitoring populations to inform conservation measures.

Marsh Harrier *(Circus aeruginosus)*

The species in northern Europe is migratory. Southern populations are partially migratory or simply move to neighboring areas. Several individuals are resident in Greece, while it is also generally endemic in Western Europe (Ferguson-Lees and Christie 2001, Orta et al. 2020).

The European population of the species is estimated at 151,000 - 243,000 breeding females (303,000 - 485,000 mature individuals), while in the EU28, according to the IUCN Red List, the population is estimated at 53,200 - 88,000 breeding females (106,000 - 176,000 mature individuals). The Greek population is estimated at 50-100 pairs, less than 1% of the European population (BirdLife International 2021).

The species is protected by Directive 2009/147/EC (Appendix I) and the Bern (Appendix II) and Bonn (Appendix II) Conventions and is classified in Greece as a vulnerable species (VU) by the Greek Red Data Book, while it is listed at European level as a species of least concern (LC) by the IUCN (BirdLife International 2021). It is also not classified by BirdLife International as a species of European interest in terms of conservation (BirdLife International 2017), while it is also protected by the international CITES convention (Appendix II).

According to Poirazidi (2017), the number of territories of the species in the Dadia - Lefkimi - Soufli National Park in 2012 was 3.

The species nests in the large wetlands of Macedonia and Thrace and in the Gulf of Amvrakikos in western Greece. It is common during migration throughout the mainland, many Aegean islands and Crete (Handinos and Akriotis 1997). Migratory birds leave their breeding grounds in September and October and winter from southern France south to sub-Saharan Africa (Orta et al. 2020). They begin their return journey in February and March, arriving in March and April (Snow and Perrins 1998; Ferguson-Lees and Christie 2001; Orta et al. 2020). Migration is broad-based, although there is some concentration at a few sites (Brown et al. 1982). Hundreds of birds are occasionally found at roosts, sometimes with other cicadas such as Circus pygargus, but they are usually solitary and only temporarily grouped at particularly rich feeding sites (Snow and Perrins 1998, Ferguson-Lees and Christie 2001, Orta et al. 2020). Birds fly approximately 10-30 m above the ground (Brown et al. 1982).

The species inhabits extensive areas of dense vegetation in fresh or brackish water, in lowland areas (Orta et al. 2020), up to an altitude of 400 m (Hagemeijer and Blair 1997). Its diet consists of small birds, but it supplements its diet with mammals such as rabbits and rats, as well as amphibians and fish.

The species nests on the ground, preferring extensive reed beds (Cramp and Simmons 1980; Ferguson-Lee and Christie 2001). The nest is a reed pile built in dense vegetation. Three to six eggs are usually laid (Orta et al. 2020).

According to the threats listed in the Threats to Species of Concern (Dimalexis 2009) (species of interest), the reported threats to the species are:

- Illegal use of poisoned baits to control "harmful" mammals

- Lead poisoning by buckshot.
- Changes in the frequency and intensity of forest fires (increase or decrease)
- Wetland drainage and other land reclamation projects
- Dredging, stream bed clearing, embankments of the shoreline and stream beds and the aggradation of soils, streams.
- Soil, stream, and coast aggradation

Threats listed on the IUCN red list include drainage of wetlands, poaching, and overuse of pesticides in and around wetlands (Ferguson-Lees and Christie 2001, Orta et al. 2020). The species is also highly vulnerable to the impacts of potential wind energy development (Strix 2012).

The proposed conservation actions, according to the IUCN, are as follows:

- Conserve the species' wetland habitats through legal protection and restoration of already degraded wetlands.
- Avoid disturbance around nesting sites during agricultural activities until the offsprings are feathered.

Hen Harrier (Circus cyaneus)

The species breeds from Ireland to European Russia (Orta et al. 2014), while it does not breed in the Balkans, Italy, Switzerland, and Austria (Hagemeijer and Blair 1997). In Greece, the Hen Harrier does not nest and is only a winter visitor. A substantial number of individuals pass through Greece during the migration, following a route from the Aegean Sea, the southern Peloponnese, the Ionian Sea and heading towards southern Italy. From there they continue their journey to the countries where they give birth.

European population is estimated at 56,300 - 86,600 breeding females (112,000 - 174,000 mature individuals), while in the EU28, according to the IUCN Red List, the population is estimated at 10,500 - 15,200 pairs (21,100 - 30,300 mature individuals) (BirdLife International 2021).

The species is protected by Directive 2009/147/EK (Annex I) and the Bern (Annex II) and Bonn (Annex II) Conventions. According to the Greek Red Data Book, the species is not assessed as Non-Evaluated (NE) in Greece, while according to IUCN it is listed as Least Concern (LC) at European level (BirdLife International 2021). It is also classified by BirdLife International as a SPEC

3 species of European interest for conservation (BirdLife International 2017) and is protected by the CITES Convention (Appendix II).

The species has been observed throughout the mainland and islands (Handrinos and Akriotis 1997).

The habitat of the species is swamps with low vegetation, grasslands, and open areas. It is also found in fringing ecosystems, even at high altitudes, in large open wet areas including peat bogs, riparian woodlands, wet meadows, brackish marshes, dry uplands including upland meadows and areas adjacent to coniferous forests. In Greece, hen harriers are observed in a variety of habitats during migration (e.g., high mountains, rocky gorges) and in winter they descend to flat, open areas such as farmland and meadows, preferably near wetlands (Handrinos and Akriotis 1997). It is a finicky wetland predator, 43-51 cm long, with a long tail and slightly curved wings. The male has beautiful pale grey plumage with black 'noses' on the wings. The male's coloring and smooth flight give this predator the appearance of a seagull from a distance. It holds its wings above the horizontal in an open V and glides through the air, low and light. Females and juveniles are deep brown on top with many yellowish bars on the underside and a distinctive white patch at the base of the tail. Spawning begins in mid-April and lasts until early July but varies according to the latitude of the species' distribution. It nests on the ground, in dense grass or shrubbery, in crops or in marsh vegetation. Its diet consists mainly of small mammals such as mice and squirrels, but it also preys on small birds in open habitats, particularly those of the Passeridae family. Birds are often the main prey during the breeding season. It also feeds on reptiles and insects (Cramp and Simmons 1980; Ferguson-Lee and Christie 2001; Leckie et al. 2008; Arroyo et al. 2009).

According to the threats recorded in the Threats to Species of Concern List (Dimalexis 2009) (species of interest), the reported threats to the species are:

- Wetland drainage and other land reclamation works.
- Erosion control works, streambed cleaning, embankment of lakeshore and streambeds.
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming
- Pollution from agrochemicals discharged into receiving waters, waterlogging of receptors.

The threats listed in the IUCN red list are habitat destruction and shrinkage due to intensive agriculture, drainage of marshes, swamps, and deforestation. The species is also threatened by poaching in Central and Eastern Europe (Tucker and Heath 1994).

The recommended conservation actions, according to the IUCN, are as follows:

- Conservation of large open areas such as steppes, wet grasslands, and low grazing intensity grasslands.
- Afforestation of riparian and upland shrublands should be prohibited in areas where these habitats are threatened.
- Prohibition of poaching.

Montagu's Harrier (Circus pygargus)

The species is fully migratory and is found, in its wide distribution range, only as a summer breeding visitor, wintering and migratory.

The European population of the species is estimated at 69,700 - 110,000 breeding females (139,000 - 219,000 mature individuals), while in the EU28, according to the IUCN red list, the population is estimated at 14,300 - 20,200 breeding females (28,600 - 40,400 mature individuals). The Greek population of the species is estimated to have 5-10 pairs, less than 1% of the European population (BirdLife International 2021).

The species is protected by Directive 2009/147/EK (Annex I) and the Bern (Annex II) and Bonn (Annex II) Conventions. According to the Greek Red Data Book in Greece the species is classified as Critically Endangered (CR), while according to the IUCN at European level it is listed as a species of reduced concern (LC) (BirdLife International 2021). It is also not classified as a species of European interest in terms of protection by Birdlife International (BirdLife International 2017), while it is also protected by the CITES International Convention (Appendix II).

European populations of the species spend the winter in sub-Saharan Africa (Ferguson-Lees and Christie 2001, Orta et al. 2020). It leaves its breeding grounds in August and September and returns in March and April (Snow and Perrins 1998, Orta et al. 2020). In Greece, the species is found in western Macedonia in the Florina area and perhaps in the northern part of Evros in Thrace, but is more common during migration (Chandrinos 1992, Handrinos and Akriotis 1997).The Montagu's

Harrier tends to hunt alone, although it has been observed to form groups (often over 50 individuals) with Circus macrourus and Circus aeruginosus when prey concentrations are high (Ferguson-Lees and Christie 2001). The species prefers open habitats, usually in lowland areas. It nests on tall vegetation, in cereal fields, but there is evidence that it can also nest in alpine meadows. It lays 3-5 eggs. The diet consists of mammals and small birds, reptiles, and large insects.

According to the threats recorded in Threats to Species of Interest (Dimaleksis 2009), the reported threats to the species are as follows:

- Expansion - intensification of annual crops
- Illegal use of poisoned bait to control 'pest' mammals
- Abandonment of traditional farming practices and land use, including abandonment of extensive agriculture and livestock farming
- Pollution from agrochemical run-off into water bodies, waterlogging of receptors.

Threats listed in the IUCN Red List include conversion of habitat to agricultural land, as the use of harvesters to harvest crops often results in failure to reproduce (Orta et al. 2020, Ferguson-Lees and Christie 2001). Intensification and changes in agricultural practices could potentially deplete food reserves for the species. (Ferguson-Lees and Christie 2001, Orta et al. 2020). The use of powerful pesticides also appears to have caused declines in European populations in the past (Ferguson-Lees and Christie 2001). The species is also highly vulnerable to the effects of potential wind energy development (Strix 2012).

Suggested conservation measures, according to the IUCN, are as follows:

- Maintain tall vegetation during the breeding season, as mortality rates of offsprings are high during agricultural activities.
- Key management actions include moving nests to safer areas during agricultural harvesting, and no agricultural work should be carried out around nesting sites.
- Research on migration corridors and the location of stopover and wintering areas of the species would lead to better development of conservation measures (Trierweiler 2010).

Pallid Harrier (Circus macrourus)

The European population of the species is estimated at 1,000-2,200 breeding females (2,000-4,300 mature individuals), while the EU28 population is estimated at 10-50 breeding females (20-100 mature individuals) (BirdLife International 2021).

The species is protected under Directive 2009/147/EC (Annex I) and the Bern (Annex II) and Bonn (Annex II) Conventions. According to the Greek Red Data Book, there are insufficient data to assess its threatened status (DD) in Greece, while according to IUCN it is listed as a species of least concern (LC) at the European level (BirdLife International 2021).It is also classified by Birdlife International as a SPEC 1 species of European interest for conservation (BirdLife International 2017) and is also protected by the International CITES Convention (Appendix II).

The species is a transient visitor to Greece and has been observed throughout the Greek mainland and islands (Handrinos and Akriotis 1997).

The species breeds in uncultivated grasslands and avoids very dry open areas, choosing wetter areas with sparse shrubs and scattered trees for nesting (Tucher and Heath 1994). It nests at altitudes above 1,000 m in its breeding range (Hagemeijer and Blair 1997). The species is migratory, with most birds wintering in sub-Saharan Africa or Southeast Asia. The species leaves the breeding grounds between August and November and returns in March-April to nest in small colonies. The nest is made of grass and is built on the ground, protected by tall vegetation. It lays 3-6 eggs (usually 4 or 5). The diet consists of small birds and rodents, but also lizards caught in flight and on the ground (Tucker and Heath 1994). Although the species is usually found alone, females and juveniles form groups of 10-15 individuals during migration (Snow and Perrins 1998; Ferguson-Lees and Christie 2001).

The reported threats to the species are as listed in the List of Threats to Species of Concern (Dimalexis 2009) (species of interest):

- Illegal use of poisoned bait to control 'nuisance' mammals
- Drainage of wetlands and other land reclamation projects
- Erosion control works, streambed cleaning, lakeshore, and streambed embankments.
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming

- Pollution from agrochemicals discharged into receiving waters, waterlogging of receiving waters.

The main threats listed in the IUCN Red List are the degradation and destruction of steppe grasslands through conversion to cropland, burning of grassland (by farmers or storms), intensive grazing of wet pastures, and clearing of shrubs and herbaceous vegetation (Galushin et al. 2003).

The IUCN recommends the following conservation measures:

- Conserve wetlands.
- Support moderate grazing and grassland conservation.
- Develop survey methodology (including Geographic Information Systems-GIS) and conduct surveys, especially in breeding areas and in the northern and southern parts of the species' range. Search for new nesting sites. Conduct research on the size of the species' foraging range and its role in population movements.
- Introduce and enforce legislation to support agricultural recovery in breeding areas.
- Promote full legal protection and education in countries that are migratory corridors for the species.

European Honey Buzzard (Pernis apivorus)

The European population of the species is estimated at 120,000 - 175,000 pairs (241,000 - 350,000 mature individuals), while in the EU28 the population is estimated at 44,000 - 71,100 pairs (95,600 - 151,000 mature pairs). The Greek population is estimated to number 1,000 - 2,000 pairs (BirdLife International 2021), corresponding to 1% of the European population.

The species is protected by Directive 2009/147/EC (Annex I) and the Bern (Annex II) and Bonn (Annex II) Conventions. According to the Greek Red Data Book in Greece and the IUCN at European level, the species is classified as Least Threatened (LC) (BirdLife International 2021). It is also not classified as a species of European interest in terms of protection by Birdlife International (BirdLife International 2017), and it is also protected by the CITES International Convention (Appendix II).

The species has a wide distribution in Greece although the main population is found in northern Greece (Macedonia, Thrace). It is also quite common during migration where large groups of 20-50 individuals are often observed on the eastern Aegean islands and Crete (Handrinos and Akriotis 1997, Agostini et al. 2007).

According to Poirazidi (2017), the number of the species' territories in the National Park of Dadia - Lefkimi - Soufli in the year 2012 was 15.5.

The species is migratory and winters in tropical Africa. It leaves the breeding grounds in August and September and returns between April and June (Orta et al. 2020). Birds are mostly solitary except during migration when they flock and concentrate in large numbers at preferred crossing points (Ferguson-Lees and Christie 2001; Orta et al. 2020). It is found in forests, preferably deciduous but also mixed, in temperate and northern zones up to 1,500 m above sea level. It also uses a variety of forested and open habitats, including soil and cultivated land. It feeds primarily on wasps and secondarily on rodents, small birds, and eggs. Nests are built on branches, preferably in deciduous trees. It usually lays two eggs (Orta et al. 2020).

According to the threats recorded in the list of threats to the species of conservation concern (Dimalexis 2009), the reported threats to the species are:

- Inappropriate forest management,
- Nuisance recreational activities,
- Other nuisance activities (military exercises, scientific research, vandalism),
- Deforestation logging,
- Changes in the frequency and intensity of forest fires (increase or decrease),
- Abandonment of traditional agricultural practices and land use (including abandonment of extensive agriculture and livestock farming)
- Pollution from agrochemical run-off into water bodies (waterlogging of water bodies)

Threats listed on the IUCN Red List include poaching during migration, particularly in Italy, Malta, and Lebanon (Ferguson-Lees and Christie 2001, Orta et al. 2020). Population decline in northern Europe is due to deforestation and inappropriate forest management. Human habitat disturbance is also a threat to the species. Pesticide use has not had a significant impact in Europe (due to their habits: they live in forests and feed on wasps). It is also highly vulnerable to the effects of potential wind energy development (Strix 2012).

Suggested conservation actions, according to the IUCN, are as follows:

- Prevent poaching.
- Encourage low-intensity agriculture and forestry.
- Minimize disturbance during the breeding season.

Lesser Kestrel (Falco naumanni)

The species is migratory and breeds in Europe in Spain, Italy, and Greece. Smaller populations are also found in Russia, Azerbaijan, Turkey, and Portugal.

The European population of the species is estimated at 32,900 - 42,600 pairs (65,900 - 85,200 mature individuals), while in the EU28, according to the IUCN Red List, the population is estimated at 29,000 - 32,500 pairs (58,000 - 65,000 mature individuals). The Greek population is estimated at around 7,100 pairs, representing 19% of the European population (BirdLife International 2021). The population trend is downward at both European and EU28 level.

The species is protected under Directive 2009/147/EK (Annex I) and the Bern (Annex II) and Bonn (Annexes I and II) Conventions. According to the Greek Red Data Book, the species is classified in Greece as Vulnerable (VU), while at European level it is listed by the IUCN as Least Concern (LC) (BirdLife International 2021). It is also classified by BirdLife International as a SPEC 3 species of European interest in terms of conservation (BirdLife International 2017) and is also protected by the International Convention on Trade in Endangered Species of Wild Fauna and Flora (CITES Appendix II).

The species is found mainly in Central and Western Greece (Epirus, Thessaly, Central Greece), usually in villages near large lowland areas (Handrinos and Akriotis 1997). A much more common species and with a wider distribution in the past, up to the early 1960s, while afterwards it suffered a dramatic decrease and shrinking of its distribution (Handrinos and Akriotis 1997). In Greece there are at least 140 colonies, with the most important population occurring in the Thessalian plain (Legakis and Marangou 2009). There is one rediscovery of the species in Greece (one individual) that was ringed in Austria (Akriotis and Chandrinos 2004).

The species is usually found in colonies, often close to human settlements, on steppes, natural and managed grasslands, open bushland (toasty grasslands), low hills with little vegetation and non-intensive crops. The birds leave their breeding grounds in September and return between February and April (Orta and Kirwan 2020). They migrate in flocks of diverse sizes, usually tens to low hundreds, often with other hawks such as F. tinnunculus, F. vespertinus and F. amurensis (Ferguson-Lees and Christie 2001). They cross water bodies by flying high enough to be barely detectable, while over land they fly low (about 20-30 m), particularly during the northward migration (Brown et al. 1982; Ferguson-Lees and Christie 2001).

It breeds colonially (usually 15-25 pairs) and nests mainly in May, mainly in human structures such as large old buildings, walls, and ruins, in villages and rubble in rural areas, in cracks or under roofs, but also using natural areas such as rock cavities, quarries and occasionally old nests. It also uses artificial boxes for nesting and occasionally nests on the ground (Vlachos et al. 2004b). The foraging habitat of the species consists of open areas with low vegetation and bare ground, as well as grassland, and it hunts almost exclusively in rural areas with dry insect crops. Its diet consists almost exclusively of insects caught in the air and on the ground, and it rarely feeds on lizards and small rodents (Vlachos et al. 2003). The species winters in sub-Saharan Africa.

According to the Greek Red Data Book (Legakis and Marangou 2009), the threats to the species are the possible loss of habitat in the wintering areas in Africa and during the migration period. In Greece, the main problems faced by the species are the intensification of agriculture, which reduces foraging areas (grasslands, fallow land, uncultivated areas between fields); the reduction of non-irrigated crops, such as cereals, due to the development of irrigated crops, resulting in the reduction of orthopterans and other insects and invertebrates, which are the main food source of the species; and the reduction of grasslands close to settlements by converting them to crops or afforestation. Intensive use of pesticides also reduces food availability and may cause poisoning problems for the birds themselves (Sfougaris et al. 2004). A limiting factor for the species is the reduction of available nesting sites in human settlements. This reduction is due to the destruction of old buildings (houses, shelters, storehouses, dovecots, etc.) or their repair with new materials. Finally, in some areas there is harassment and persecution by humans, but in general the Lesser Kestrel is accepted in villages.

According to the list of threats to species of conservation concern (Dimalexis 2009), the reported threats to the species are as follows.

- Expansion - intensification of annual crops,
- Residential development, urban or unplanned, legal, or unauthorized,
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock,
- Pollution from agrochemicals discharged into receiving waters, waterlogging of receiving waters.

IUCN Red List threats include habitat degradation and loss, mainly because of agricultural intensification, but also deforestation and urbanization. The use of pesticides can cause direct mortality, as well as indirect mortality through the reduction of its prey. Renovation of old buildings has led to the loss of nesting sites (Davygora 1998).

Suggested conservation actions, according to the IUCN, are as follows:

- Monitor the species and encourage research into limiting factors and appropriate habitat management.
- Promotion of appropriate agricultural policies (extensive farming), control of pesticide use, construction of artificial nesting sites.
- Protection of colonies.

Peregrine Falcon (Falco peregrinus)

The European population of the species is estimated at 14,900-28,800 pairs (32,200-62,100 mature individuals), while the EU28 population is estimated at 16,100-31,100 (32,200-62,200 mature individuals). The Greek population is estimated at 300-500 pairs, representing 2% of the European population (BirdLife International 2021).

The species is protected under Directive 2009/147/EK (Annex I) and the Bern (Annex II) and Bonn (Annex II) Conventions. According to the Greek Red Data Book in Greece and the IUCN at European level, the species is classified as Least Threatened (LC) (BirdLife International 2021). It is also not included in any of BirdLife International's categories of species of European interest for conservation (BirdLife International 2017) and is also protected by the international CITES convention (Appendix I).

The species has a wide distribution and is found throughout Greece, although its population density depends on the availability of suitable nesting habitat (Handrinos and Akriotis 1997).

According to Poirazidi (2017), the number of territories of the species in the National Park of Dadia - Lefkimi - Soufli in 2012 was 2.

In central and northern Europe, the species migrate and spend the winter in Africa. In Greece it is a resident species. It is solitary and spends most of its time resting on rocks or trees. It lives in open areas with woody growth or high cliffs and rarely in sparse forests. It also nests on steep cliffs, in buildings, in trees and rarely uses the nests of other birds. The endemic area ranges from 51 km^2 in northern Europe to 160 km^2 in southern Europe. Migratory birds leave their breeding grounds between August and November and return between March and May (Snow and Perrins 1998). Most birds migrate individually or in pairs. It is found in a wide variety of habitats including the Mediterranean islands, the Aegean islands, the Adriatic, and the islands of Spain. In Greece, it is found on Crete and other islands and rocky shores on the mainland. The species feeds on small and medium-sized birds (mainly pigeons). It usually eats part of its prey and leaves the rest. It always catches its prey in the air, usually by circling above it at high altitude and swooping down vertically at speeds of up to 240-410 km/h. Nesting occurs from February to March in temperate zones and eggs are usually laid in a crevice in a rock without building a nest (White et al. 2013). It is a monogamous species.

According to the threats recorded in the list of threats to the species of conservation concern (Dimalexis 2009), the reported threats to the species are:

- Expansion - intensification of annual crops
- Intensification of perennial crops (vineyards, orchards, olive groves, etc.)
- Residential development, urban or non-urban, legal, or unauthorized
- Recreational tourism infrastructure (ski resorts, golf courses, campsites)
- Extractive activities: quarries-mining
- Persecution by specific users as harmful
- Nuisance activities (hunting, logging, fishing, plant, and firewood collection
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming

- Pollution from agrochemicals discharged into receiving waters, waterlogging of receiving waters.
- Changes in habitat extent and distribution due to climate change

Threats listed in the IUCN Red List are Persecution throughout the range was the major threat in the 19th and early 20th centuries (Snow and Perrins 1998). Severe population declines in the 1960s-1970s were due to eggshell breakage and adult and fledgling mortality from hydrocarbon contamination associated with pesticides of the time (Ferguson-Lees and Christie 2001; White et al. 2013). The species is used extensively by falconers who raise them for hunting, although the population-level impact of this is uncertain (White et al. 2013).

Suggested conservation actions, according to the IUCN, include:

- Ban the use of highly toxic pesticides and discourage the use of new, potentially harmful chemicals.
- Protect and monitor nesting sites and prevent exposure of the species to toxic contaminants through their diet (Tucker and Heath 1994).

Eleonora's Falcon (*Falco eleonorae*)

The European population of the species is estimated at 14,200-14,500 pairs (28,400-28,900 mature individuals), while the EU28 population is estimated at 14,100-14,400 pairs (28,300-28,800 mature individuals). The Greek population of the species is estimated at 12,300 pairs, representing 86% of the European population (BirdLife International 2021).

The species is protected under Directive 2009/147/EK (Annex I) and the Bern (Annex II) and Bonn (Annex II) Conventions. According to the Greek Red Data Book in Greece and the IUCN at European level, the species is classified as Least Concern (LC) (BirdLife International 2021). It is also not classified by BirdLife International as a species of European conservation interest and is protected by the CITES Convention (Appendix II).

In Europe, the species breeds mainly in Greece (86% of the European population), but also in Spain (6% of the European population) and Italy (5% of the European population).

The species is distributed throughout the Aegean Sea with six major concentrations in the northern Aegean, Sporades, eastern Cyclades, Antikythera, southwestern Dodecanese and the islets of eastern Crete (Handrinos and Akriotis 1997).

The species is fully migratory, leaving its Mediterranean breeding grounds in October and November. It spends the winter in Madagascar, East Africa, and the Mascarene Islands, returning to its breeding grounds in late April and May. It lives on rocky islands, steep coastlines, and cliffs where it breeds in colonies of 5 to 20 pairs or up to 200 pairs. The species is known to fly at altitudes of up to 1,000 m during the breeding season (Snow and Perrins 1998). The species tends to move in small and loose flocks and on migratory journeys with other species that fly at high altitudes, including Falco subbuteo (Snow and Perrins 1998; Ferguson-Lees and Christie 2001). It feeds mainly on small birds and insects caught in the air. During the summer, its diet consists mainly of large insects caught in the air, and during the breeding season its diet changes drastically, feeding almost exclusively on small migratory passeriformes on their way to Africa. This foraging strategy, combined with the species' late reproduction, ensures a protein-rich diet for the offspring, whose development coincides with the autumn migration. The species nests in crevices and cavities in rocks or holes, but also on the ground. It is a monogamous species. It lays 2 - 3 eggs (range 1 - 7) in summer (July - August). The hatching of the offsprings coincides with the autumn migration of birds. Both sexes feed them, but mainly the male.

According to the threats recorded in the list of threats to the species of conservation concern (Dimalexis 2009) (species of interest), the reported threats to the species are:

- Intensification of perennial crops (vineyards, orchards, olive groves, etc.)
- Tourism - recreation infrastructure (ski resorts, golf courses, camps)
- Hunting - poaching - trapping - collecting eggs or offsprings - destroying nests.
- Disturbing activities (hunting, logging, fishing, gathering, plants, and firewood)
- Introduction of invasive species
- Pollution from agrochemicals discharged into receiving waters, waterlogging of receptors.
- Changes in habitat extent and distribution due to climate change

The threats listed on the IUCN red list are historically persecution by humans. Also, human disturbances associated with tourism development have been shown to negatively affect reproductive success. Predation by rats is also significant on some islands that are breeding sites. Finally, the species is vulnerable to the effects of potential wind energy development (Strix 2012).

The proposed conservation actions, according to the IUCN, are as follows:

- Implement effective actions to protect coastal areas and carry out Environmental Impact Assessments (EIAs) related to developments and activities in these areas. National and international policies on coastal tourism should discourage the development of new large-scale resorts and favor sustainable tourism that is more environmentally friendly.
- Protection of colonies
- Investigate the ecological requirements and threats to wintering areas and protect them.
- Increase public awareness of the species (Barov and Derhe 2010).

Red footed Falcon (Falco vespertinus)

The species breeds in Eastern Europe, with the main part of its range extending from Belarus and south into Hungary, northern Serbia and Montenegro, Romania, Moldova, and eastern Bulgaria, and east into Ukraine and north-western and southern Russia. The species spends the winter in southern Africa (Palatitz et al. 2009; Billerman et al. 2020).

The species is protected under Directive 2009/147/EK (Annex I) and the Bern (Annex II) and Bonn (Annex I and II) Conventions. According to the Greek Red Data Book, there are insufficient data in Greece to assess its threatened status (DD), while at the European level it is classified as Vulnerable (VU) by the IUCN (BirdLife International 2021). It is also classified by Birdlife International as a SPEC 1 species of European interest for conservation (BirdLife International 2017) and is protected by the CITES Convention (Appendix II).

The European breeding population of the species is estimated at 57,000 - 84,000 pairs (115,000 - 170,000 mature individuals), while in the EU28 it is estimated at 2,500 - 4,000 pairs (5,000 - 8,000 mature individuals) (BirdLife International 2021).

The species inhabits open areas with sparse tree cover and forest edges, agricultural land, pastures and meadows with scattered trees and hedgerows. It is found from sea level to 300 meters above sea level. It nests in colonies in old raven nests and sometimes between active rook nests. It prefers to build its nest in the upper part of the canopy, but sometimes nests in cliffs or tree holes, in hedgerows or in isolated bushes (Ferguson-Lees and Christie 2001, Billerman et al. 2020). The breeding season lasts from mid-April to August (Billerman et al. 2020). It lays 4-5 eggs. The laying rate is one egg every two days. Incubation lasts 22-23 days and is performed by both sexes. Offsprings leave the nest at 27-30 days of age. It feeds mainly on insects caught in the air (especially orthopterans, but also beetles, dragonflies, butterflies, and cicadas). During the breeding season the offspring may feed on small birds, rodents, lizards, and frogs (in Hungary mice and toads are an important part of the diet). As mentioned above, the species is migratory, leaving its breeding grounds in August and September and returning between February and May. During migration they form mixed flocks, often over 100 individuals, with other hawks such as F. naumanni, and tend to stay at very high altitudes for most of the journey (Ferguson-Lees and Christie 2001).

The reported threats to the species, according to the list of threats to species of conservation concern (Dimalexis 2009), are as follows:

- Expansion - Intensification of perennial crops
- Hunting - poaching - trapping - egg or chick collection - nest destruction
- Abandonment of traditional agricultural practices and land use, including abandonment of extensive agriculture and livestock farming
- Pollution from agrochemicals discharged into receiving waters, waterlogging of receiving waters.

Threats listed on the IUCN Red List include the destruction of suitable nesting sites through deforestation for agricultural expansion or the timber trade (Ferguson-Lees et al. 2001) and the widespread use of pesticides, which affects the species' food supply (Ferguson-Lees et al. 2001). In central Europe, agricultural intensification is causing habitat loss for the species and the reduction of extensive pasture management, particularly grazing, is affecting the species' food supply (Palatitz et al. 2009). Between 1980 and 1999, intensive poisoning of Corvus frugilegus in Hungary forced the species to change its nest site selection habits, resulting in the near extinction of large colonies of the species in that country, with only 38% of the breeding population now breeding colonially (Palatitz et al. 2009). Poaching, poisoning, and electrocution on power lines have also been reported as threats in some countries. In October 2007, 52 roosting birds were found shot in Fassouri, Cyprus, with 46 already dead and 6 injured (Palatitz et al. 2009).

Suggested conservation actions, according to the IUCN, are as follows:

- Continue to conduct regular surveys to monitor population trends of the species,
- Conduct further research on the effects of changes in agriculture and land management in general.
- Changing agricultural and land use practices in Central Europe through EU and national policies.
- Provide artificial colonies for the species.
- Prevent hunting in sensitive areas through law enforcement campaigns, prosecution of trespassers and public awareness programs.

Merlin (Falco columbarius)

The species is migratory, with the European population estimated at 20,000-41,700 pairs (40,100-83,400 adults) and the EU28 population estimated at 6,700-14,400 pairs (13,400-28,700 adults) (BirdLife International 2021). In Europe, the species breeds mainly in Russia (where it accounts for 48% of the European population), but also has a significant presence in Finland, Sweden, Norway, Iceland, and the UK. According to the IUCN Red List, the population trend in Europe is estimated to have declined in recent years, with the decline being much more pronounced in the EU28.

In Greece, the species is a winter visitor, occurring mainly in northern Greece during the wintering and migration periods (Handrinos and Akriotis 1997).

The species is protected by Directive 2009/147/EK (Annex I) and by the Bern (Annex II) and Bonn (Annex II) Conventions. In Greece, the species has not been assessed according to the Greek Red Data Book and is therefore classified as not evaluated (NE), while the IUCN classifies the species at European level as vulnerable (VU) (BirdLife International 2021). It is also not listed by BirdLife International as a species of European conservation interest and is protected by the CITES Convention (Appendix II).

The species occurs in a wide range of habitats, from sea level to forest margins in some areas, in scrubby steppes, northern tundra, swamps and open grasslands. It generally prefers open areas with scattered trees or scrubby vegetation. It is often found along the coast during the migration period. The species breeds from March to June, using mainly old nests of other species (especially rookeries), but also tree holes, overhangs on rocky cliffs. It usually lays between three and six eggs. Its diet consists mainly of small birds, bats, insects, and small rodents.

According to the threats recorded in the list of threats to the species of conservation concern (Dimalexis 2009), the reported threats to the species are:

- Expansion - intensification of perennial crops
- Residential development, urban or extra-urban, legal, or unauthorized
- Wetland drainage and other land reclamation projects
- Erosion control works, cleaning of stream beds, embankments of seashore and stream beds.

Threats listed on the IUCN red list are the loss and destruction of suitable habitat for the species due to overgrazing and inappropriate management. Also, increased tourism activity in the species' breeding habitats has resulted in disturbance to nesting sites. Also, predation by Vulpes vulpes is another threat to the species. Finally, in the past (1960s and 1970s), the use of chlorinated hydrocarbons caused a reduction in breeding success, but with the banning of these pesticides, their impact was reduced, as evidenced by the subsequent breeding density and distribution of the species, as well as the numbers of migration and wintering populations.

According to the list of threats to species of conservation concern (Dimalexis 2009), the reported threats to the species are as follows:

- Expansion - intensification of perennial crops
- Residential development, urban or extra-urban, legal, or unauthorized
- Drainage of wetlands and other land reclamation projects
- Erosion control works, stream bed cleaning, shoreline, and stream embankments.

Threats listed in the IUCN Red List include loss and destruction of suitable habitat for the species due to overgrazing and inappropriate management. Increased tourist activity in the species' breeding habitats has also led to disturbance of nesting sites. Predation by Vulpes vulpes is another threat to the species. Finally, in the past (1960s and 1970s), the use of chlorinated hydrocarbons caused a reduction in breeding success, but with the banning of these pesticides, their impact has been reduced, as evidenced by the subsequent breeding density and distribution of the species, as well as the number of migratory and wintering populations.

The proposed conservation actions, according to the IUCN, are:

- Restoration and protection of the species' habitats.
- Minimize pesticide use (Hagemeijer and Blair 1997).

Boreal Owl (Aegolius funereus)

The European population of the species is estimated to number 94.600 - 236.000 pairs (189.000 - 471.000 mature individuals), while in the EU28 the population is estimated at 20.900 - 128.000 pairs (41.900 - 255.000 mature individuals). The Greek population is estimated to number 10-100 pairs, which is less than 1% of the European population (BirdLife International 2021).

The species is protected by Directive 2009/147/EK (Annex I) and the Bern Convention (Annex II). According to the Greek Red Data Book in Greece there are insufficient data to assess the threatened status (DD), while according to the IUCN at European level the species is classified as least threatened (LC) (BirdLife International 2021). It is also not classified as a species of European interest in terms of protection by Birdlife International, while it is also protected by the CITES International Convention (Appendix II).

It is mainly distributed in the Alps of Central Europe, the Dinaric Alps, Scandinavia, and northern Russia. In Greece, it is found in small populations in the Rhodope Mountains, on Mount Olympus and Pindos.

Forest species. It breeds mainly in coniferous forests of spruce and fir, or mixed coniferous and sycamore, and even in pure pine forests (Hagemeijer and Blair 1997), usually up to 1,800 m altitude. Nests in tree holes or used woodpecker nests. It rarely uses artificial wood boxes. Breeding may begin in February in a good year (Mikkola 1983) and continue until July (Holt et al. 1999), but most eggs are laid in April. It lays 3-7 eggs. It feeds primarily on small mammals, rodents, and shrews, and secondarily on small birds and large insects (Snow and Perrins 1998). It has also been recorded feeding on bats and frogs (Mikkola 1983). The species is generally endemic but disperses in years when prey is scarce (Holt et al. 1999).

Threats listed on the IUCN red list are forestry which has resulted in the elimination of nest cavities and reduced prey populations (Holt et al. 1999). At one time the species often used old black woodpecker (Dryocopus martius) holes, but the decline of the species has resulted in fewer nesting opportunities (Mikkola 1983). Tawny owl (Strix aluco) and martens (Martes spp.) are serious predators of this species, and in some years the latter can destroy a high birth rate and kill many females in the nest. It is also vulnerable to pesticides (König et al. 2008).

The recommended conservation actions according to the IUCN are as follows:

- Careful forest management (selective logging) allows the species to maintain suitable habitat.
- Provision of artificial boxes for nesting, which has proven to be an effective practice, should be continued.
- Nest predation by martens' nests can be avoided by using appropriate techniques at artificial nesting sites (König et al. 2008).

Λευκοπελαργός *(Ciconia ciconia)*

The European population of the species is estimated at 251,000 - 282,000 pairs (502,000 - 563,000 mature individuals), while in the EU28 the population is estimated at 156,000 - 168,000 (313,000 - 335,000 mature individuals). The Greek population is estimated at about 2,000 pairs, which corresponds to <2% of the European population (BirdLife International 2021).

The species is protected by Directive 2009/147/EC (Annex I) and the Bern (Annex II) and Bonn (Annex II) Conventions. According to the Greek Red Data Book in Greece, the species is classified as Vulnerable (VU), while according to the IUCN at European level it is listed as a Species of Least Concern (LC) (BirdLife International 2021). It is also not classified as a species of European interest in terms of protection by Birdlife International (BirdLife International 2017).

Breeds from February to April. Nests in loose colonies of up to 30 pairs (Hancock et al. 1992, Elliott et al. 2020) or as individuals. The main departure from European breeding grounds occurs in August (Hancock et al. 1992), with species travelling in large flocks (Brown et al. 1982, Hancock et al. 1992), arriving in Africa in early October (Brown et al. 1982). The species inhabits open areas (agricultural crops, mainly rice, cotton, and clover, near populated areas), shallow swamps, lake shores (Hancock et al. 1992, Elliott et al. 2020), lagoons, floodplains, rice fields and arable land (Snow and

Perrins 1998), especially where there are scattered trees (Elliott et al. 2020). It generally avoids areas of prolonged cold, wet weather or large areas of tall, dense vegetation such as reedbeds or woodland (Hancock et al. 1992, Elliott et al. 2020). In winter, the species shows a preference for drier habitats (Hancock et al. 1992) such as grasslands, steppes and cultivated fields (Elliott et al. 2020). The species is often found near ponds (Hancock et al. 1992), streams, drifts (Elliott et al. 2020) or rivers (Hancock et al. 1992). The species is carnivorous and has a varied and opportunistic diet. It feeds on small mammals such as mice, juvenile rats (Hancock et al. 1992), large insects (e.g., beetles, grasshoppers, crickets), adult and juvenile amphibians, snakes, lizards, earthworms, fish (Elliott et al. 2020), eggs and offsprings of birds and molluscs (Hancock et al. 1992). The nest is made of sticks (Elliott et al. 2020) and is usually built up to 30 m above the ground (Brown et al. 1982) in trees or on the roofs of buildings and pillars, with two members of the pair involved in its construction. The species nests individually or in loose colonies, often using traditional nest sites (there are records of individual nests being used every year for 100 years) (Hancock et al. 1992, Elliott et al. 2020). Nest sites are usually close to foraging areas but can be up to 2-3 km away (Snow and Perrins 1998).

According to the threats recorded in the list of threats to the species of conservation concern (Dimalexis 2009), the reported threats to the species are:

- Crop expansion.
- Livestock grazing on wet grasslands.
- Transmission lines (electricity, telephone), oil and gas pipelines
- Illegal use of poisoned baits to control " harmful" mammals
- Accidental killing by hunting or poaching
- Construction of dams and flood protection interventions (irrigation works)
- Wetland drainage and other land reclamation works.
- Pollution from agrochemicals discharged into receiving waters (waterlogging of receiving waters)

Threats listed on the IUCN red list are habitat alteration, including drainage of wet grasslands (Elliott et al. 2020) (from dams, embankments, pumping stations and canal systems) (Goriup and Schulz 1990), development, industrialization, and intensification of agriculture (Hancock et al. 1992) (e.g. ploughing of rough grazing land for crop sowing) (Goriup and Schulz 1990). It is also threatened by a lack of nesting sites in some areas (Elliott et al. 2020), as, for example, the roofs of new farm buildings do not support nests and nest substrates on pylons are often destroyed during maintenance work

(Goriup and Schulz 1990). The species may also suffer from the overuse of pesticides (Hockey et al. 2005) in agriculture, and through the consumption of poisoned baits intended to kill large carnivores (Elliott et al. 2020). Another serious threat is collision and electrocution on overhead power lines, especially during migration to Europe (Hancock et al. 1992).

Suggested conservation actions, according to the IUCN, are as follows:

- A report by the International Council for the Conservation of Birds (ICBP) suggests that habitat management for the species should include periodic flooding of grasslands, creation of native grassland mosaics, and maintenance or creation of drifts and ponds (Goriup and Schulz 1990). According to the same report, proposed management strategies in relation to power poles, such as undergrounding or marking overhead cables, are also important to reduce the risk of electrocution and collision (Goriup and Schulz 1990). It is also important to avoid disturbance to nests during pole maintenance.
- Due to the species' habit of defecating on their legs to regulate body temperature in warm climates, it is not recommended that collars be placed on the legs (dry uric acid accumulates in the legs and hardens around the leg collars, causing them to tighten and lead to injury) (Goriup and Schulz 1990). Therefore, other methods of movement tracking such as satellite telemetry or flap tags are recommended (Goriup and Schulz 1990).
- Monitoring of breeding, migration, wintering numbers and ecological changes in key breeding habitat locations.
- Sustainable management of river valleys and wet grasslands.
- The abandonment of grasslands, afforestation of farmland and drainage of wet meadows and inland wetlands in key breeding sites should be stopped.

***Red Kite* (*Milvus milvus*)**

The European population of the species is estimated at 32,500 - 38,300 pairs (65,100 - 76,600 mature individuals), while in the EU28 the population is estimated at 29,700 - 34,800 pairs (59,400 - 69,500 mature individuals) (BirdLife International 2021). The population trend of the species, according to the IUCN red list, both at European and EU28 level, is estimated to be increasing.

The species is protected by Directive 2009/147/EK (Annex I) and the Bern (Annex II) and Bonn (Annex II) Conventions. According to IUCN the species is listed as a species of Least Concern (LC) (BirdLife International 2021), while according to the Greek Red Data Book the species is classified as data deficient (DD). It is also listed as a SPEC 1 species of European interest for protection by Birdlife International (BirdLife International 2017) and is also protected under the CITES International Convention (Appendix II).

The European population of the Red Kite accounts for 95% of the world's population. It breeds from Spain and Portugal east to central Europe and Ukraine, north to southern Sweden, Latvia, and the UK, and south to southern Italy. There is a population in northern Morocco. Birds that live or breed in the north migrate south in winter, mostly to the west of the breeding range, but also to eastern Turkey to the edge of Iran.

The species is a predator of open areas with scattered small or large patches of woodland, and unlike the Black Kite, with which it often shares the same ecosystem, it is not directly dependent on the presence of water. It prefers habitats in agricultural landscapes with clumps of trees, often in parks and on the edge of forests, and rarely in swamps and marshes. It often takes advantage of favorable air currents in narrow river valleys and on mountain slopes. (Chandrinos and Dimitropoulos 2000).

The Red Kite is a large predator, characterized by its general reddish-brown plumage and long, mottled forked tail.

The Red Kite has the biological ability to reproduce from the 1st year of its age, but usually this happens from the 3rd year, while there are also deviations in monogamy or polygamy of pairs, with the first case being the majority. The breeding season starts from mid-March in the southern regions until early May in the north.

It prefers to nest in wooded areas adjacent to open territories. The nest is in a branch of a tall tree (usually an oak, birch, or pine), 7 to 30 meters above the ground, and is usually an older nest of another bird, such as a raven or hawk. The materials are usually coarse dry twigs, sheep's wool or rags taken from the ground, but not fresh twigs. Any waste material, such as paper and cans, can also be used (Chandrinos and Dimitropoulos 2000). The litter consists of 2 or 3 (sometimes 4, rarely 1 or 5) eggs, laid at intervals of 3 days. Incubation is usually carried out by the female, starting with the first egg and lasting 28-33 days. The female feeds the offsprings with food (small mammals and birds) provided by the male for about 2 weeks, when they begin to develop their feathers. Thereafter, both parents participate in feeding until 4 weeks, when the offsprings begin to feed themselves. The second offspring usually becomes malnourished and dies.

The species' diet consists mainly of corpses and small to medium-sized mammals and birds. Reptiles, amphibians, and invertebrates complete the diet. Most birds in north-eastern Europe are migratory. They migrate south from their breeding grounds between August and November, returning between February and April (Snow and Perrins 1998). Birds usually occur singly or in pairs, but sometimes form small flocks, possibly family groups during migration (Ferguson-Lees and Christie 2001).

Threats on the IUCN Red List include consumption of poisoned bait by predators (foxes, wolves, bears) and indirect poisoning by pesticides and rodents poisoned with rat poisons, particularly in the wintering areas of France and Spain where populations have declined rapidly (del Hoyo et al 2006). Also, the intensification or conversion of farming methods, such as in France, where entire populations disappeared when large areas of pasture were converted to cereal crops. The reduction of grazing animals and the intensification of agriculture, leading to chemical pollution, homogenization of landscapes and ecological degradation, also threaten species. Wind turbines are a potentially serious threat for the future (Mammen et al 2009) and more research is needed to assess the extent to which wind farms pose a risk. Other less significant threats include electrocution and collision with power lines (Mionnet 2007), hunting and trapping (Mionnet 2007), road accidents, deforestation, egg collection (at the local level). Finally, in France and Spain, the reduction in the number of rubbish dumps is another factor in the decline (Mionnet 2007). In Greece, the Red Kite no longer nests and is one of the rarest predators, as the number of migrations has also decreased dramatically. The destruction of lowland forests and pesticides are the main causes (Chandrinos and Dimitropoulos 2000).

According to the IUCN, the recommended conservation actions are as follows:

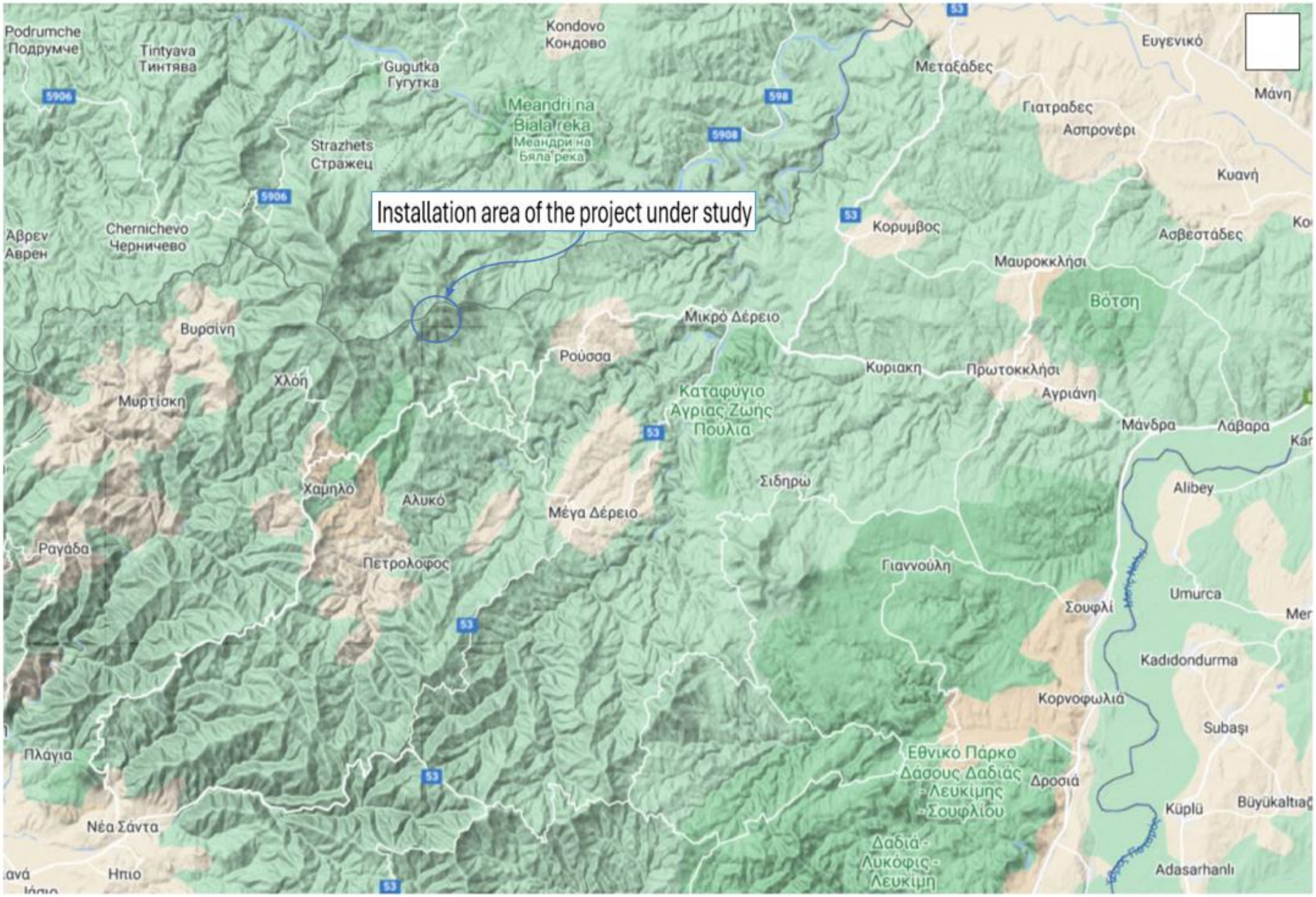
- Continue to monitor population trends and reproduction of the species.
- Continue reintroduction efforts.
- Regulation of pesticide use.
- Reduce persecution through enforcement and awareness campaigns.
- Conduct further studies and research on the impacts of changing land use practices.
- Promote changes in EU and national agricultural policies.

- Increase the area of suitable forest land and forests with protected status.
- Consider extending supplementary feeding to areas with low food availability.
- Promote inspection of feeding stations to ensure that they comply with health regulations.

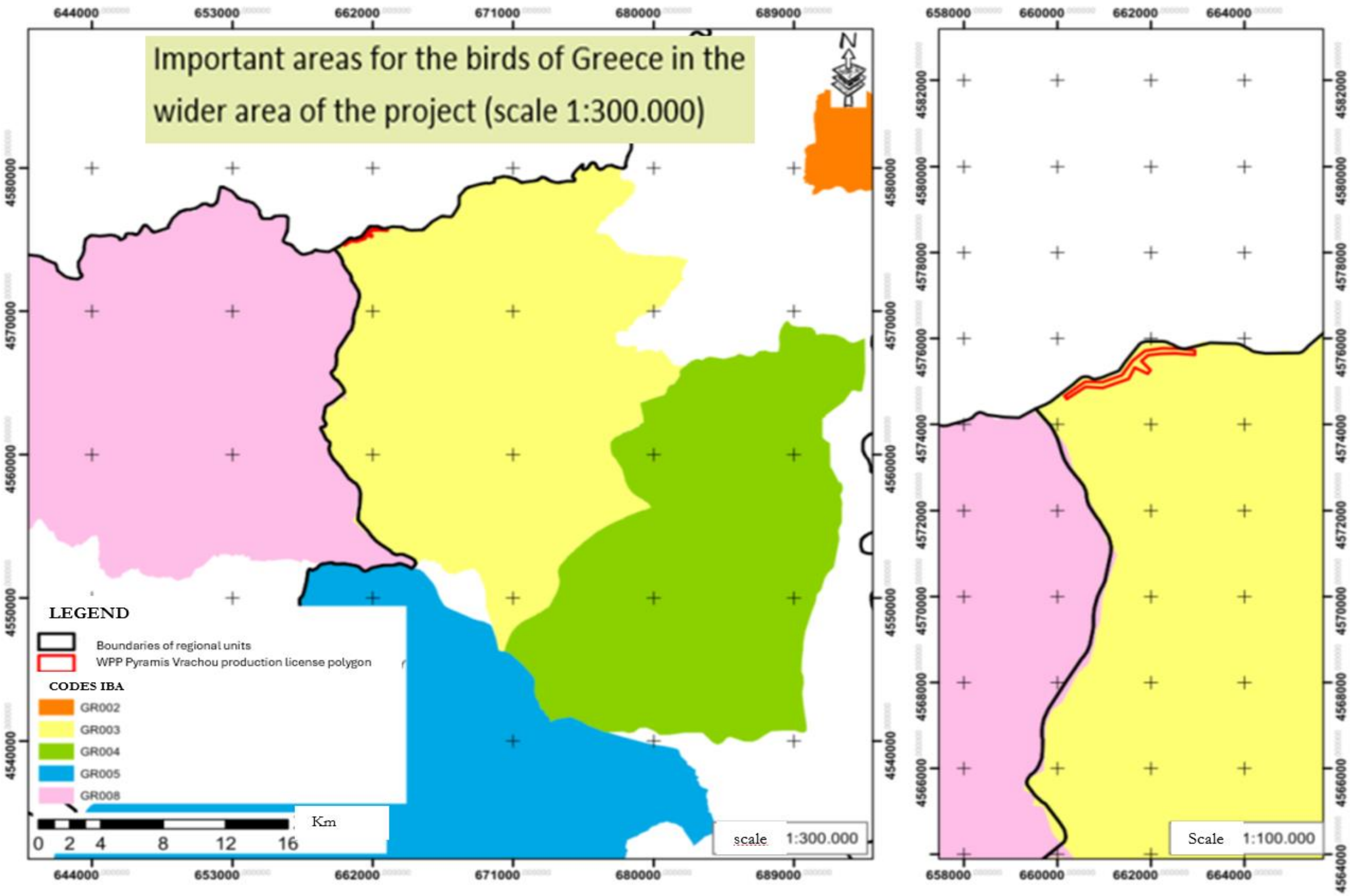
Capture of the above on Documentation Maps

The following is a summary of everything mentioned in the previous sections regarding the project site and the field research area and their location within the Natura 2000 network area of the broader region, within the IBAs of the broader region, as well as in relation to National Parks and Wildlife Refuges. A land use map of the broader area is also presented, according to the land use mapping of the Corine land cover database 2018, which also shows the location of the project's production license blocks and the field research area.

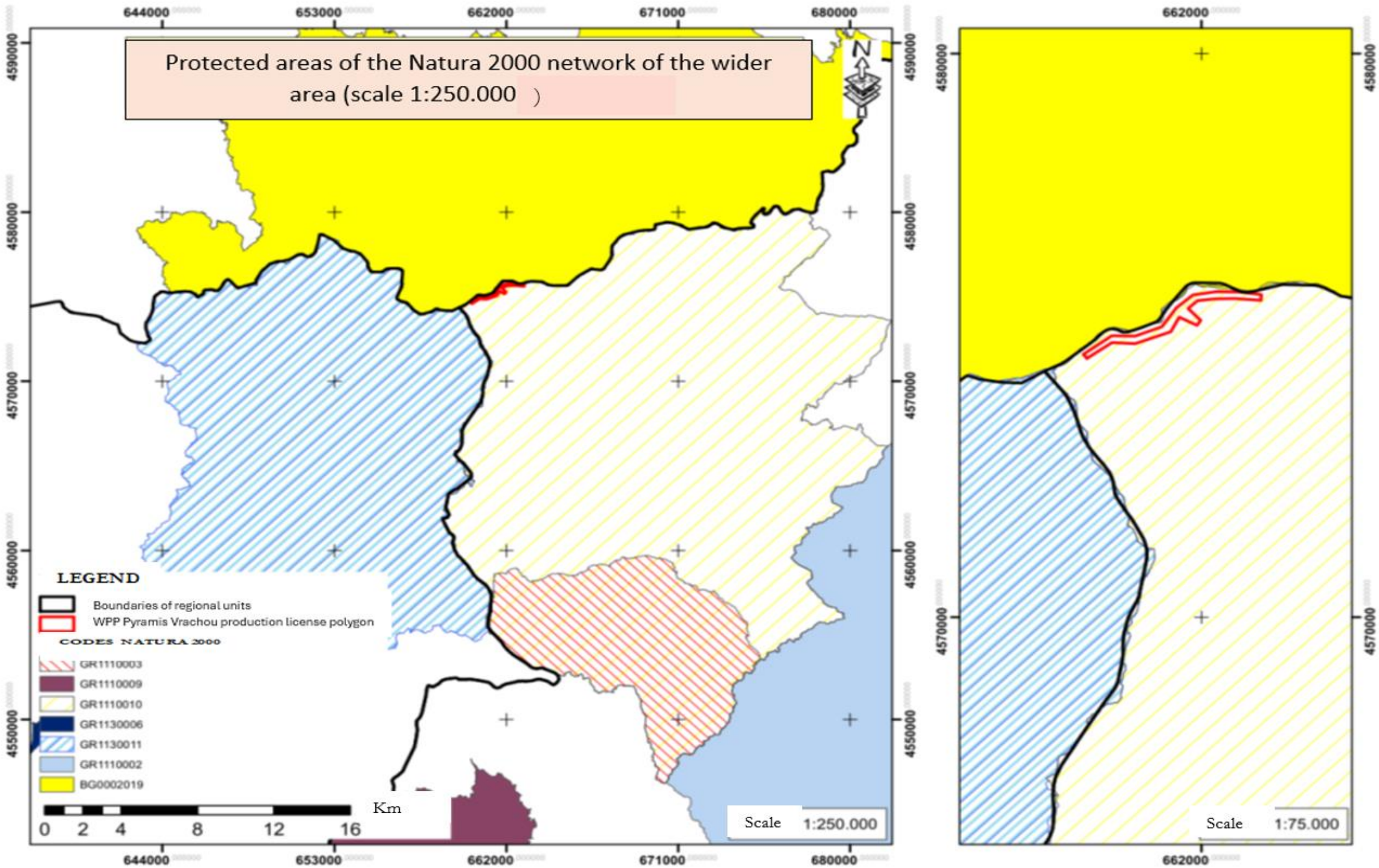
Regarding the species of interest, as defined on the basis of the data examined in the previous section, maps with their distribution and habitats in the wider project area are presented below, according to the data from the Monitoring and Evaluation Program of the Conservation Status of Species and Habitat Types in Greece of the Ministry of Environment and Natural Resources of Greece in response to the country's obligations under Directives 92/43/EEC and 2009/147/EC (currently known as 79/409/EEC), the cartographic distribution data of the International Union for the Conservation of Nature (IUCN), and the data of the International Union for Conservation of Nature (IUCN) (https://www.iucnredlist.org/, available online on 15/03/2023), the data from the Red Book of Endangered Animals of Greece (Legakis and Marangou 2009). The critical habitat data were extracted from the critical habitat data available on the website of the Ministry of Environment for 76 SPAs of the country (https://ypen. gov.gr/perivallon/viopoikilotita/diktyo-natura-2000), and only relate to the GR1110010 SPA (except for the Aegypius monachus designation species), as these do not exist for the other SPAs under study. To fulfil the above obligation, based on the requirements of the SEA, habitat maps were created, in the field of which the suitable habitats of the species of interest are depicted based on their ecological requirements and vegetation structure, as extracted from the database and mapping for land cover (Corine land cover 2018).



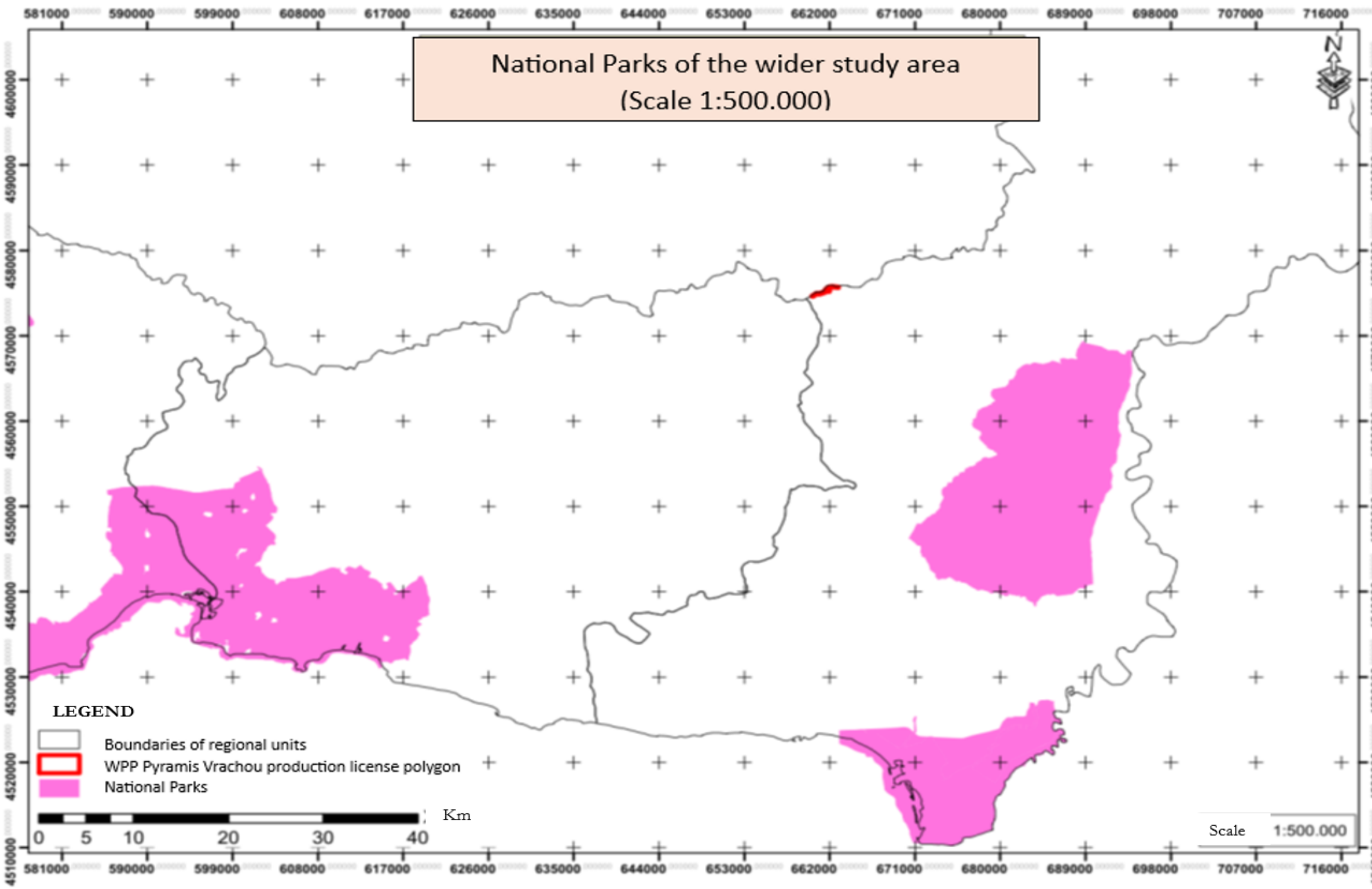
Map 1: *Orientation map of the study area and the broader area of the WPP at the location of Pyramis Vrachou*



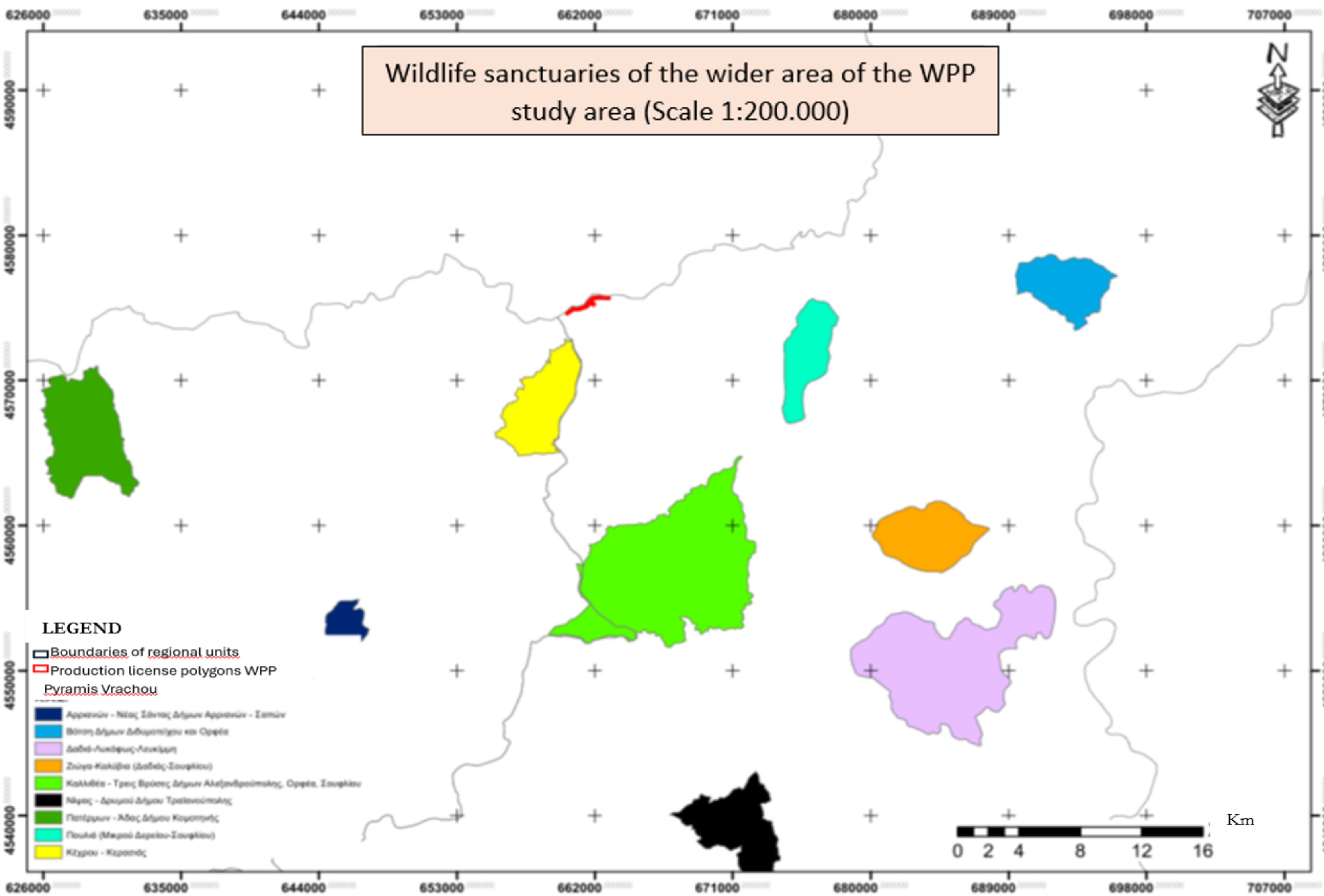
Map 2: *Map of the location of the site of the installation of the WPP in the location of Pyramis Vrachou within the IBA GR003*



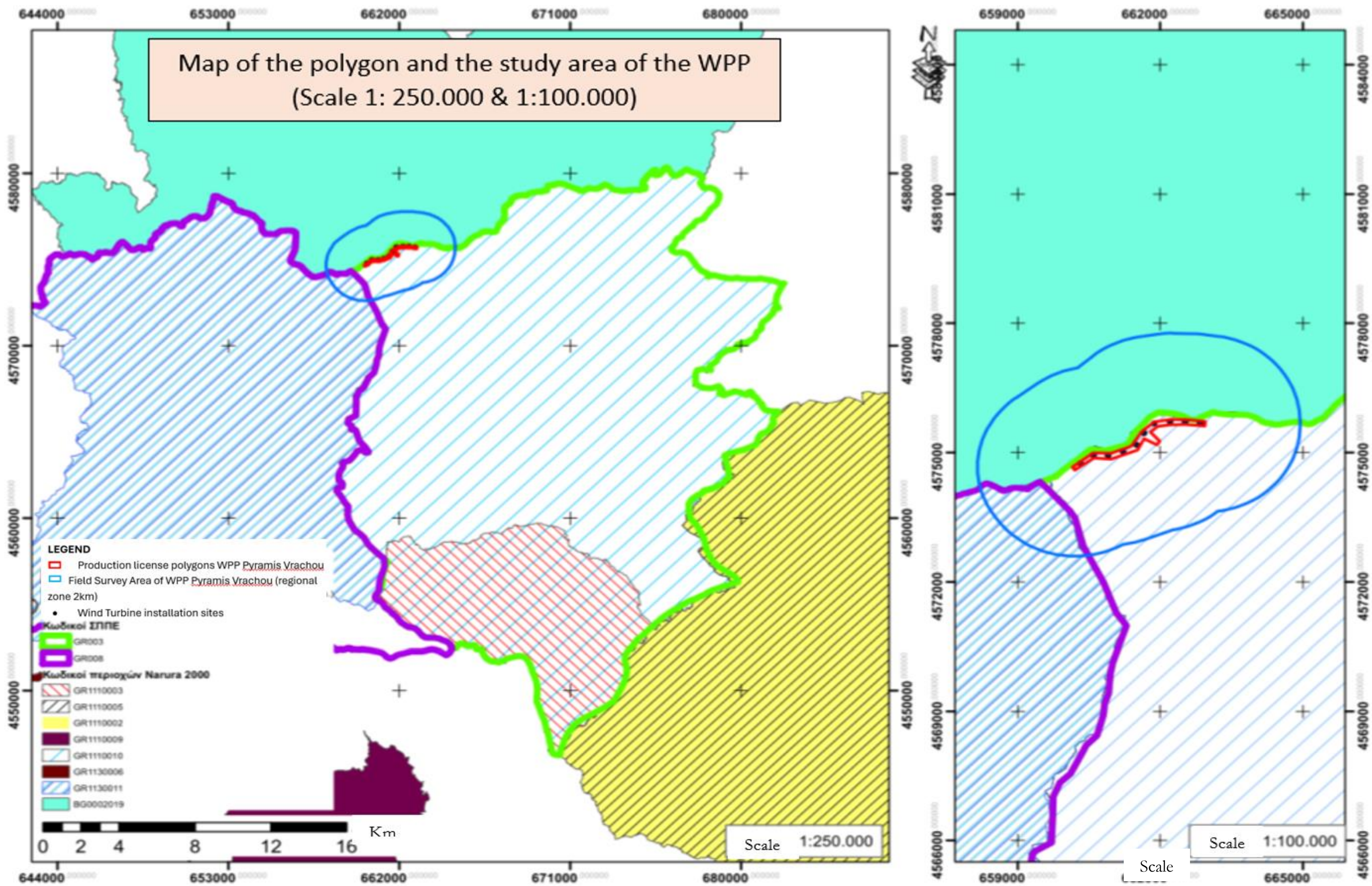
Map 3: *Map of the location of the site of the installation of the WPP at the location of Pyramis Vrachou within the Natura 2000 network area SPA GR1110010*



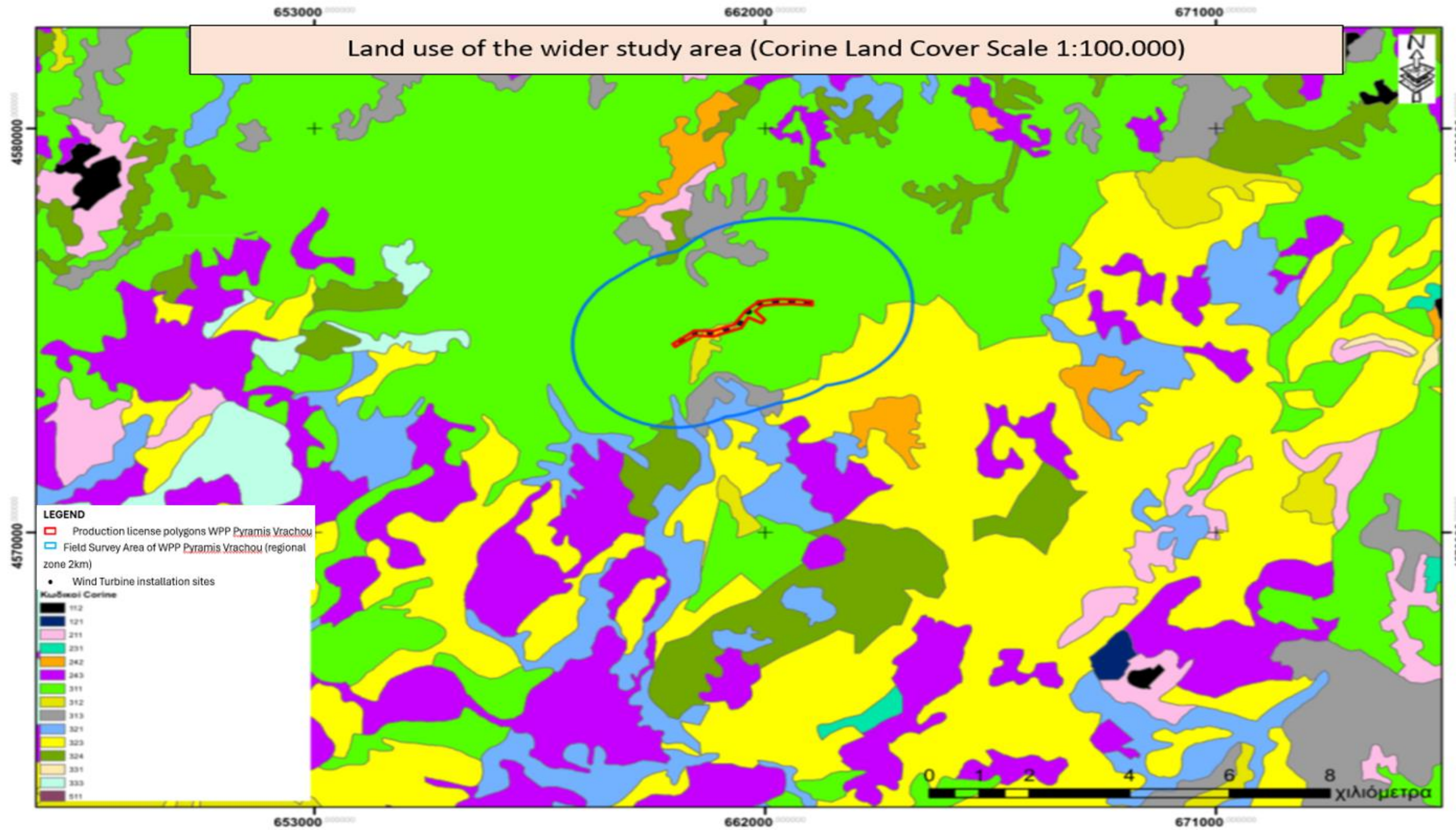
Map 4: *Map of the location of the installation area of the WPP in the location of Pyramis Vrachou outside the National Parks*



Map 5: *Map showing the location of the Pyramis Vrachou WPP site outside the Wildlife Refuges of the broader*

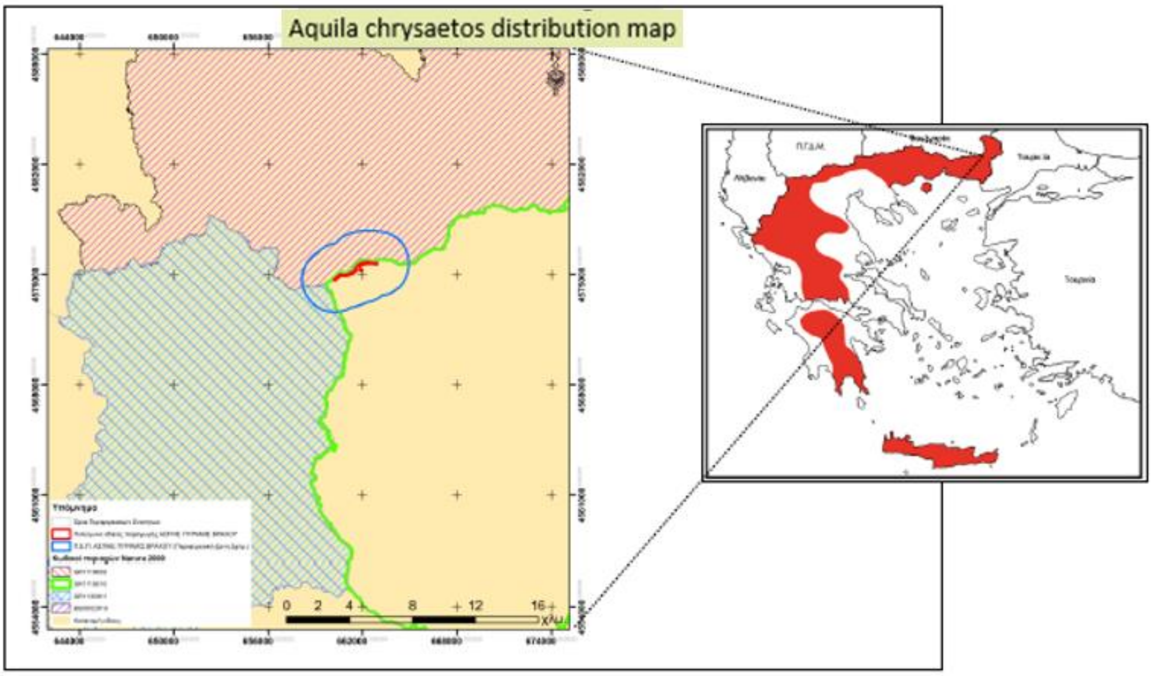


Map 6: *Map of polygons with production license and field research area of the studied WPP at the location of Pyramis Vrachou*

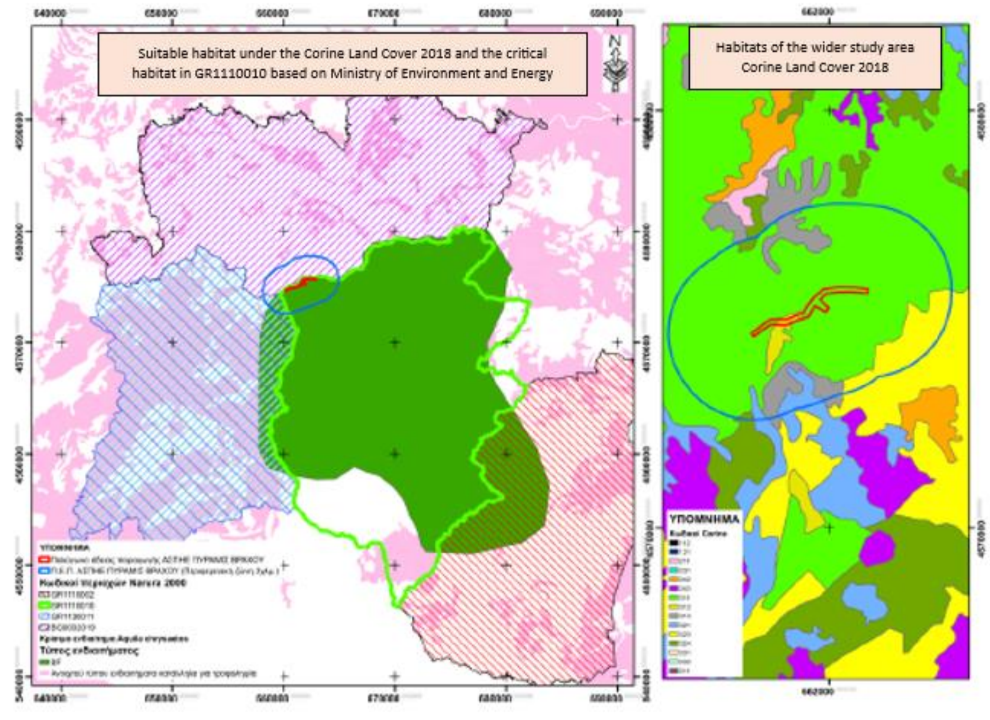


Map 7: *Land use map of the study area, according to the land cover database and mapping (Corine land cover 2018)*

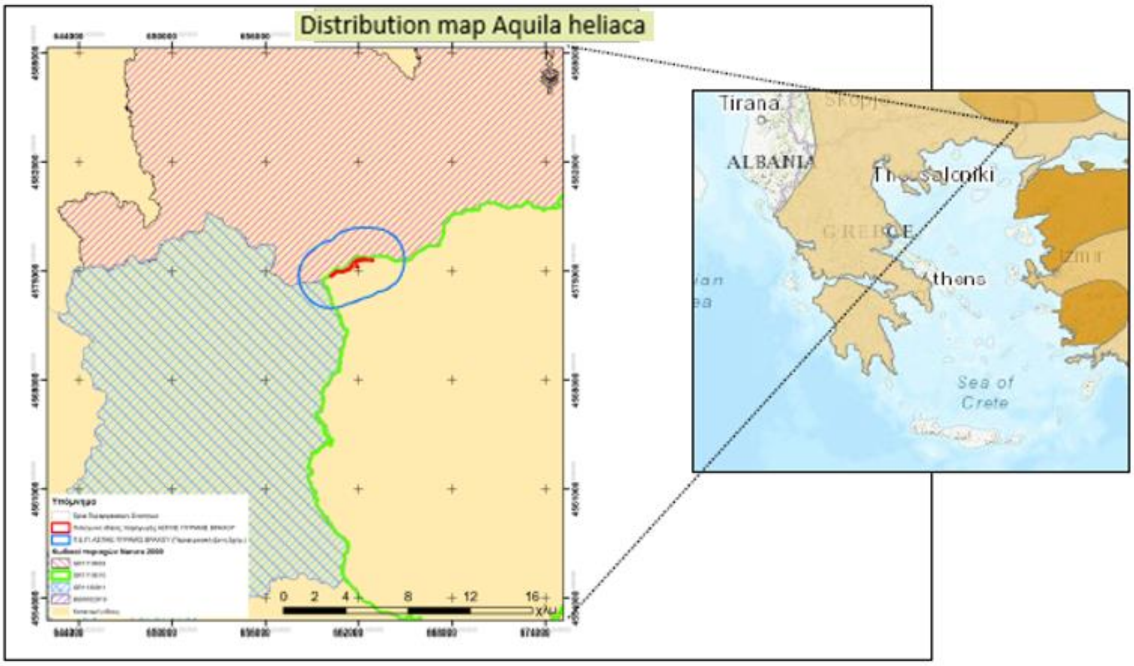
Species of Interest in Research Area



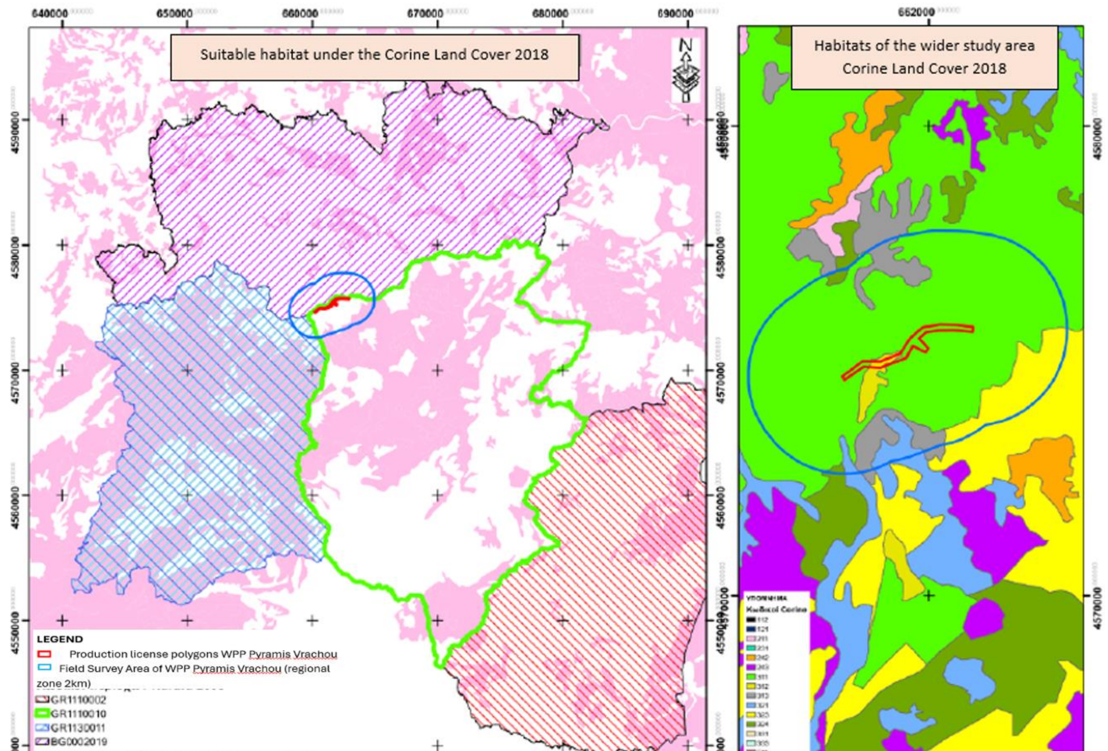
Map 8: *Distribution map of the golden eagle (Aquila chrysaetos) in the study area*



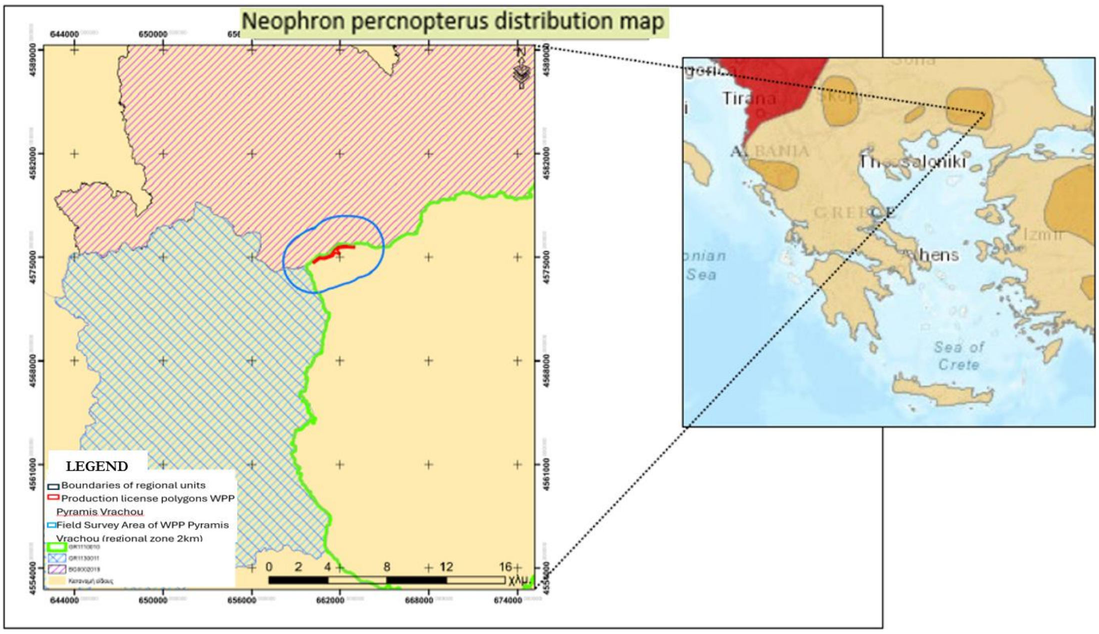
Map 9: *Habitat map of the golden eagle (Aquila chrysaetos) in the study area*



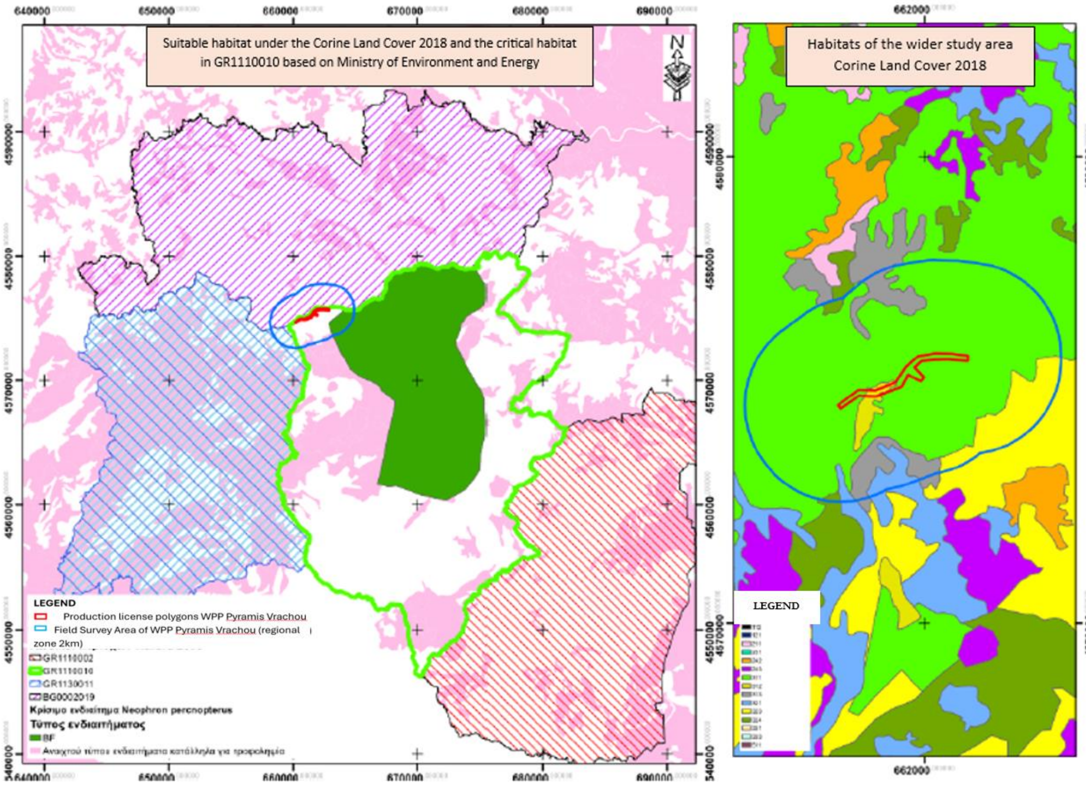
Map 10: *Distribution map of the Aquila heliaca in the study area*



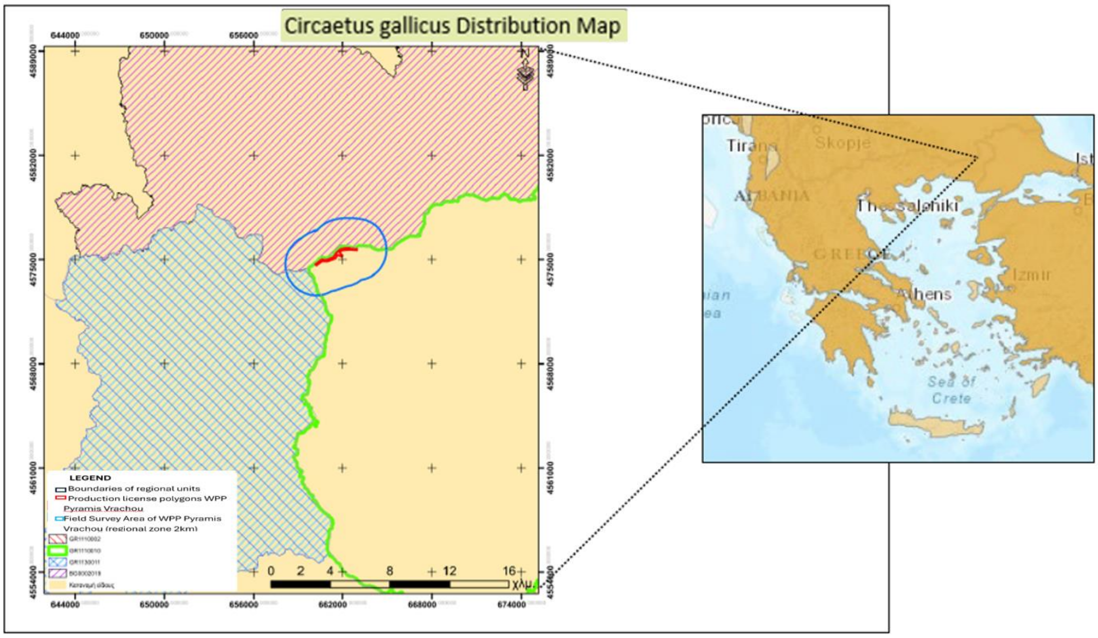
Map 11*: Habitat map of the Aquila heliaca in the study area*



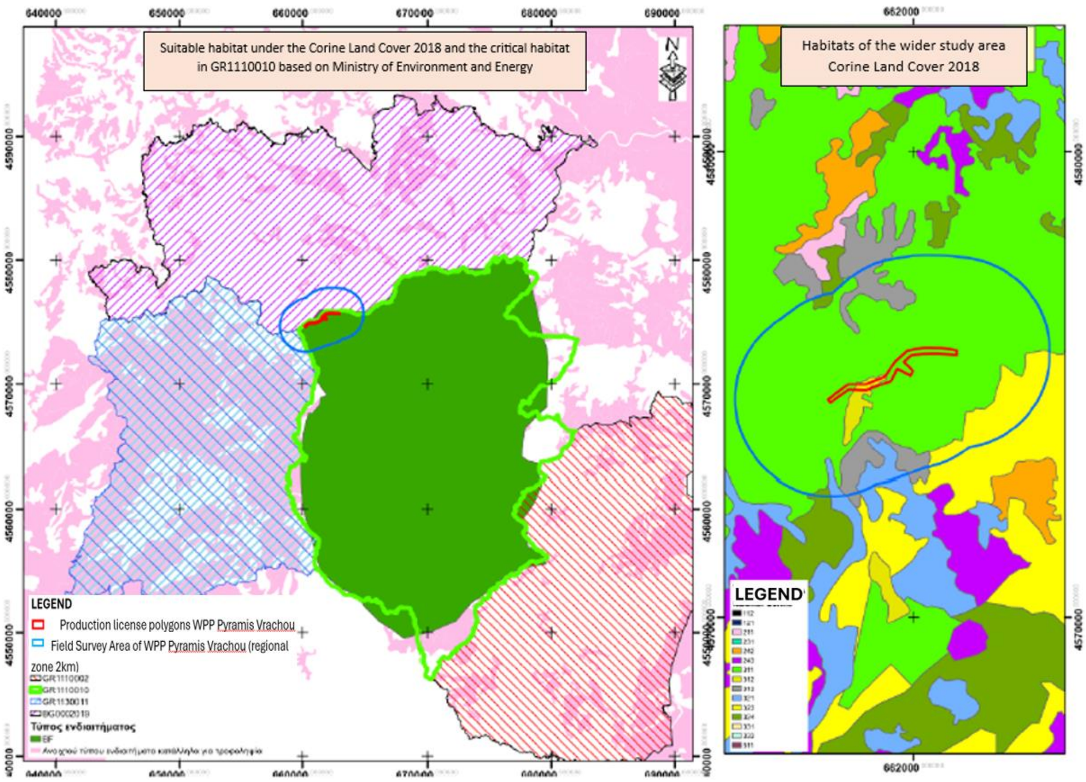
Map 12: Distribution map of the Egyptian vulture (Neophron percnopterus) in the study area



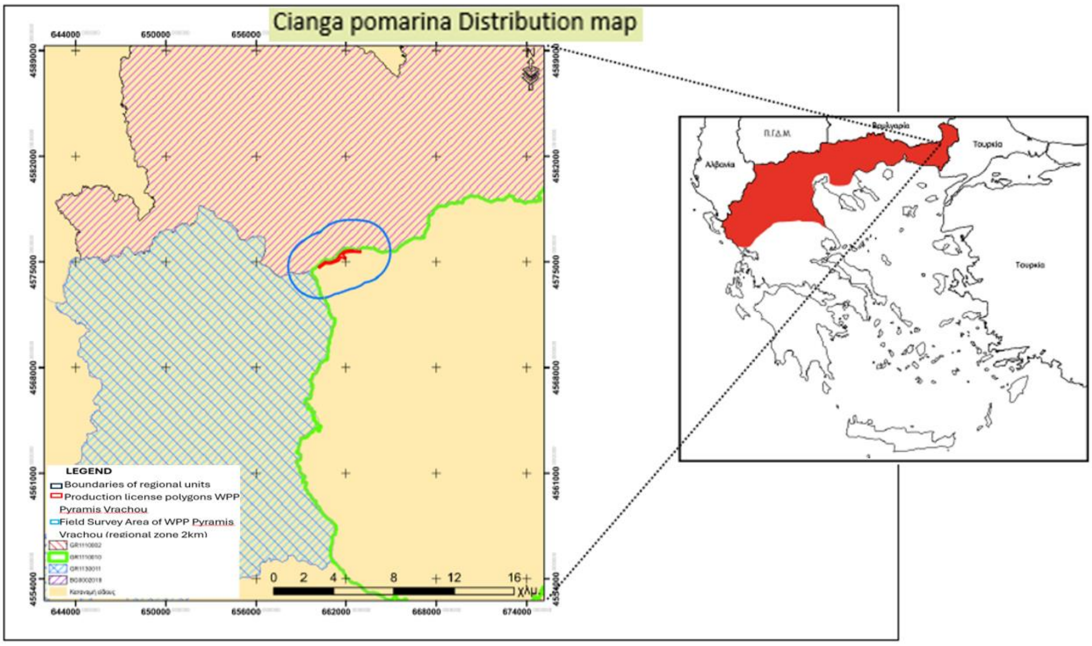
Map 13: Habitat map of the Egyptian vulture (Neophron percnopterus) in the study area



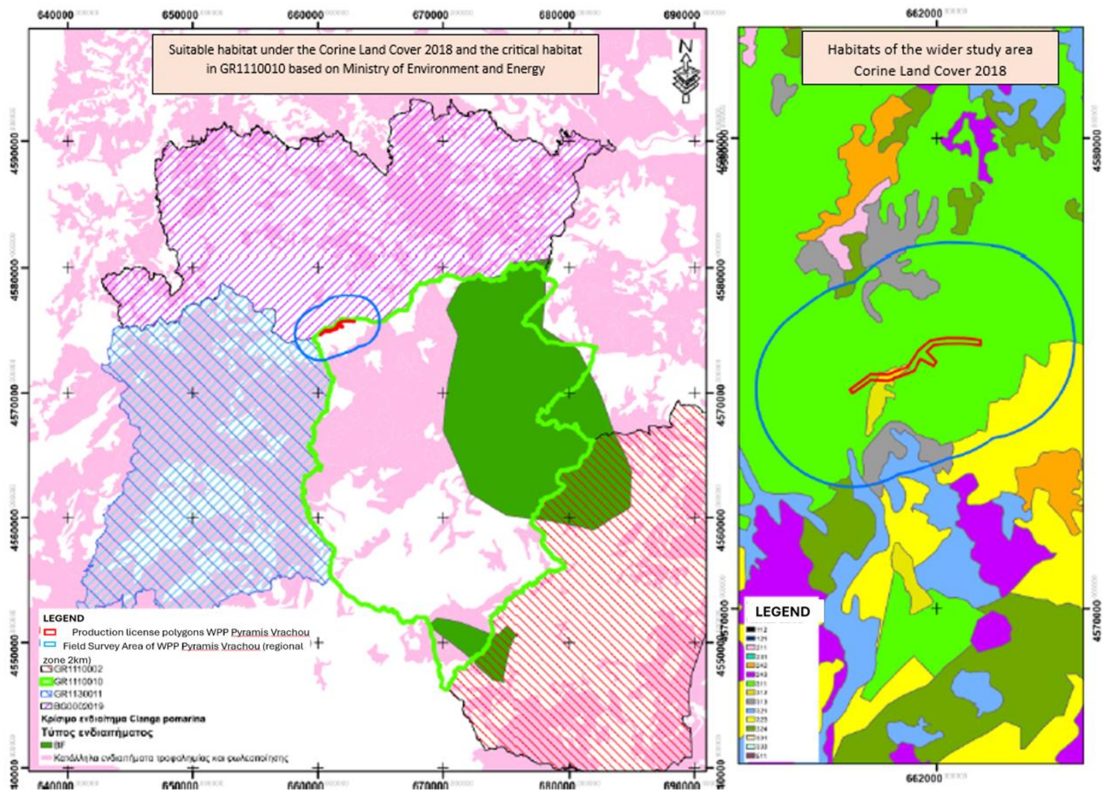
Map 14: *Distribution map of the Snake eagle (Cicaetus gallicus) in the study area*



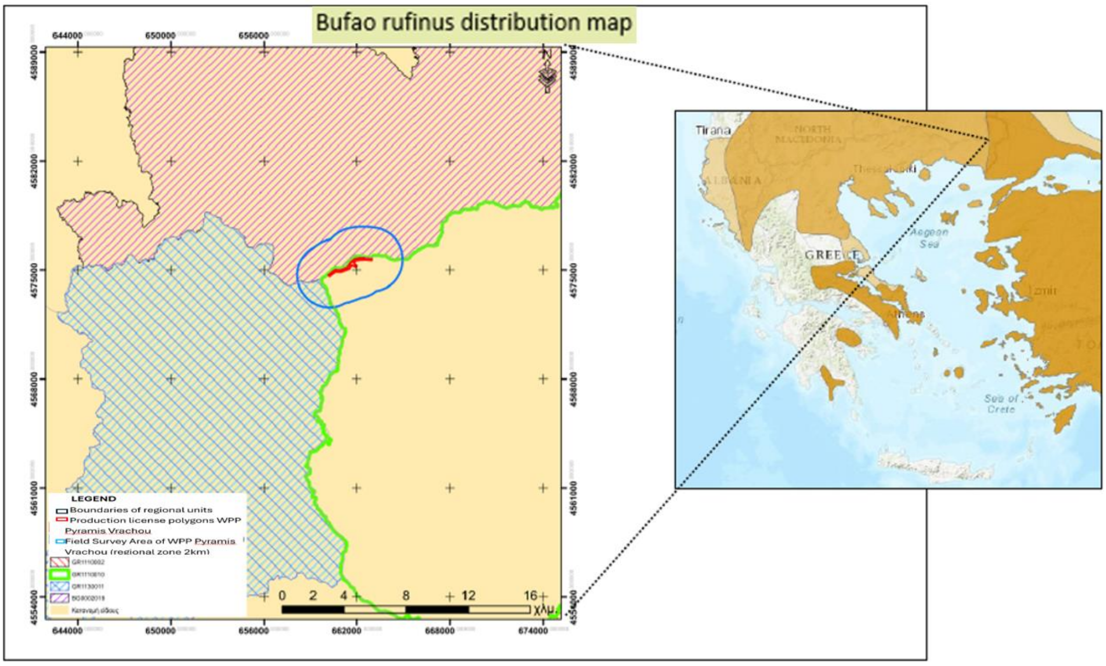
Map 15: *Habitat map of the Snake eagle (Cicaetus gallicus) in the study area*



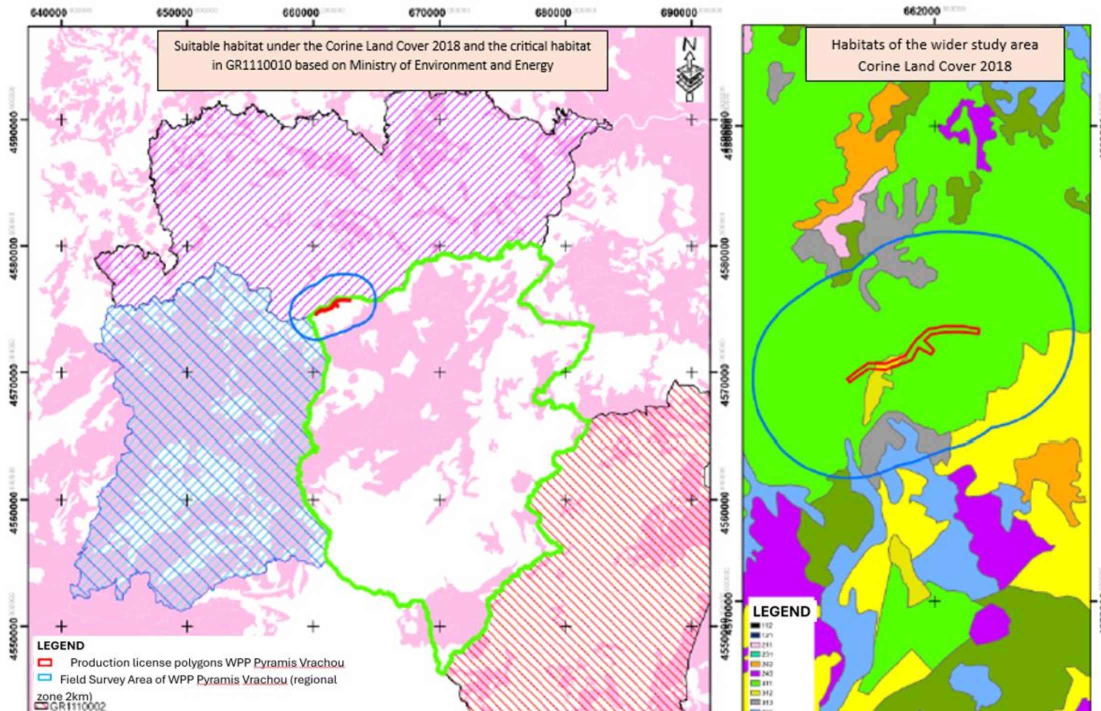
Map 16: Distribution map of the Clanga pomarina in the study area



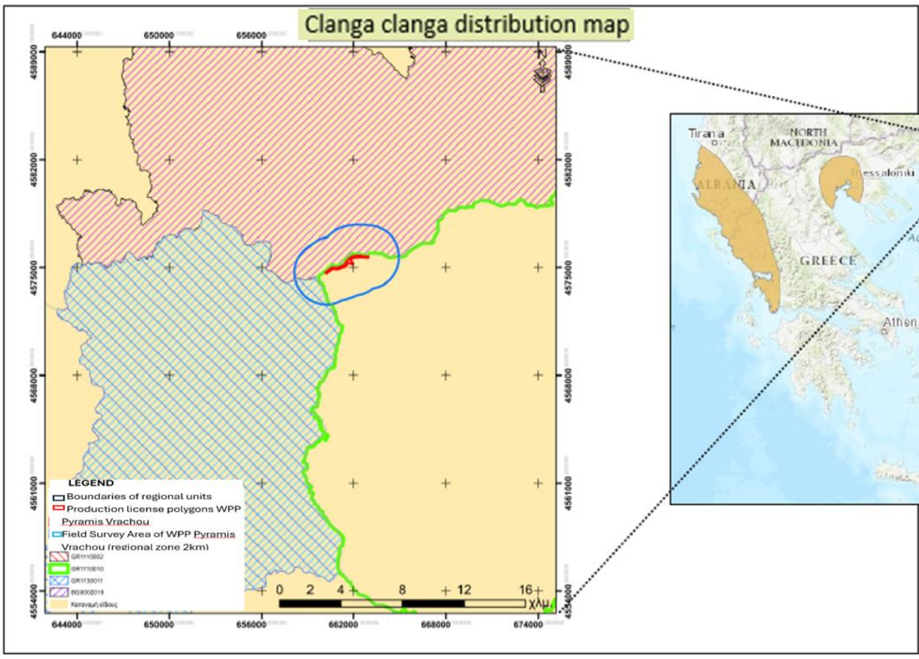
Map 17: Habitat map of the Clanga pomarina in the study area



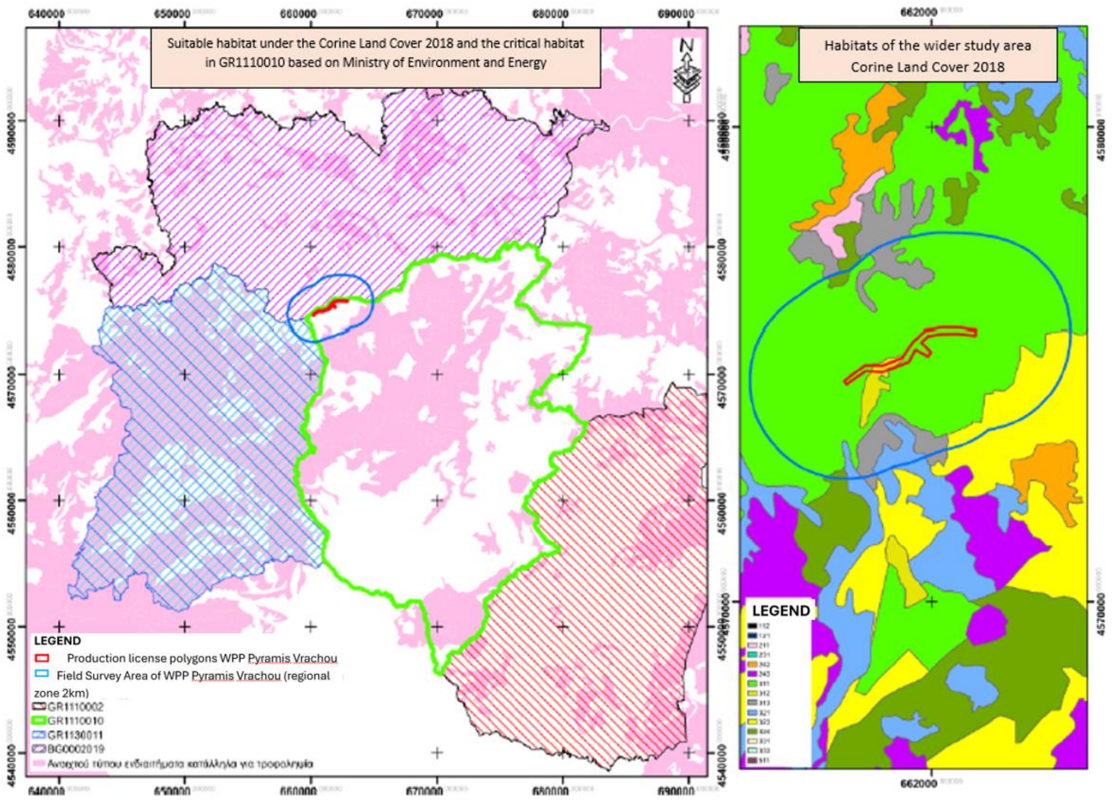
Map 18: *Distribution map of Buteo rufinus in the broader study area*



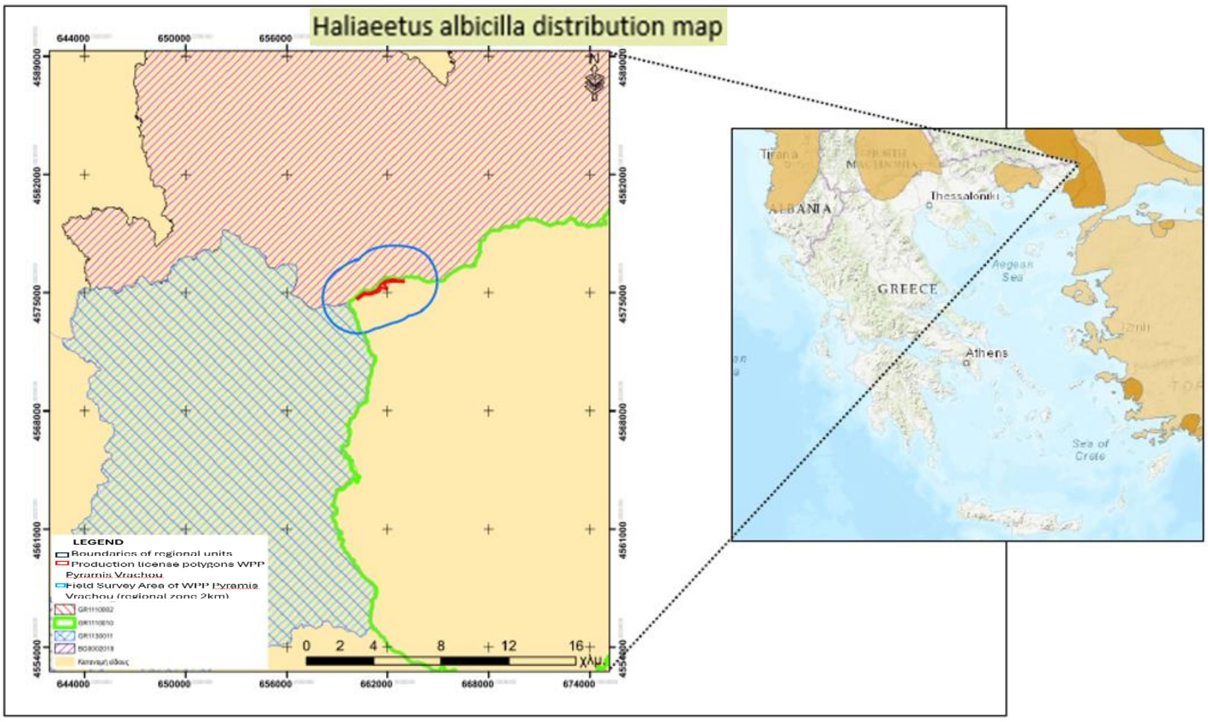
***Map 19**: Habitat map of Buteo rufinus in the broader study area*



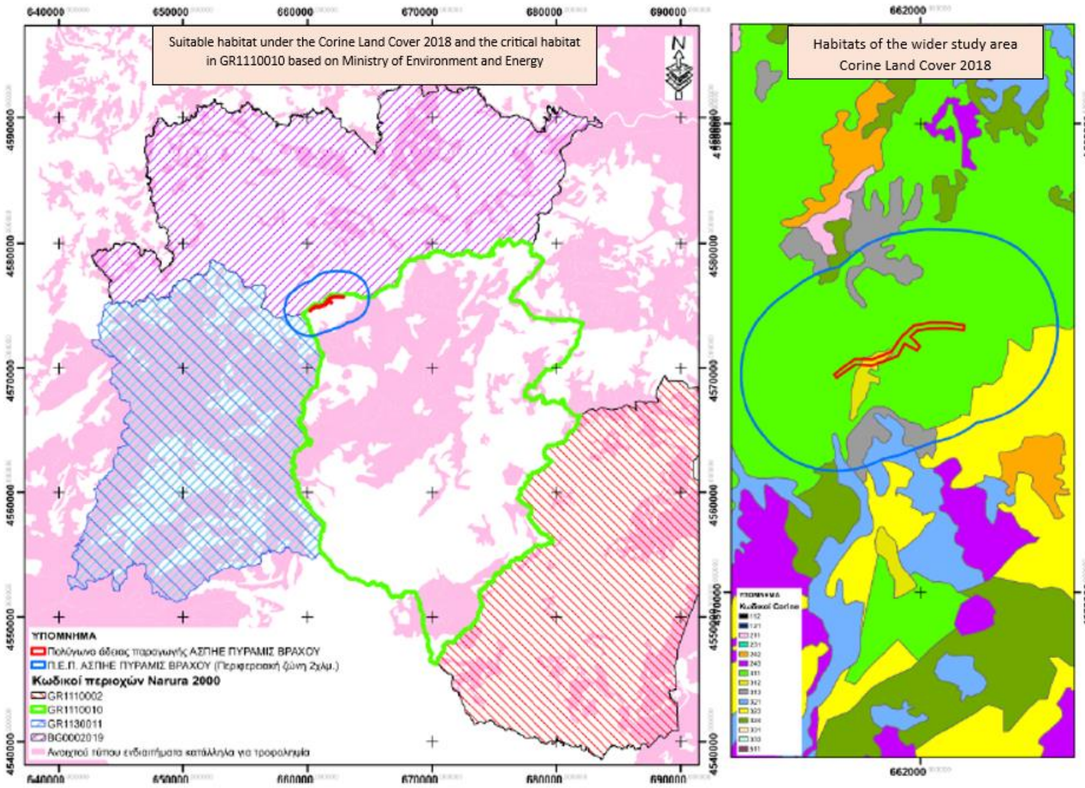
***Map 20**: Distribution map of the Clanga clanga in the broader study area*



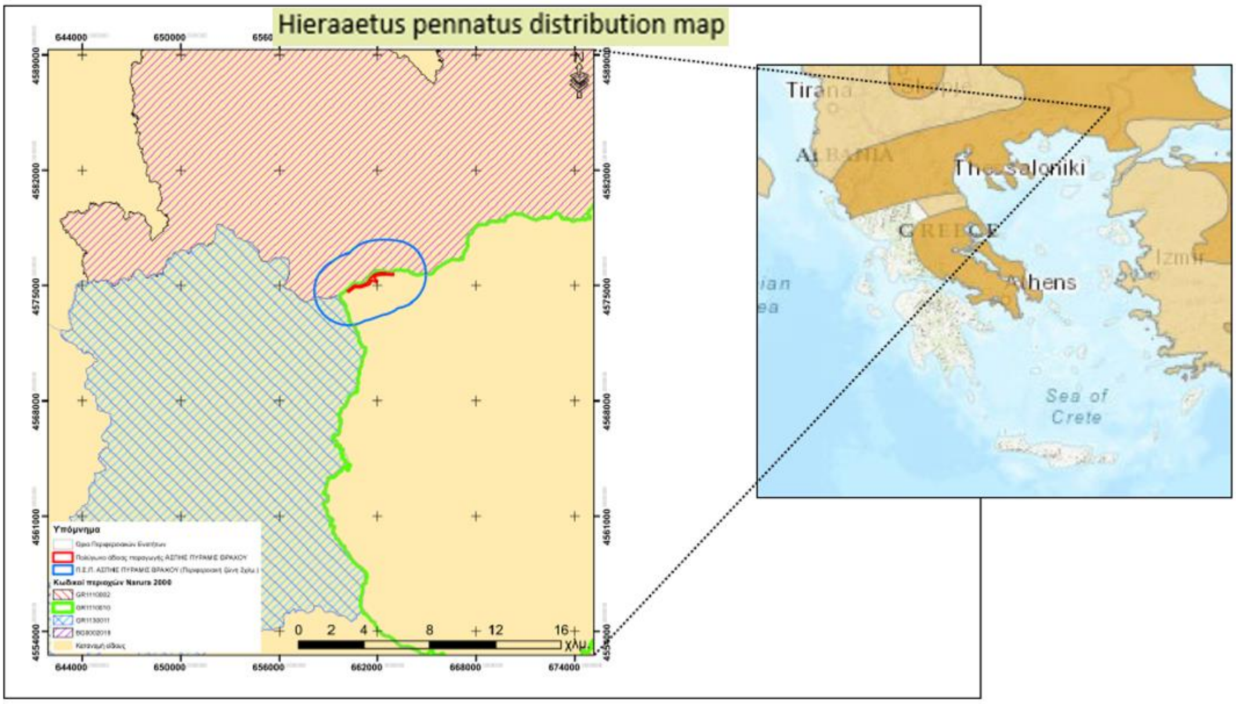
***Map 21**: Habitat map of Clanga clanga in the broader study area*



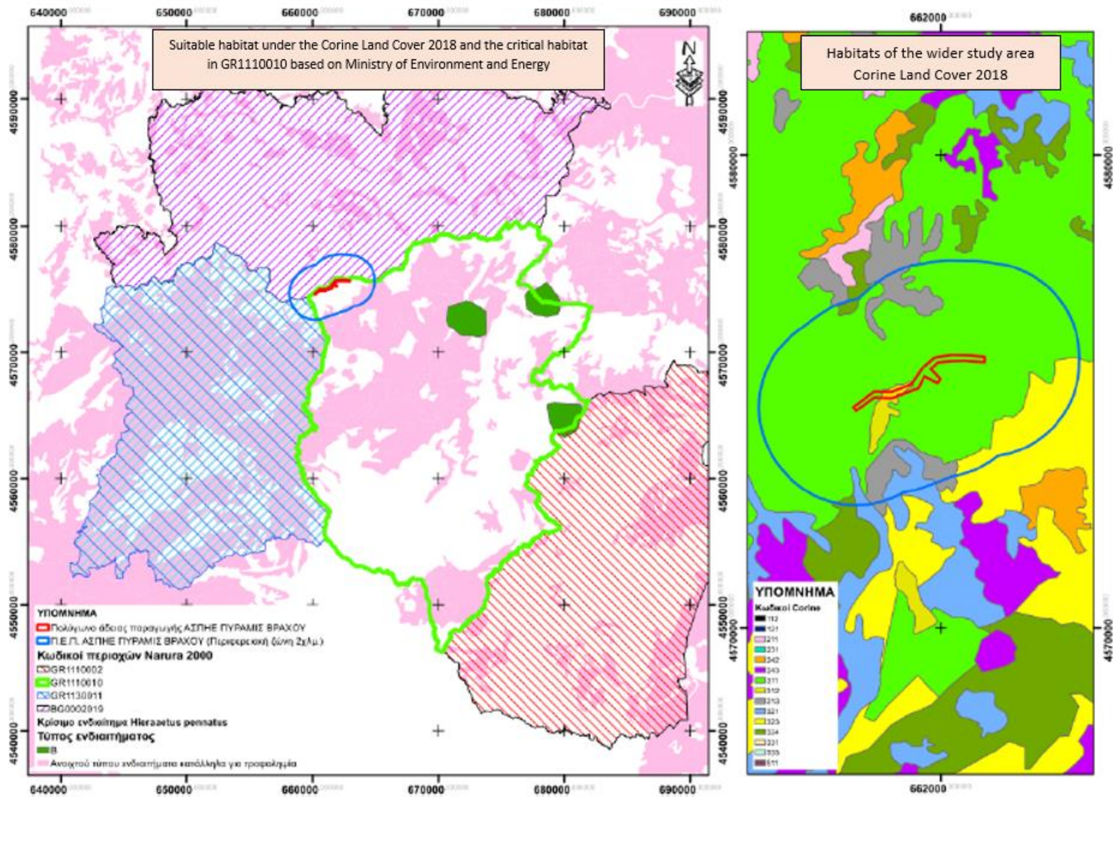
***Map 22**: Distribution map of the Halieetus albicilla in the broader study area*



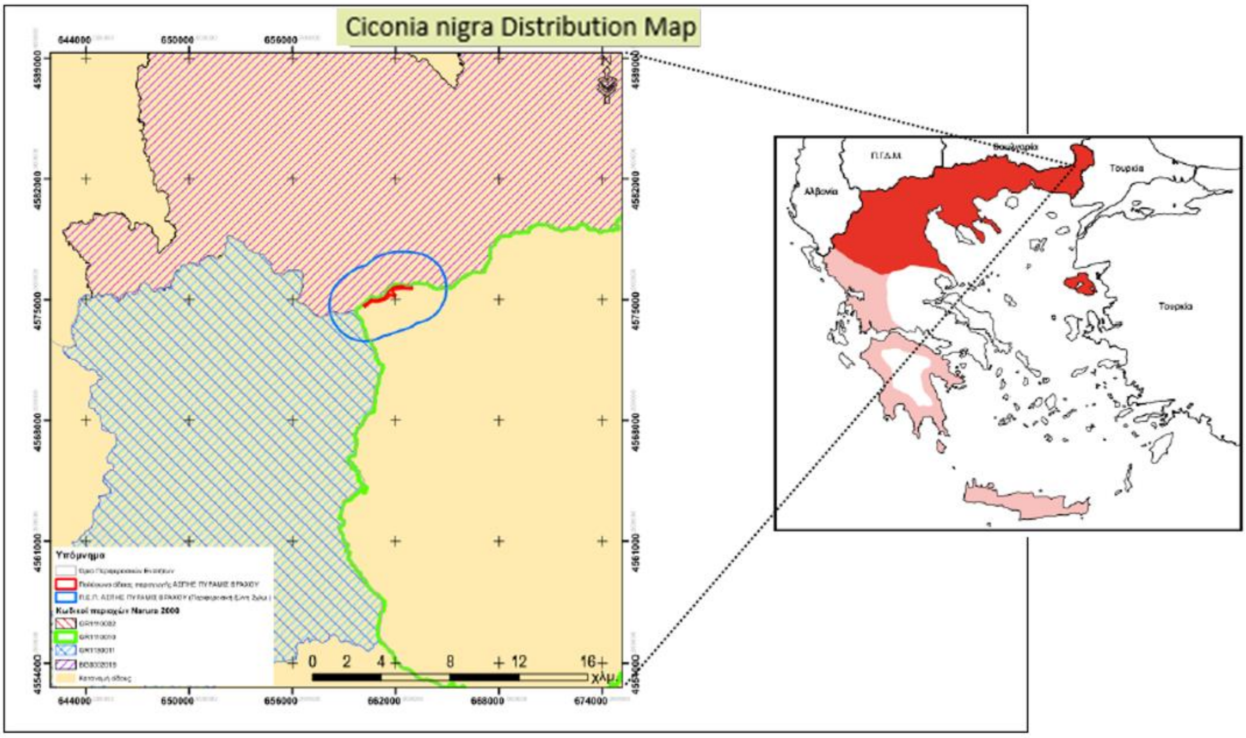
***Map 23**: Habitat map of the Halieetus albicilla in the broader study area*



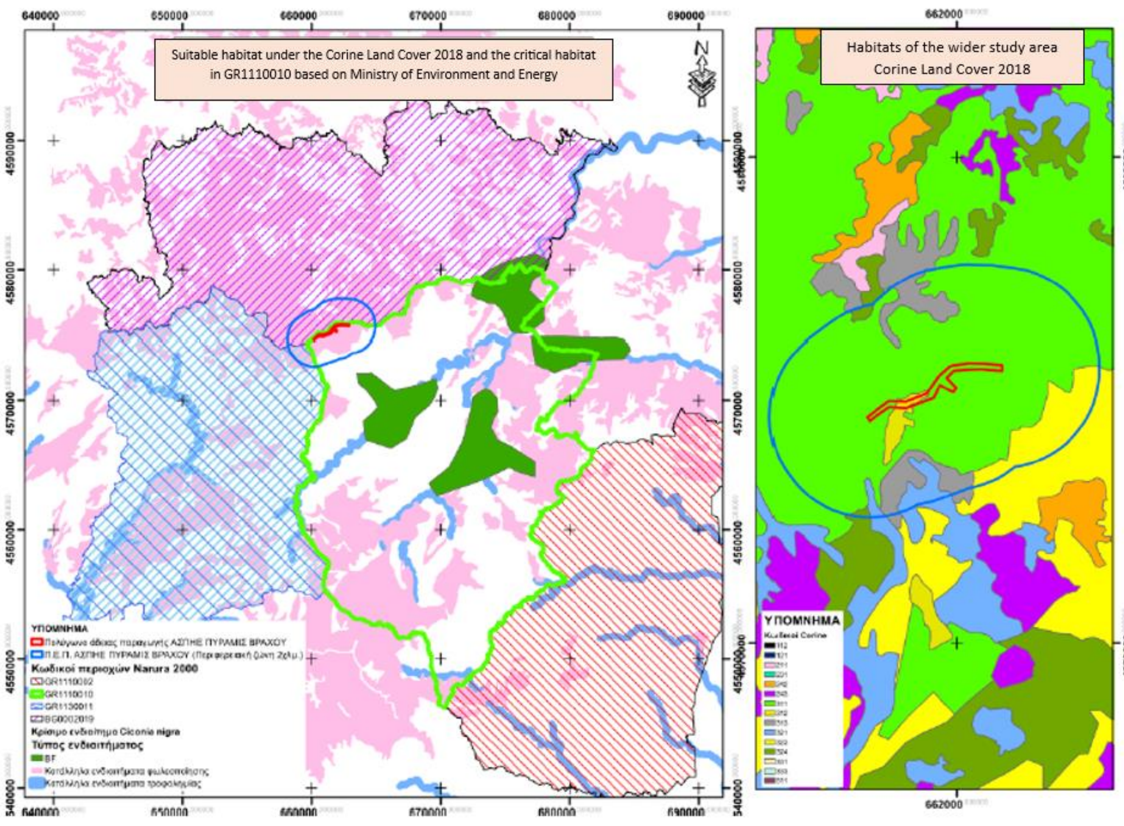
__Map 24:__ Distribution map of the Hieraaetus pennatus in the broader study area



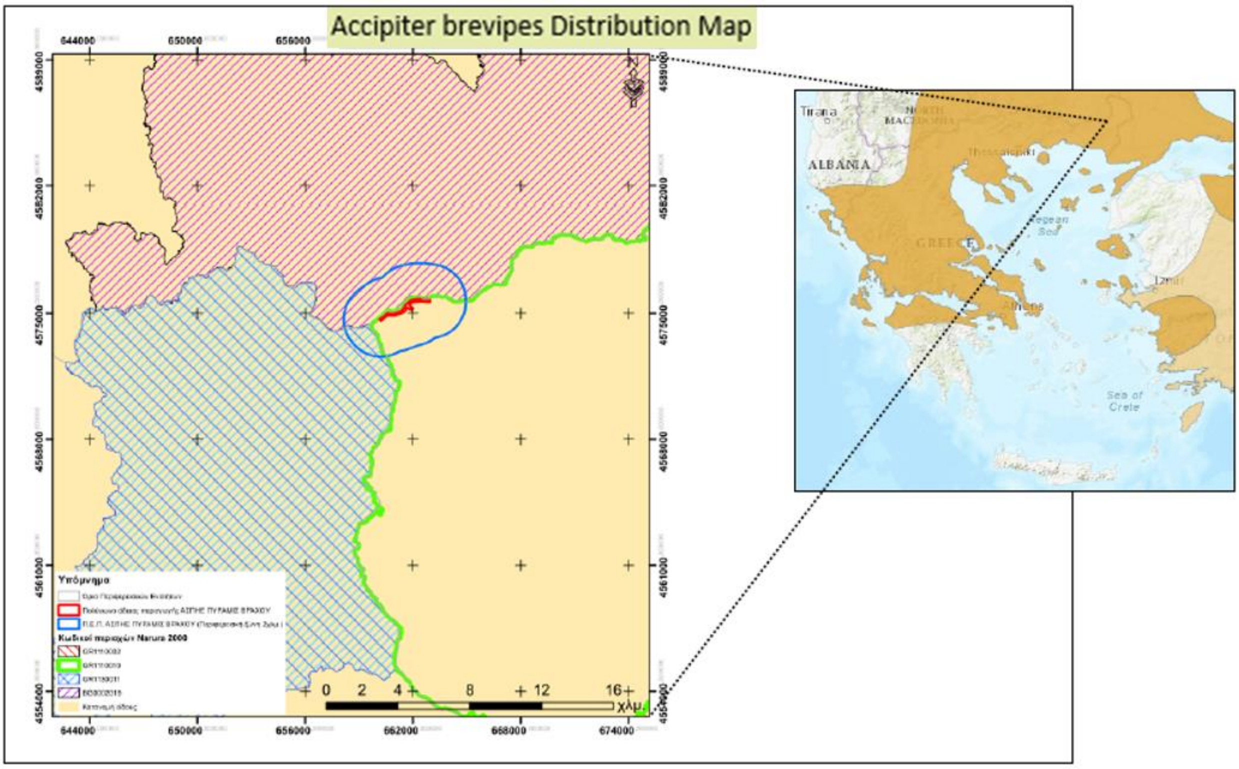
__Map 25__: Habitat map of the Hieraaetus pennatus in the broader study area



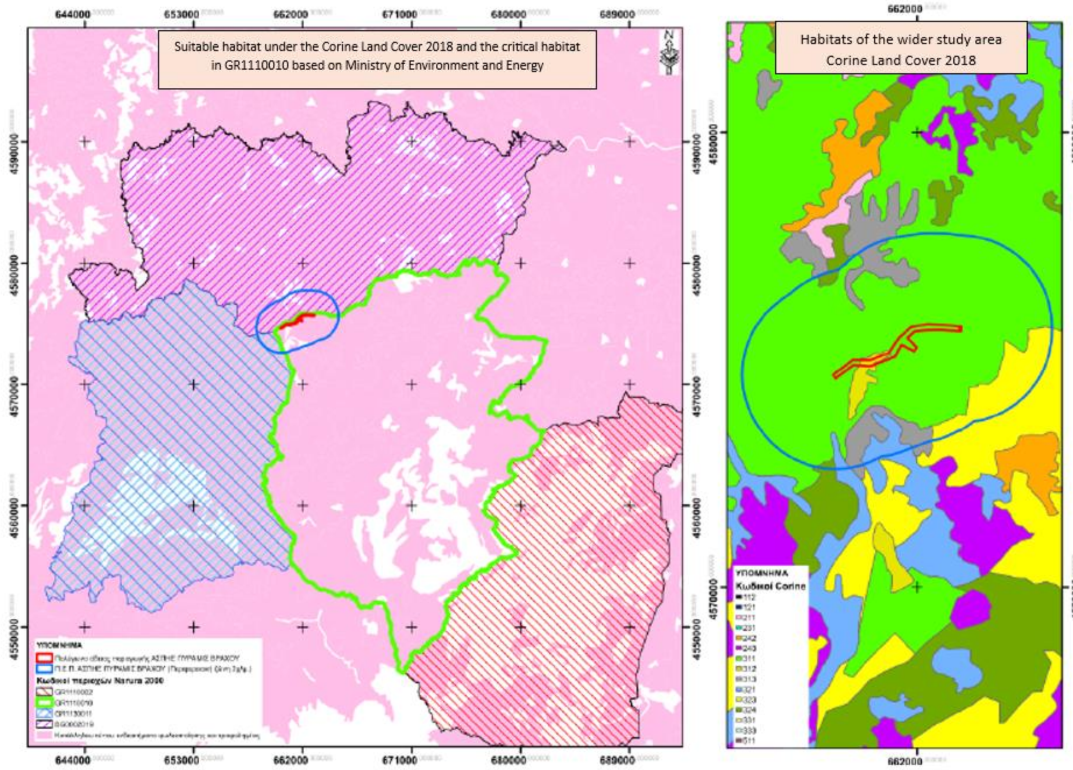
Map 26: *Distribution map of the Black stork (Ciconia nigra) in the broader study area*



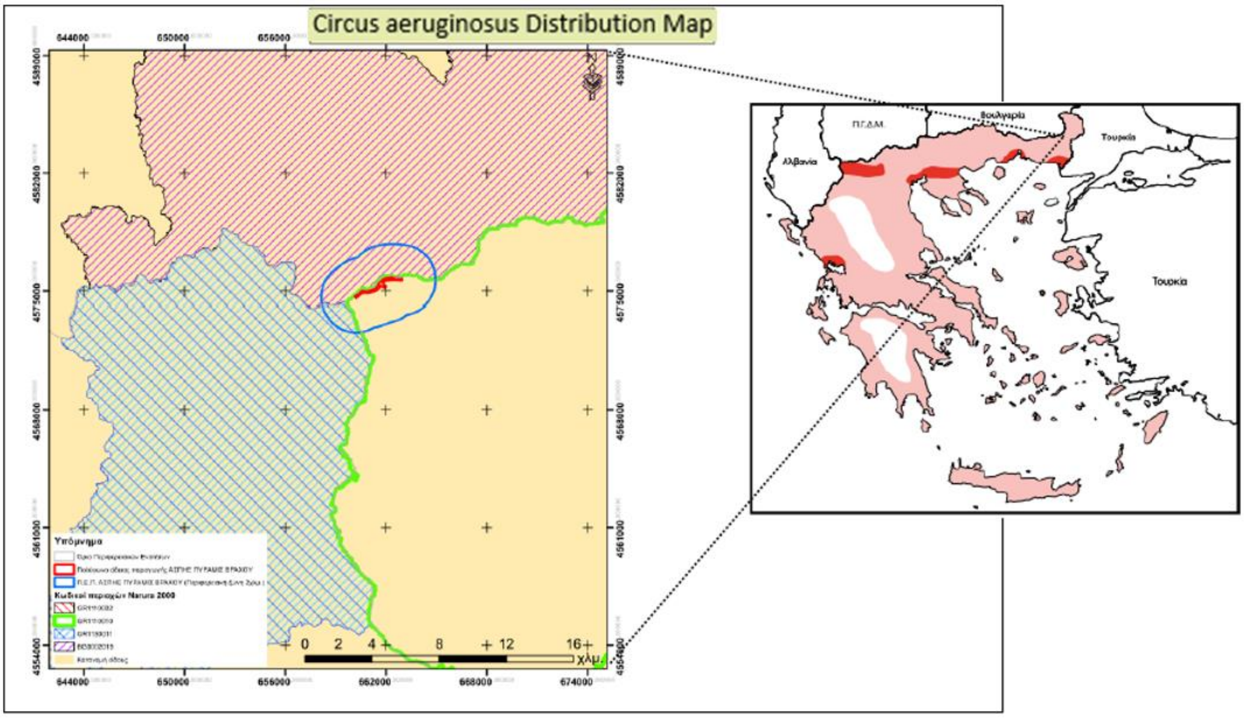
Map 27: *Habitat map of the Black stork (Ciconia nigra) in the broader study area*



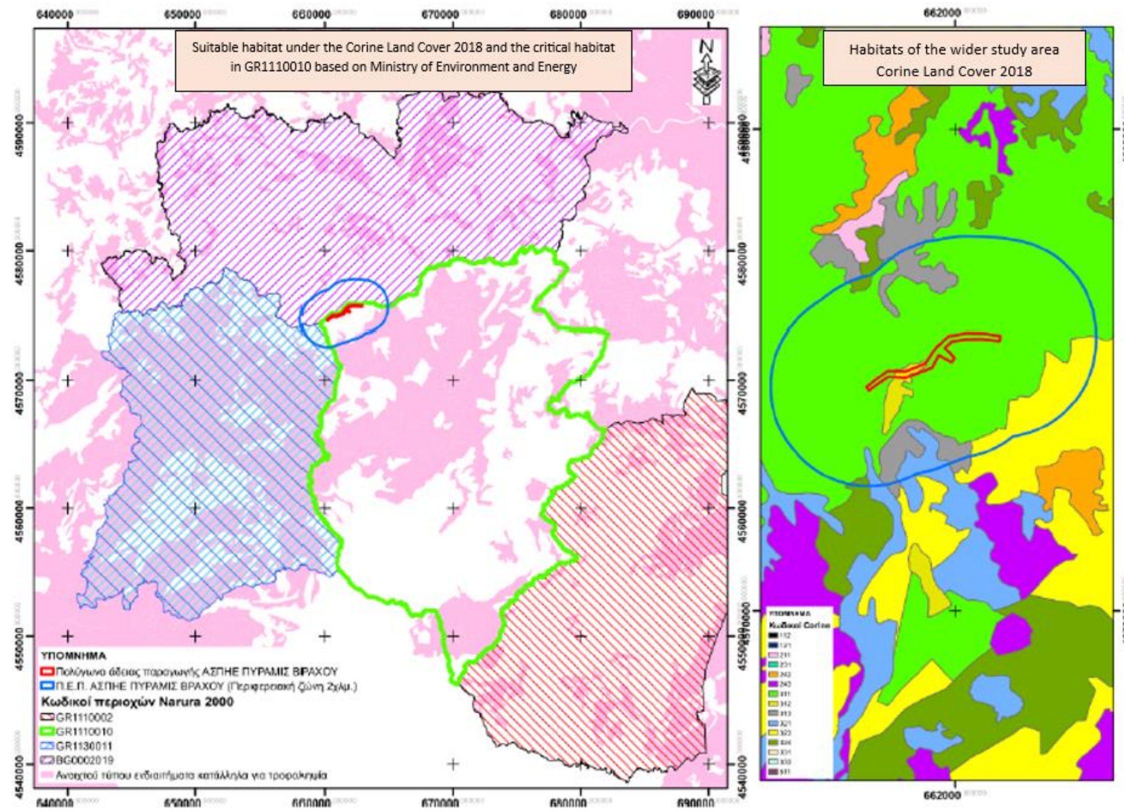
Map 28: *Distribution map of the Accipiter brevipes in the broader study area*



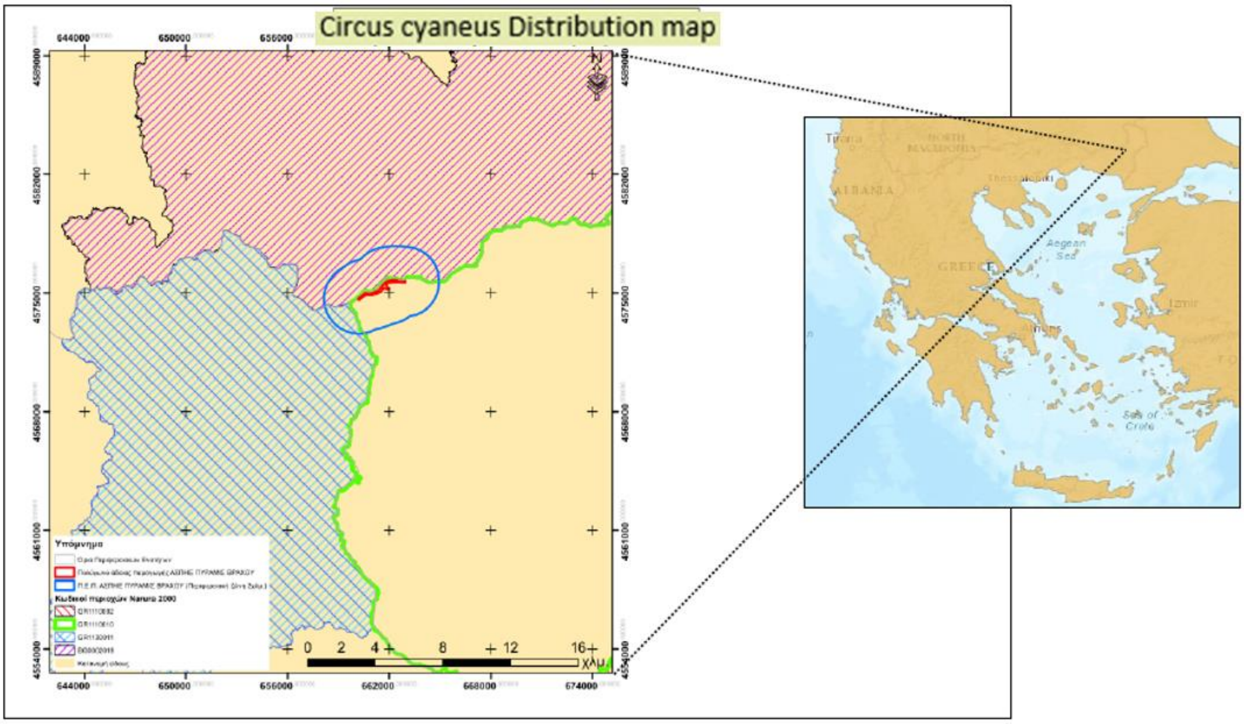
Map 29: *Habitat map of the Accipiter brevipes in the study area*



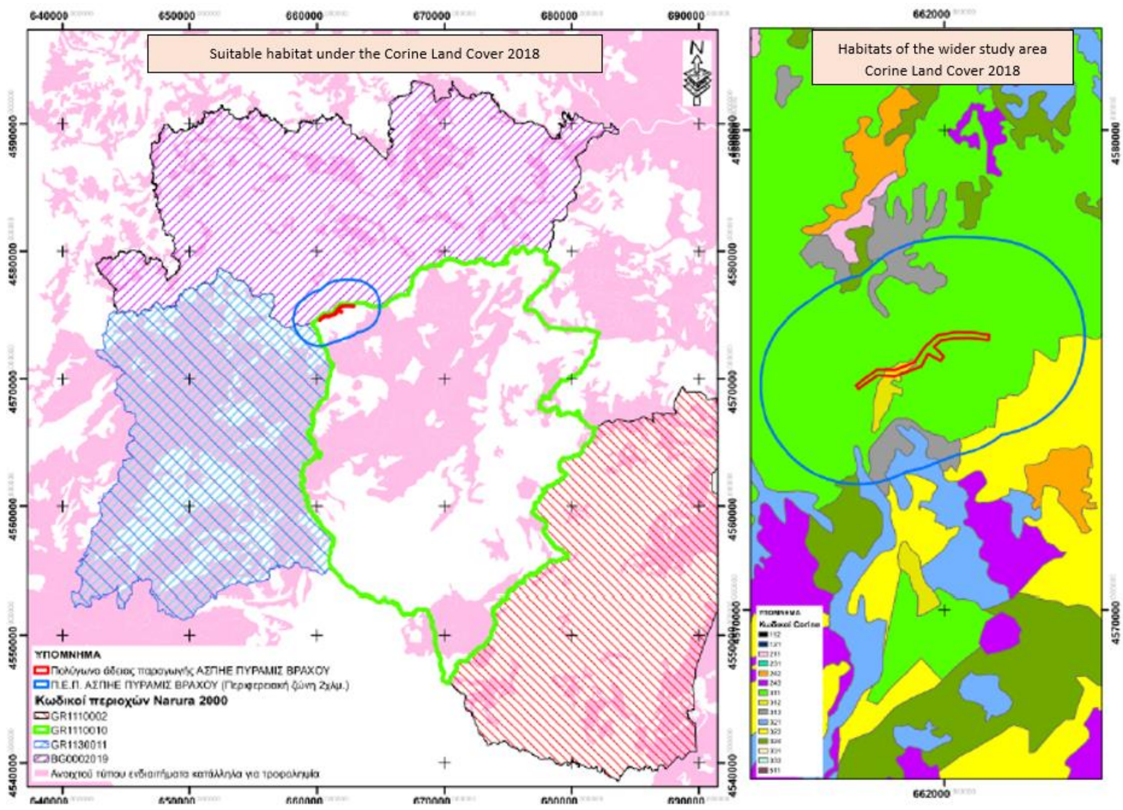
Map 30: *Distribution map of the Circus aeruginosa in the broader study area*



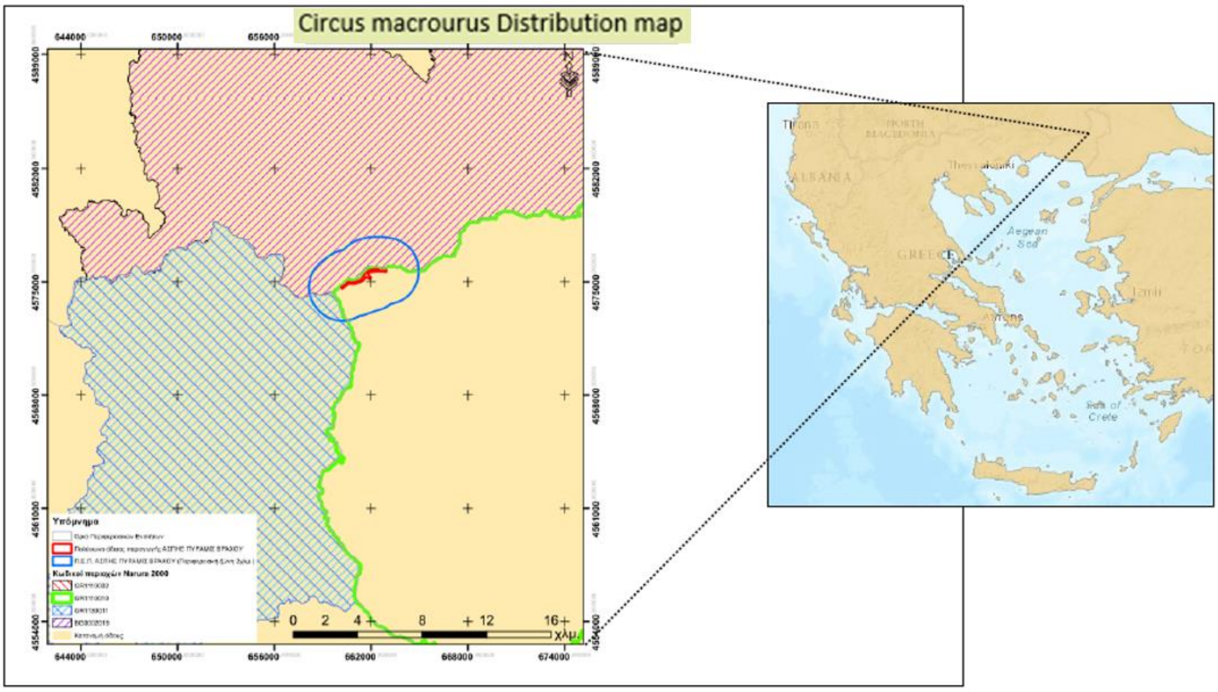
Map 31: *Habitat map of the Circus aeruginosa in the broader study area*



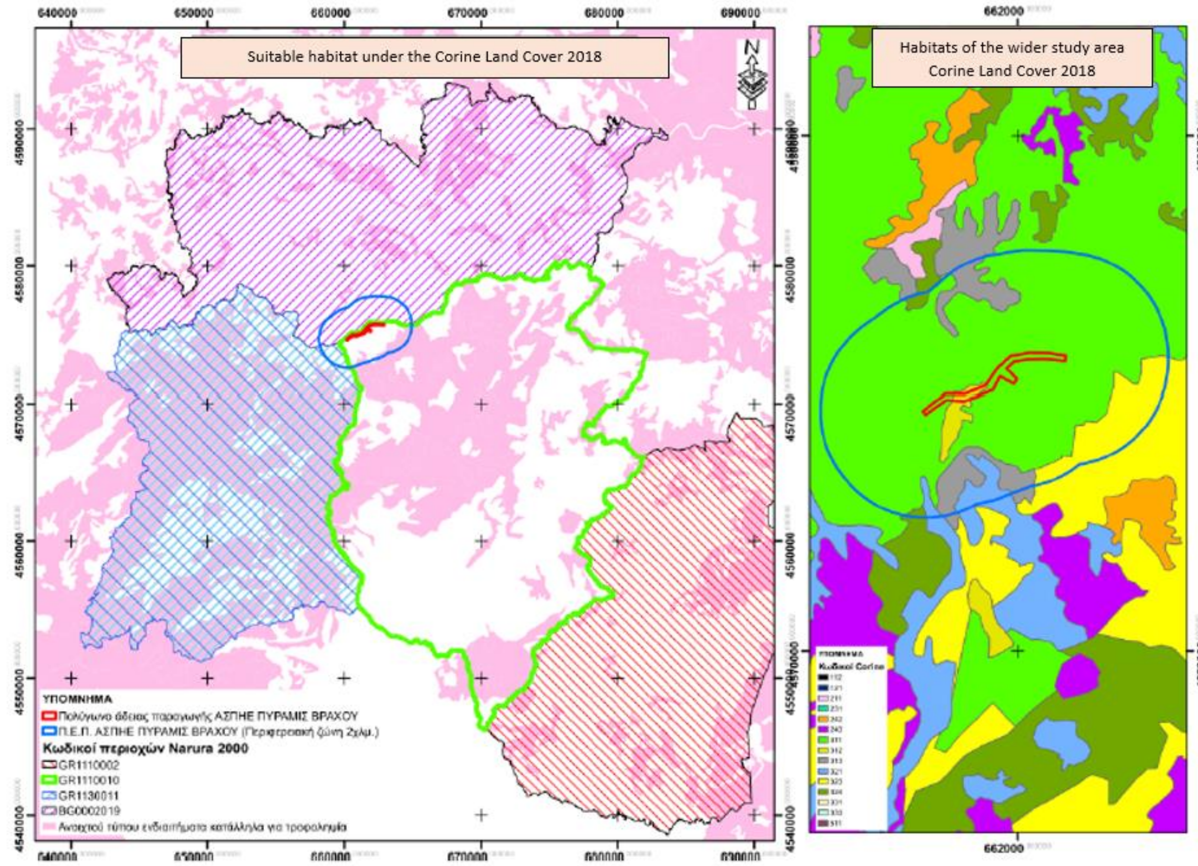
Map 32: *Distribution map of the Circus cyaneus in the broader study area*



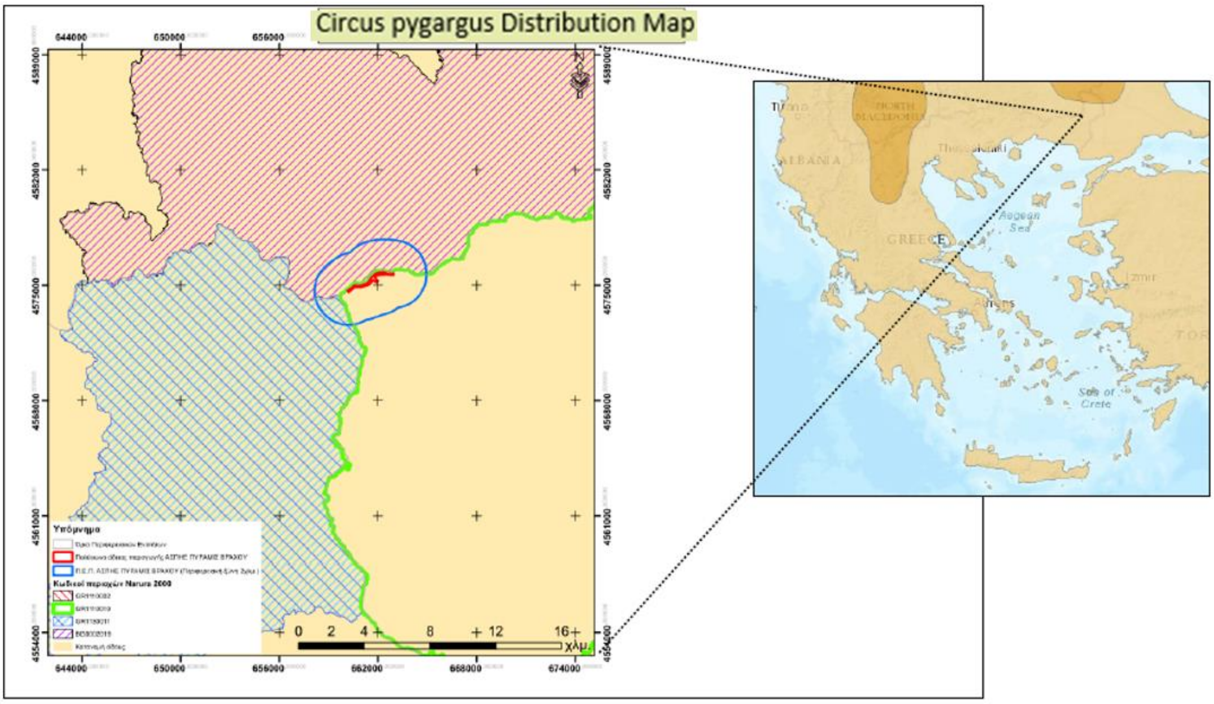
Map 33: *Habitat map of the Circus cyaneus in the broader area*



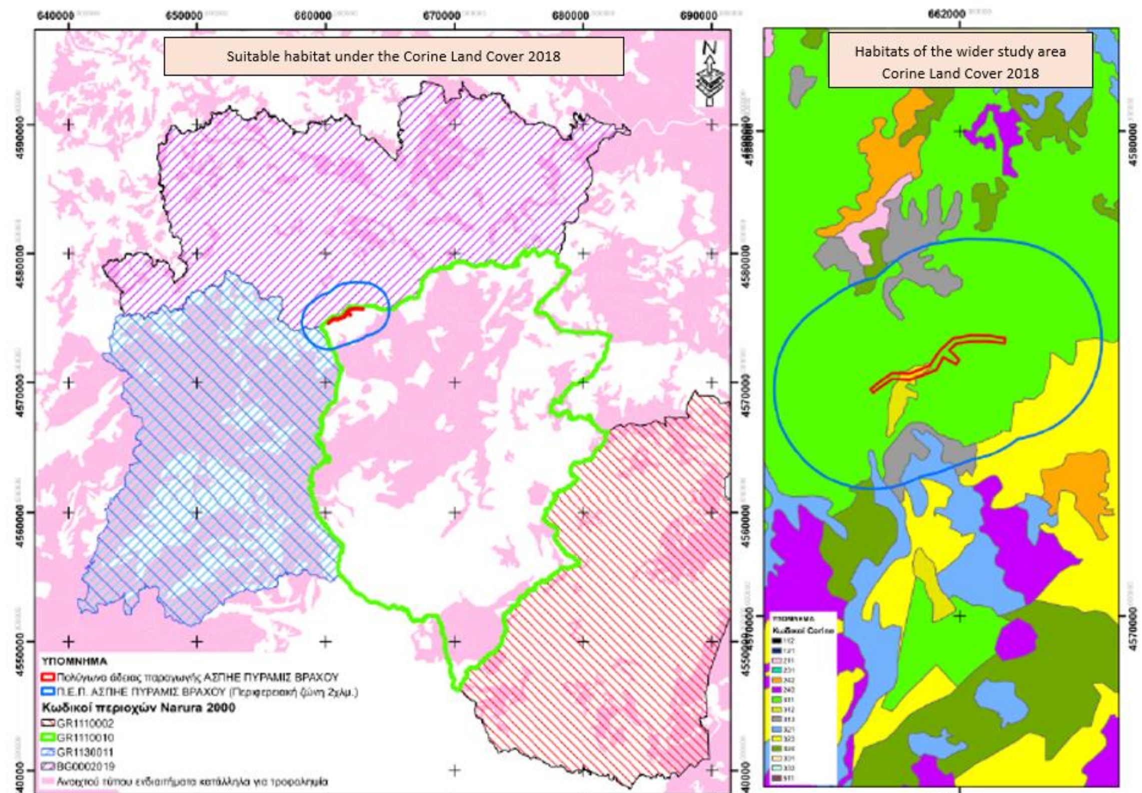
***Map 34**: Distribution map of the Circus macrourus in the broader study area*



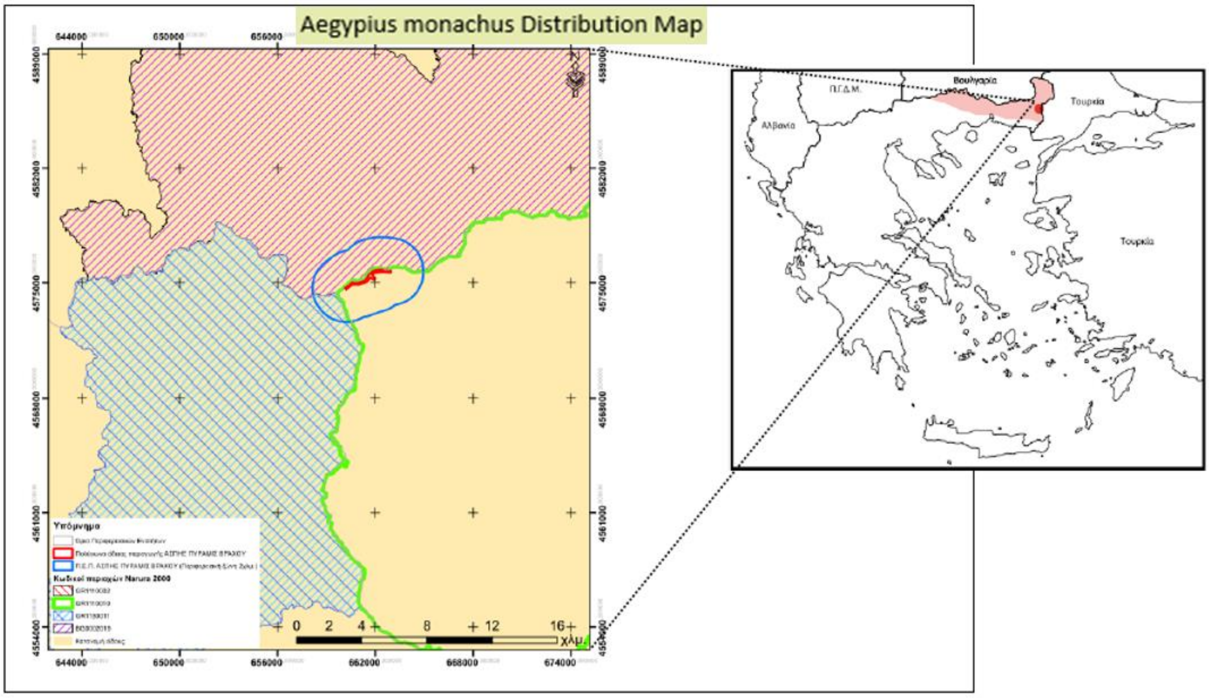
***Map 35**: Habitat map of the Circus macrourus in the broader study area*



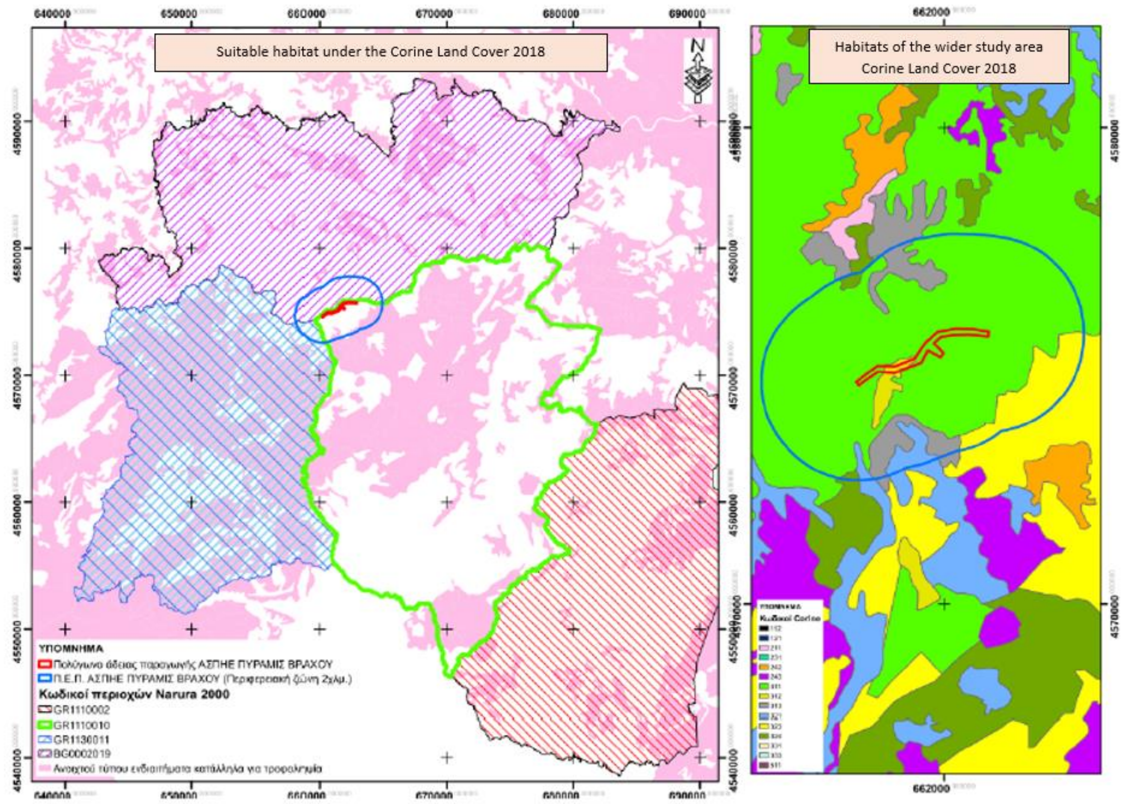
Map 36: *Distribution map of the Circus pygargus in the broader study area*



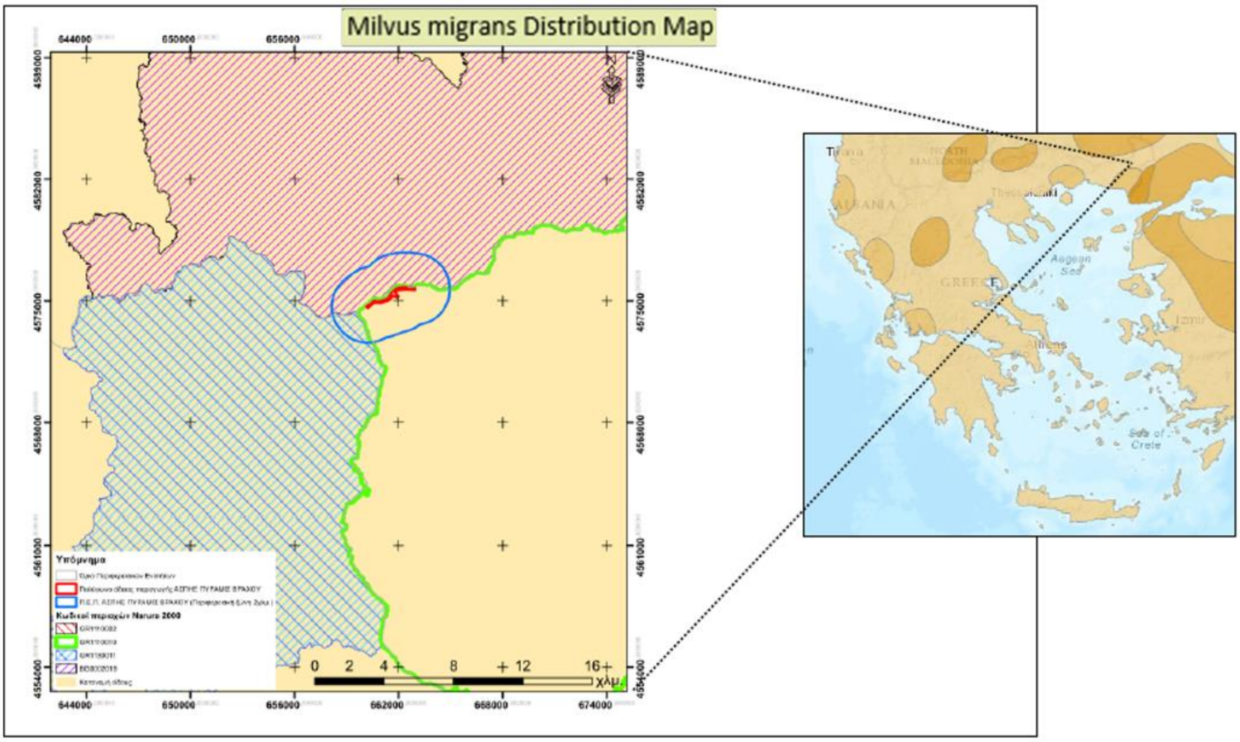
Map 37: *Habitat map of the Circus pygargus in the broader study area*



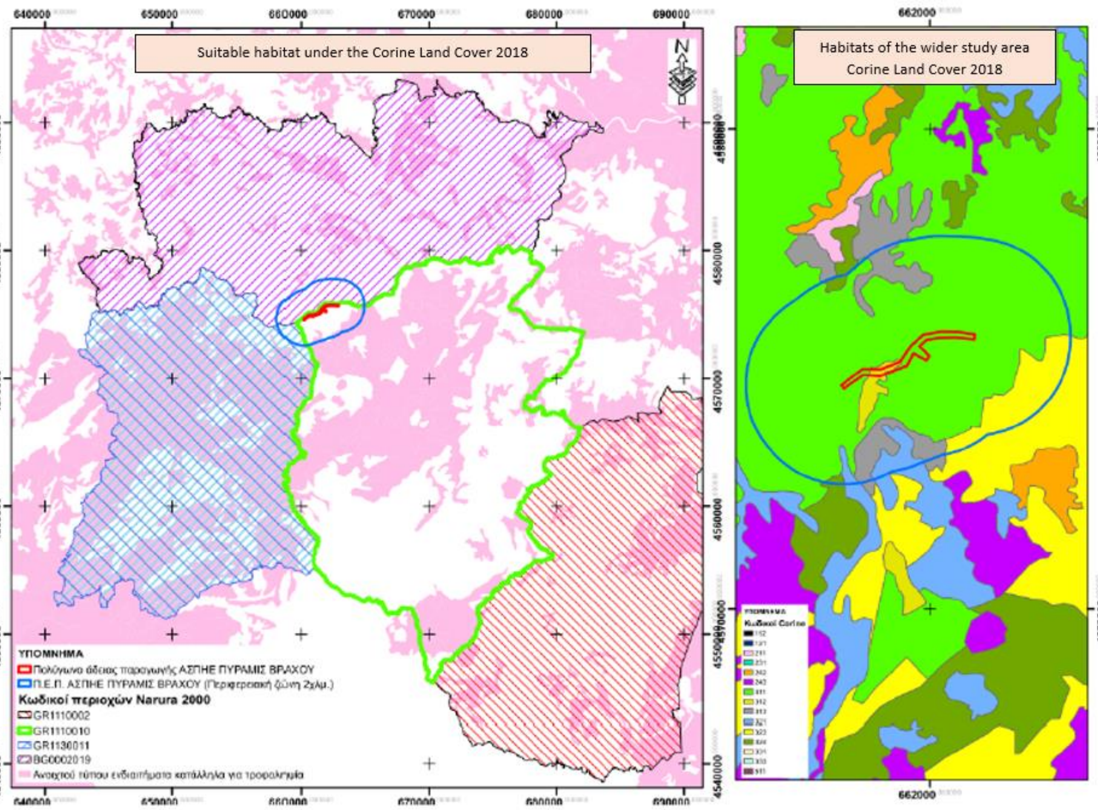
Map 38: *Distribution map of the Aegypius monachus in the broader study area*



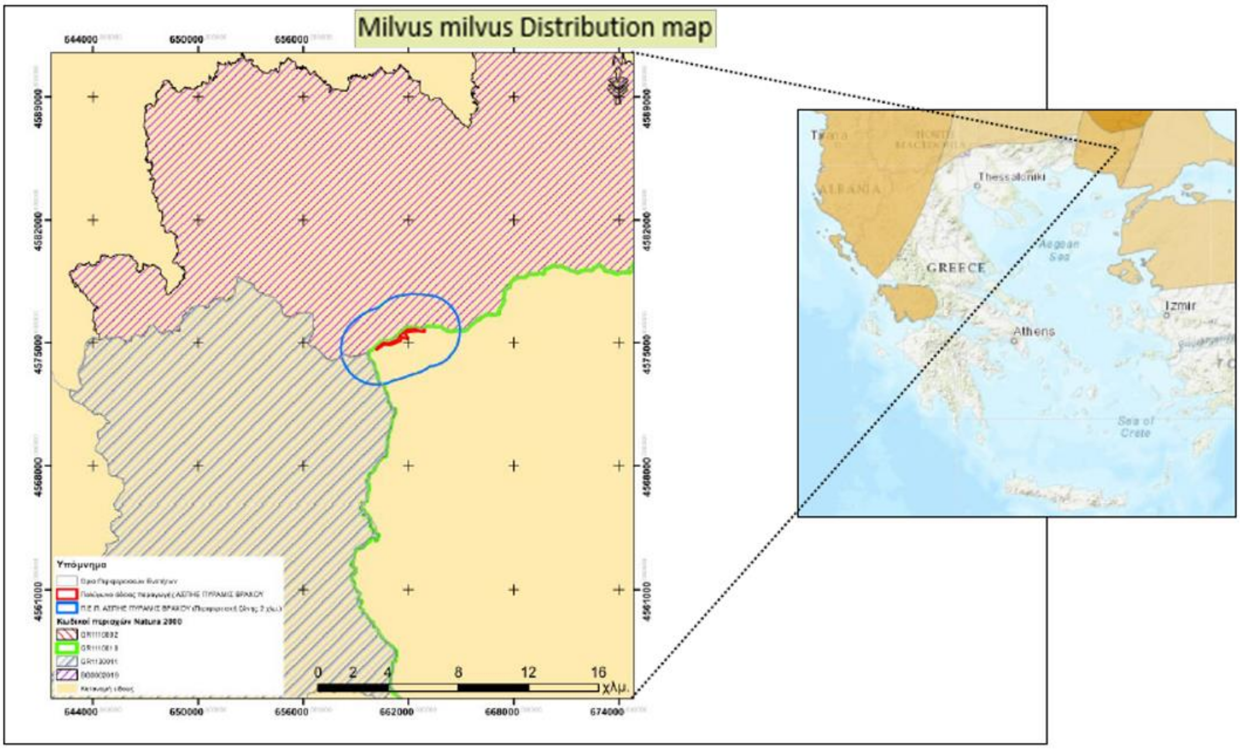
Map 39: *Habitat map of the Aegypius monachus in the broader study area*



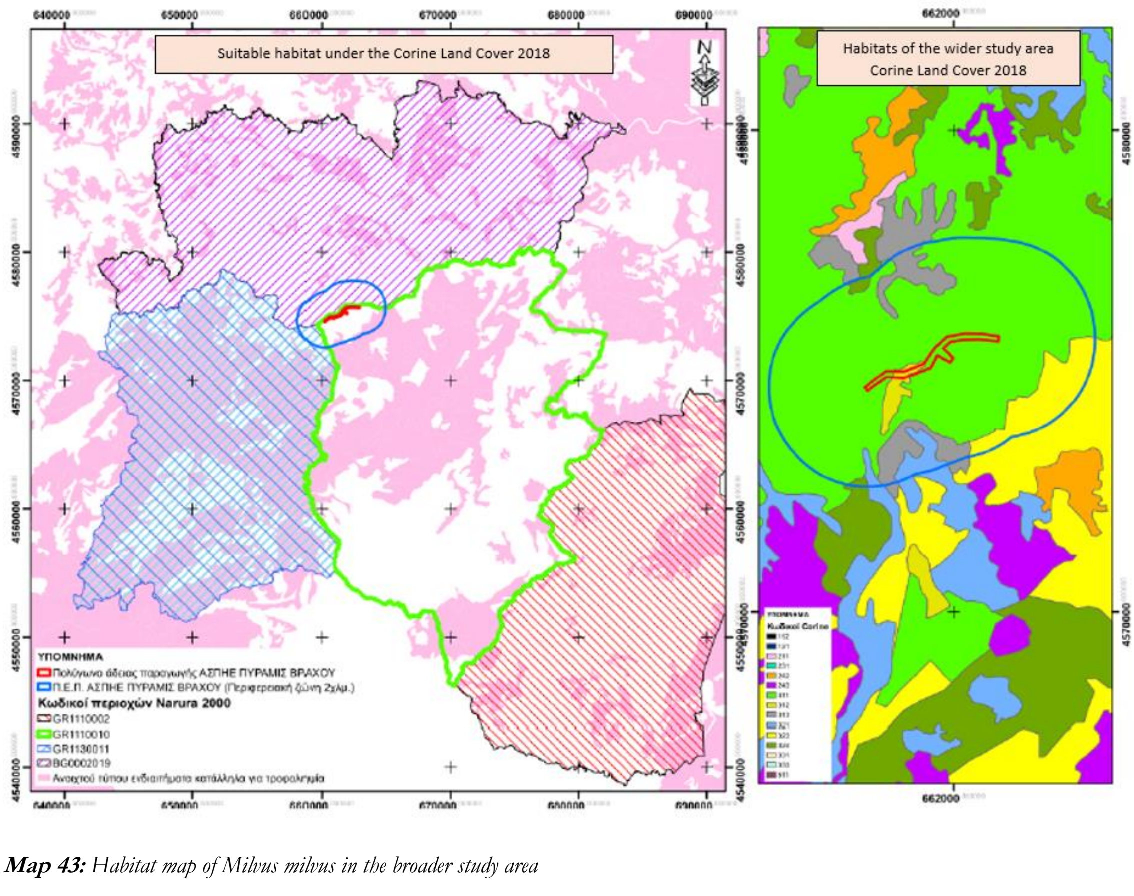
Map 40: *Distribution map of the Milvus migrans in the broader study area*



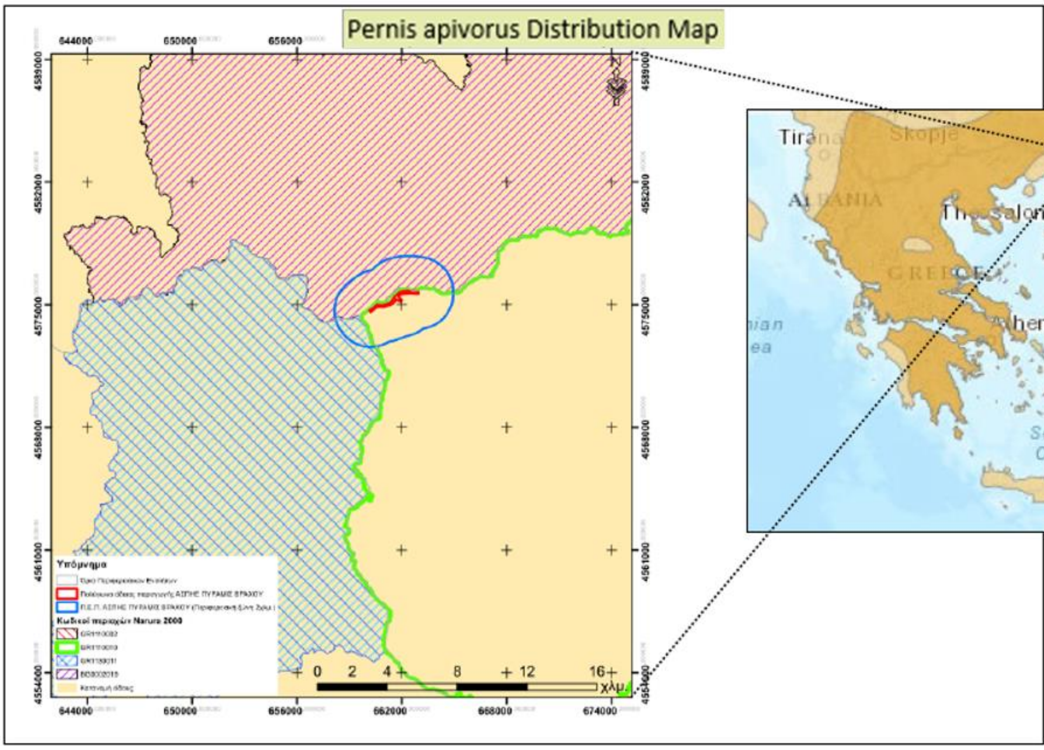
Map 41: *Habitat map of the Milvus migrans in the broader study area*



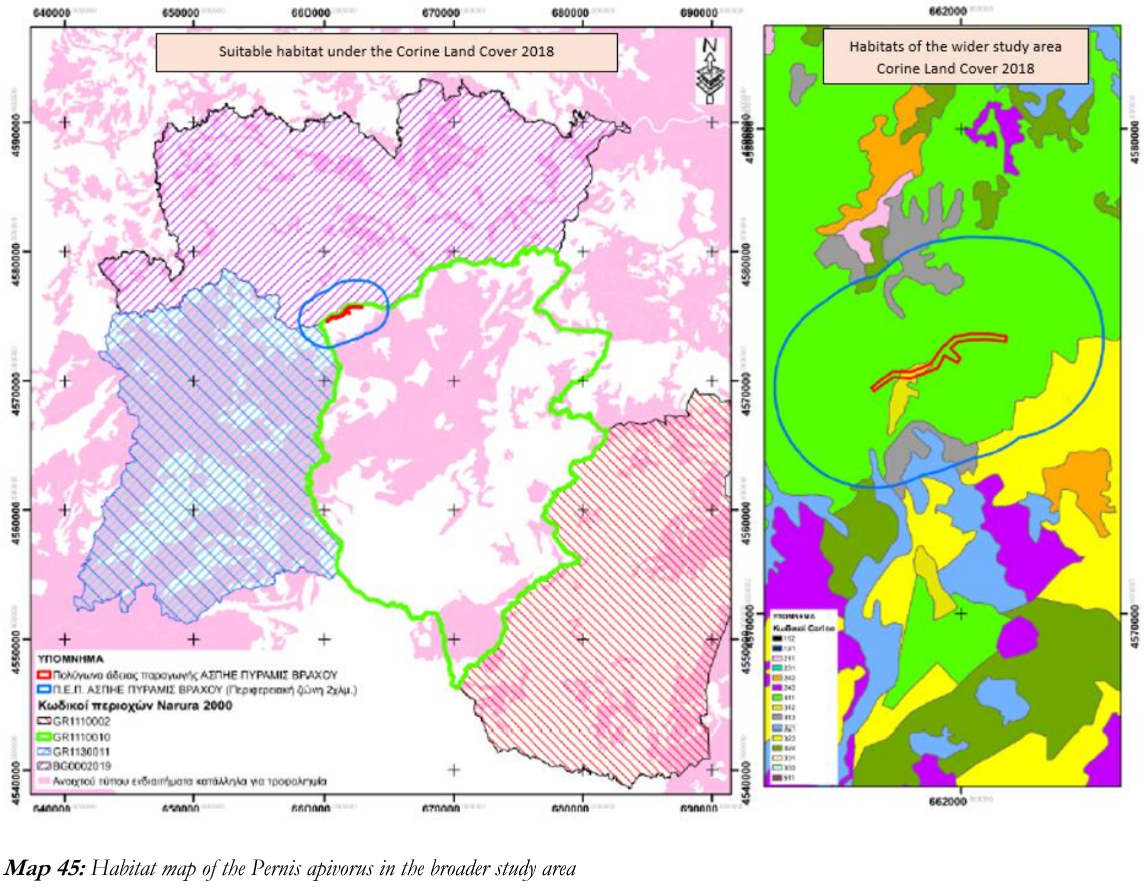
Map 42: *Distribution map of Milvus milvus in the broader study area*



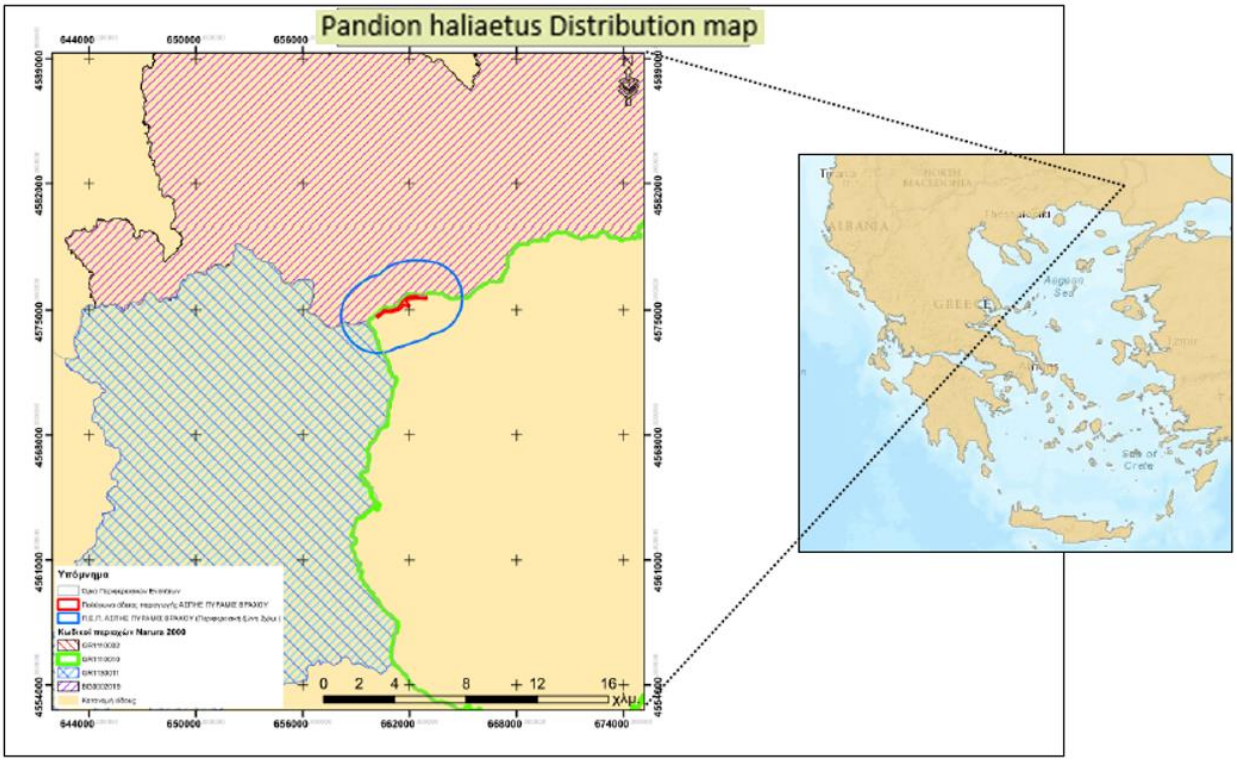
Map 43: *Habitat map of Milvus milvus in the broader study area*



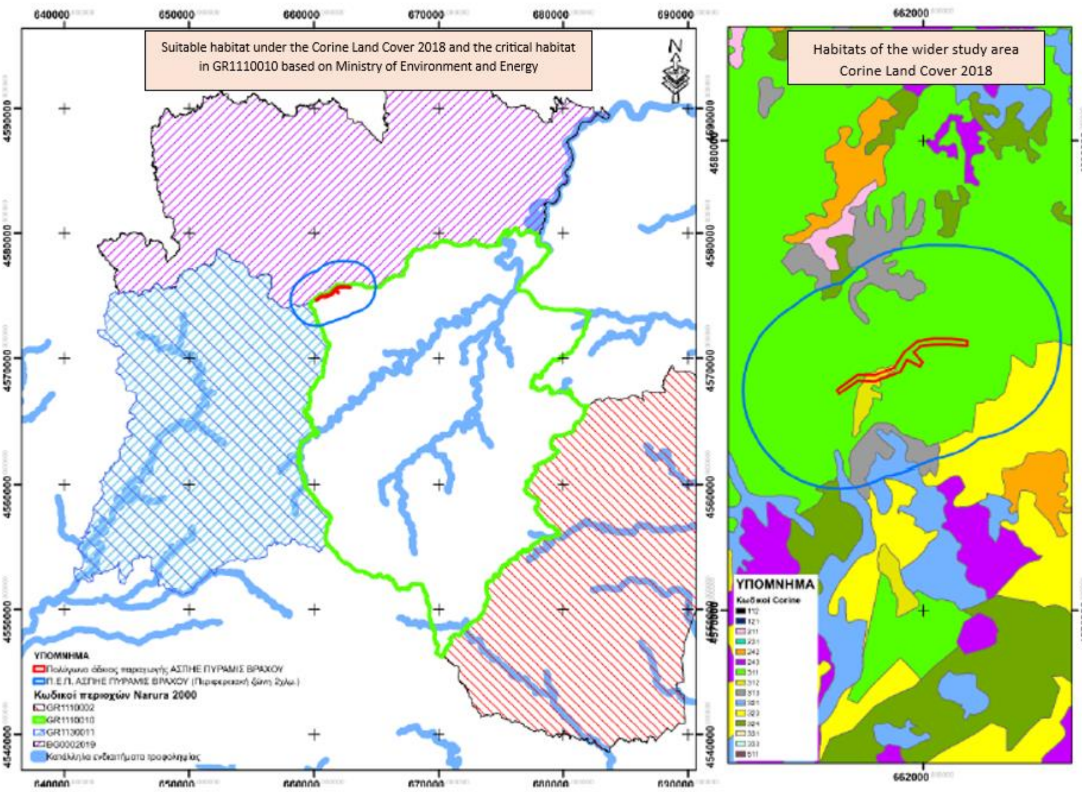
Map 44: *Distribution map of the Pernis apivorus in the broader study area*



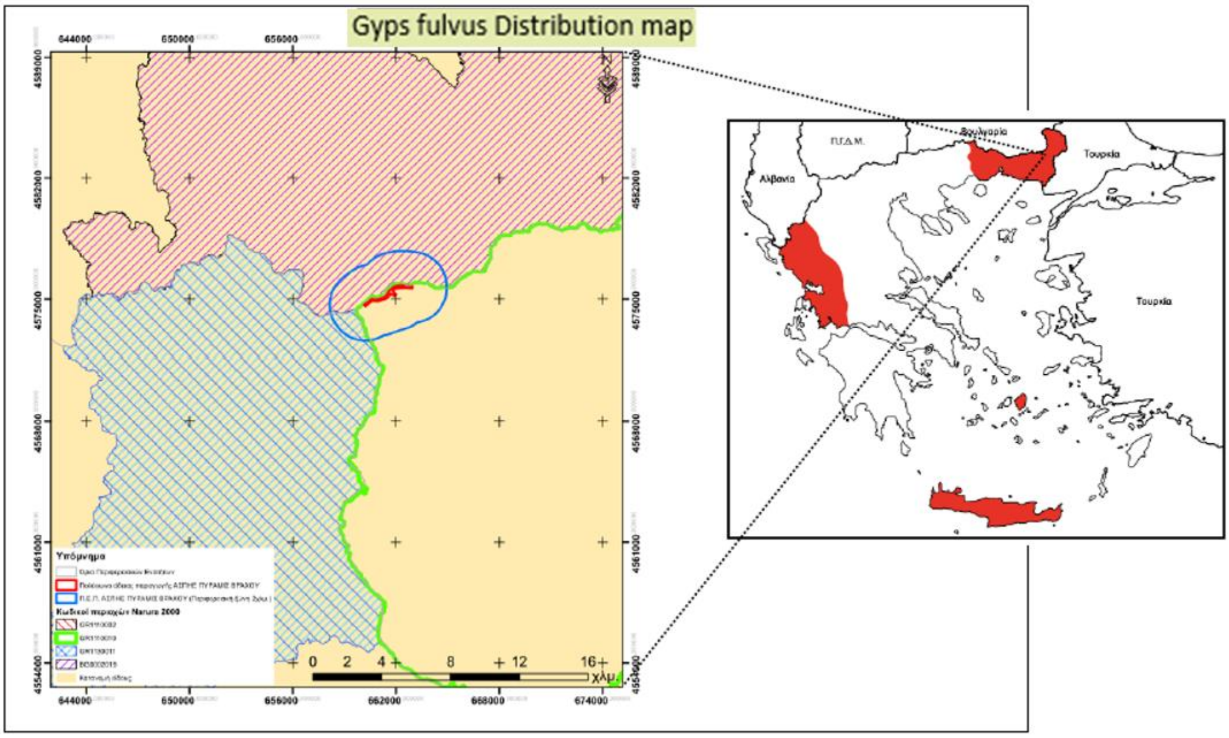
Map 45: *Habitat map of the Pernis apivorus in the broader study area*



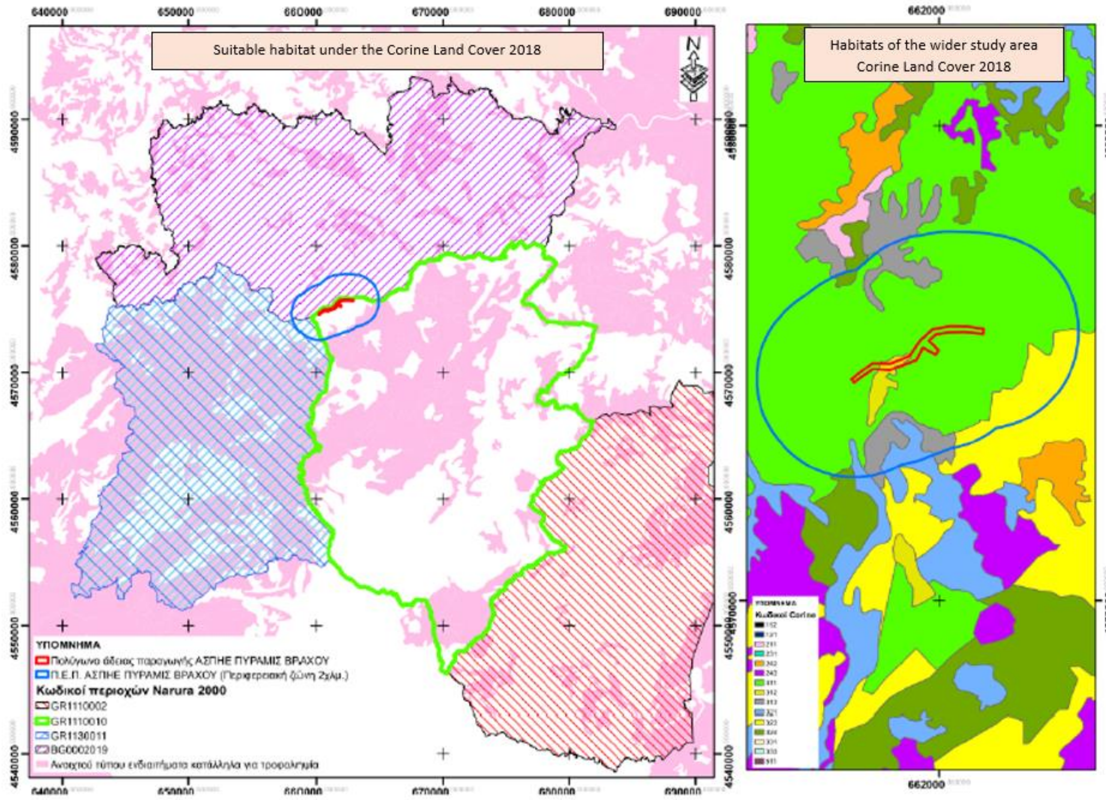
Map 46: *Distribution map of the Pandion haliaetus in the broader study area*



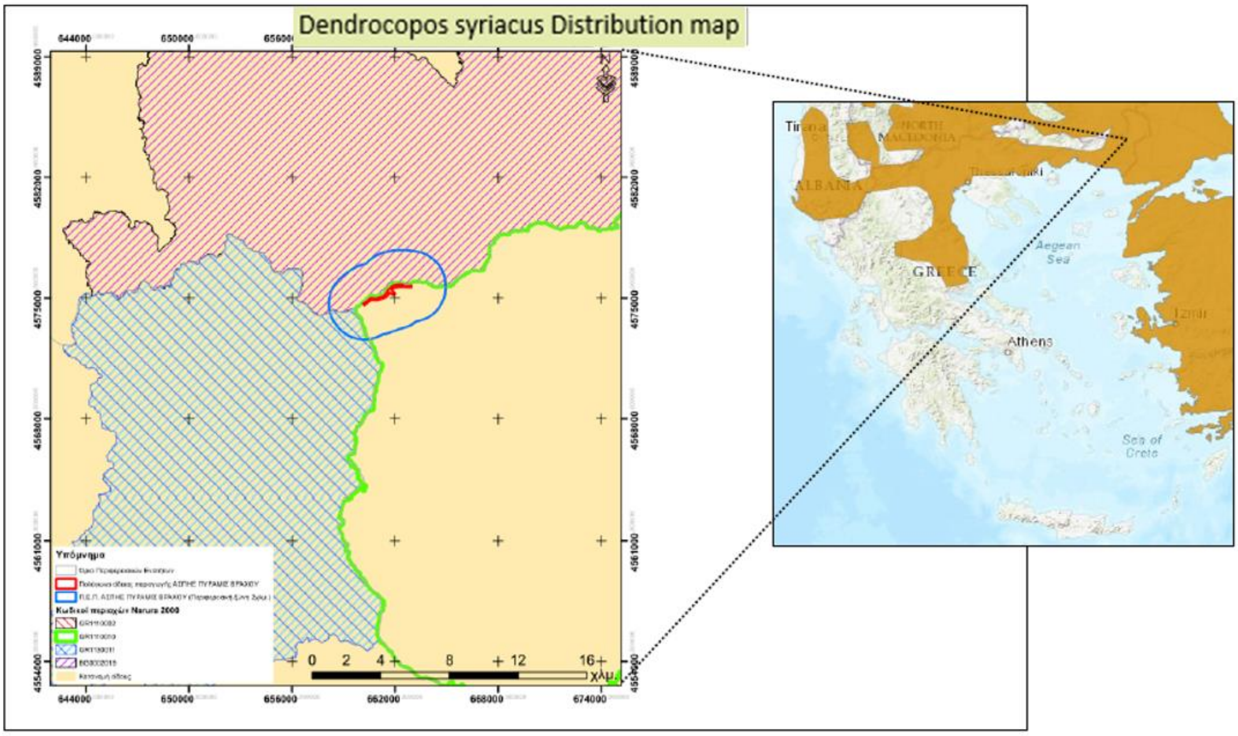
Map 47: *Habitat map of the Pandion haliaetus in the broader study area*



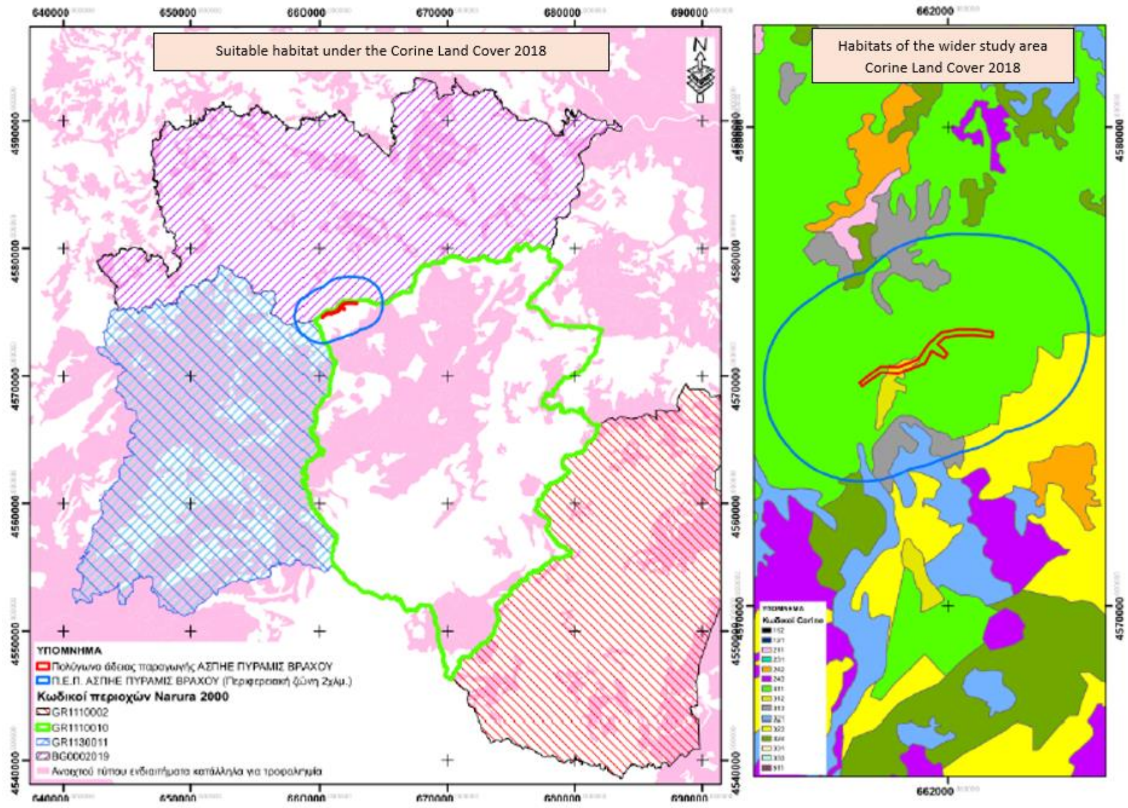
Map 48: *Distribution map of Gyps fulvus in the broader study area*



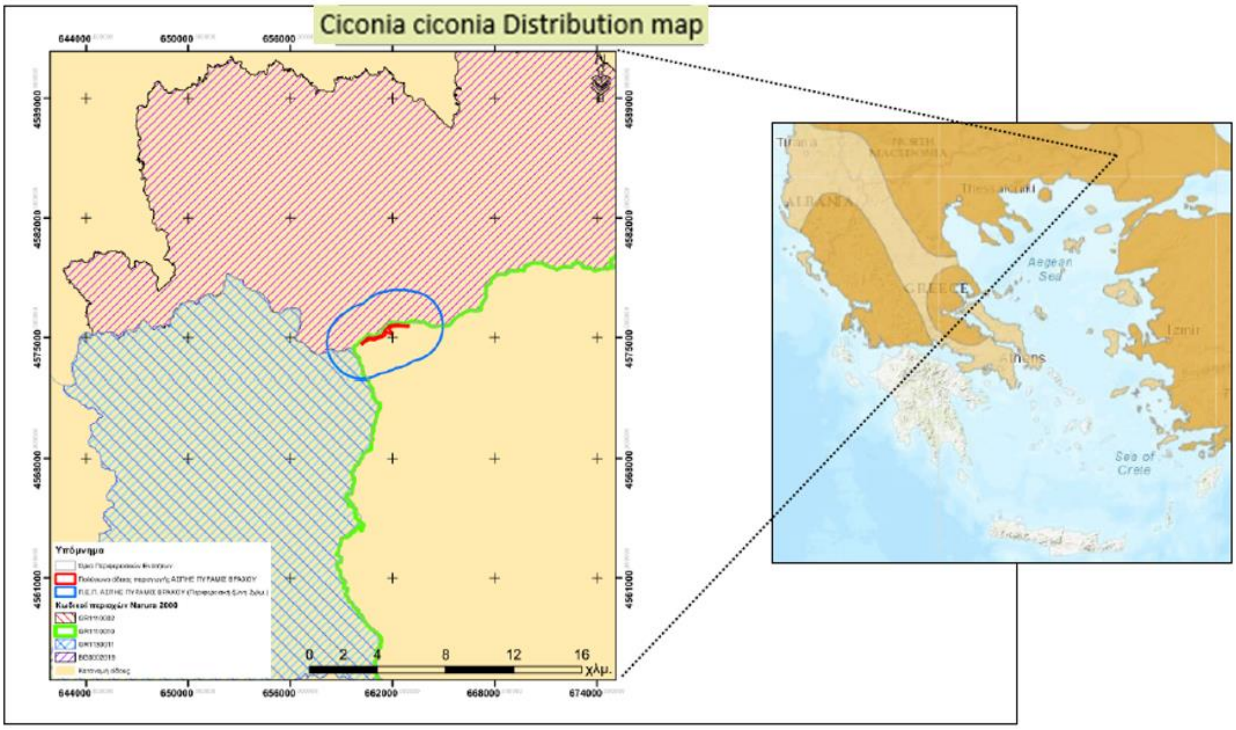
Map 49: *Habitat map of the Gyps fulvus in the broader study area*



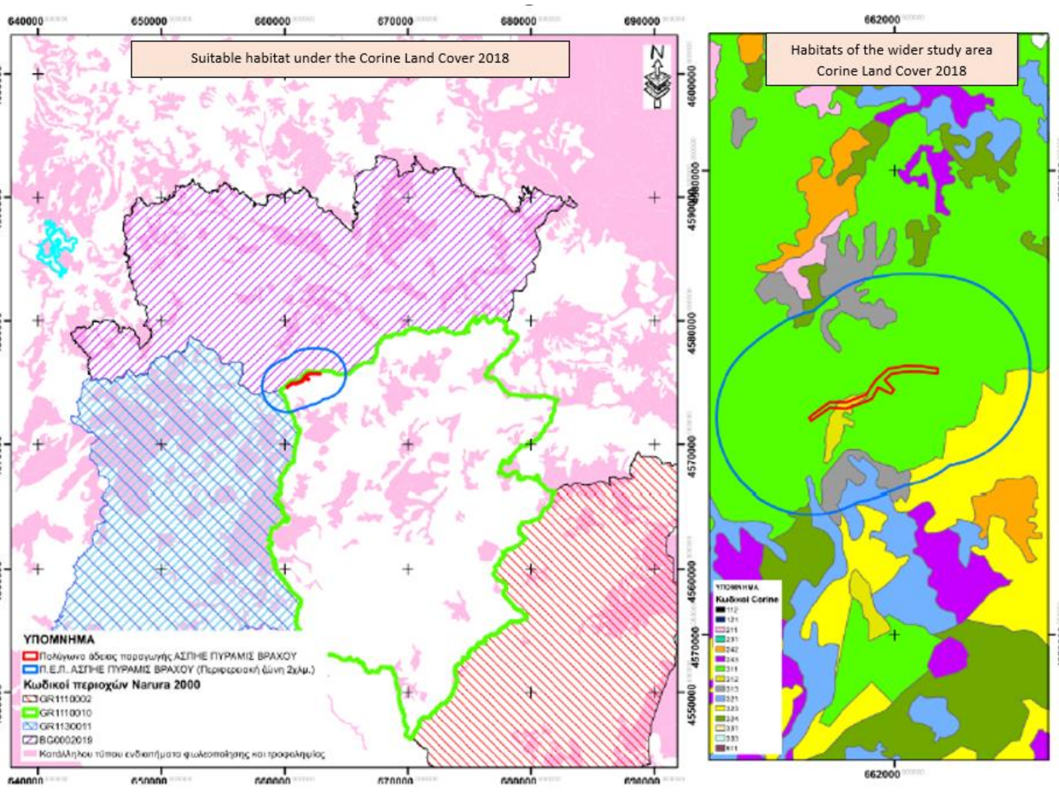
Map 50: *Distribution map of the Dendrocopos syriacus in the broader study area*



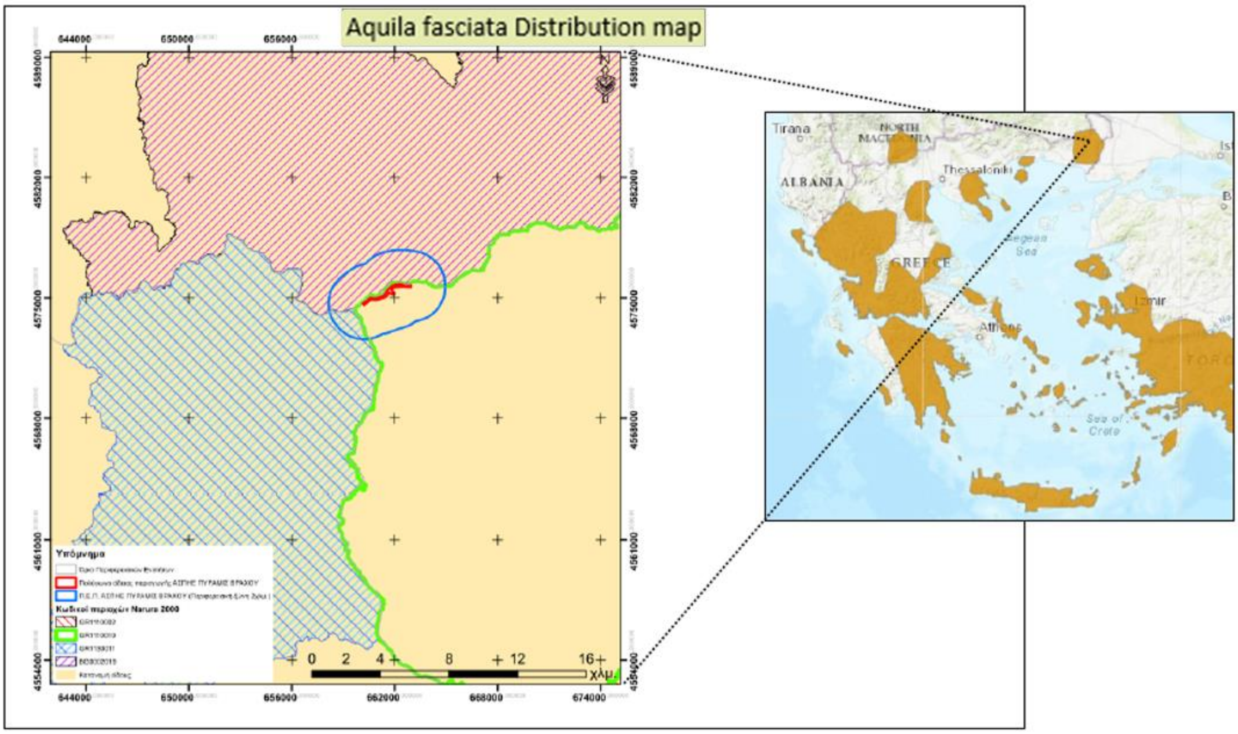
Map 51: *Habitat map of the Dendrocopos syriacus in the broader study area*



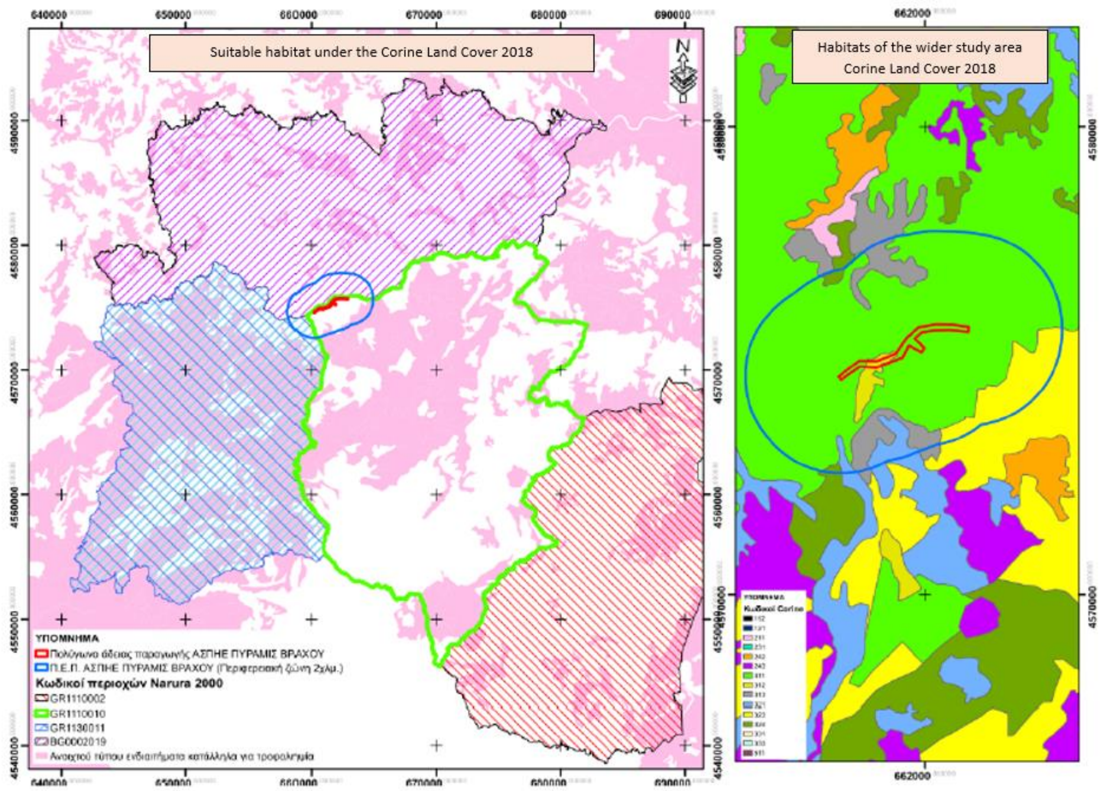
Map 52: *Distribution map of the Ciconia ciconia in the broader study area*



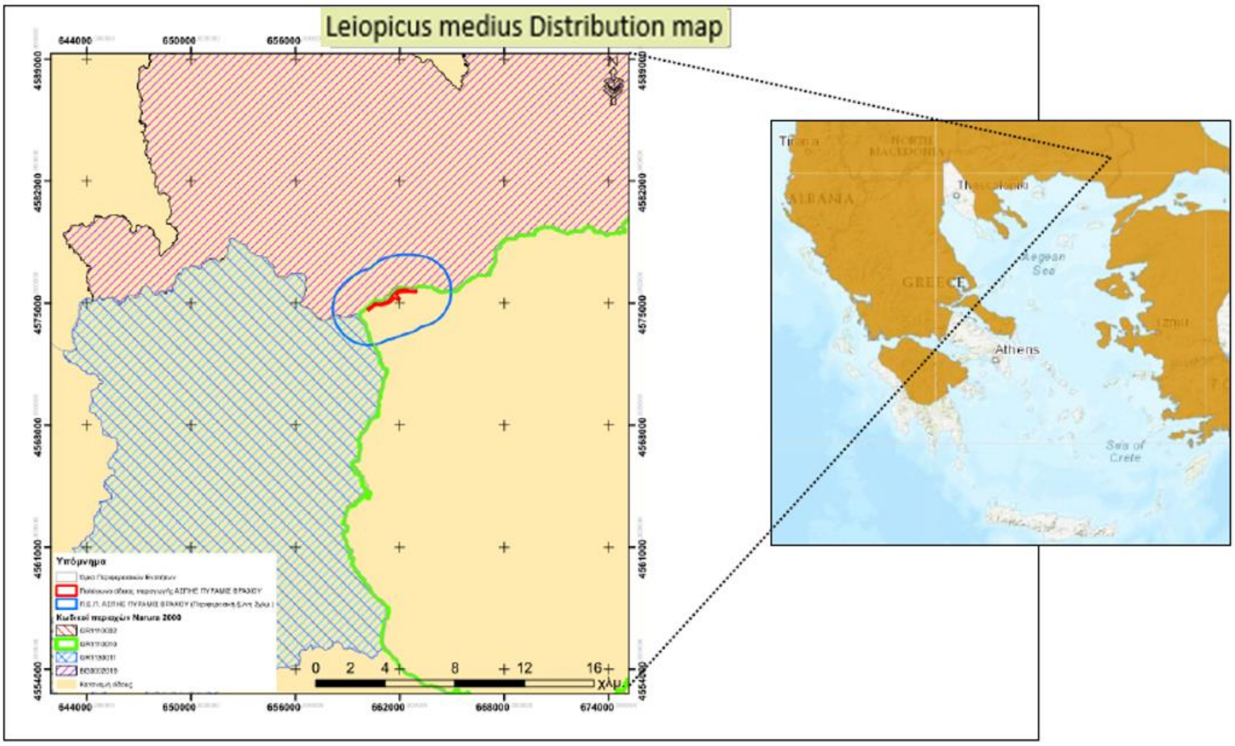
Map 53: *Habitat map of the Ciconia ciconia in the broader study area*



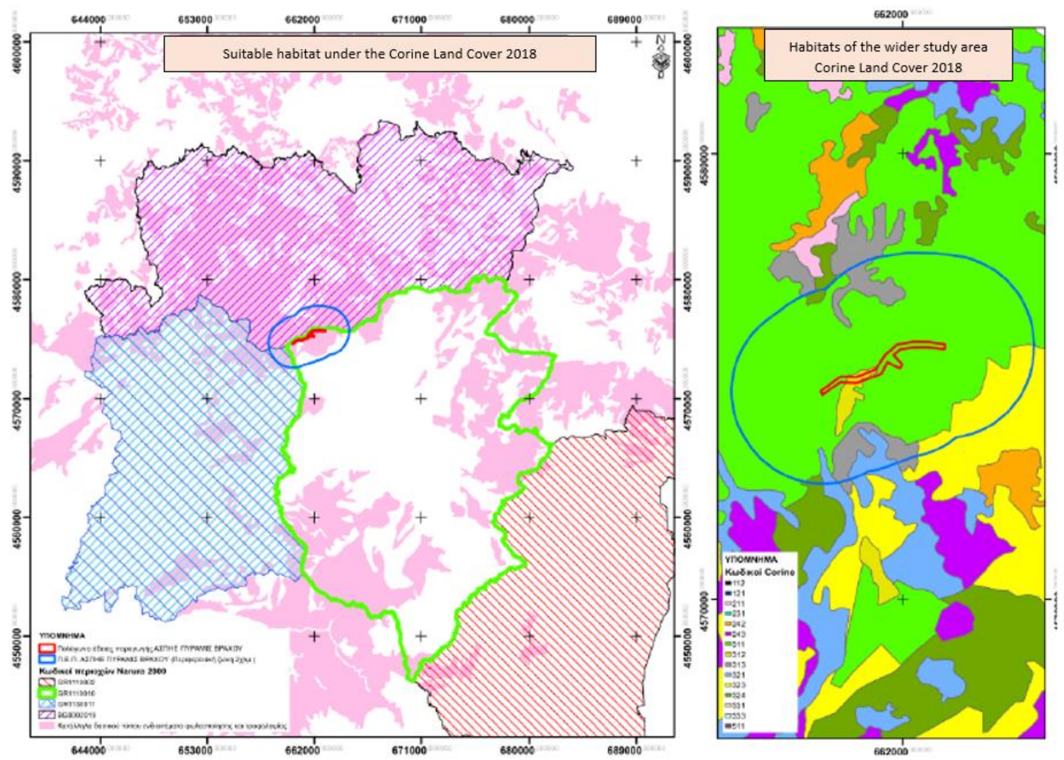
***Map 54**: Distribution map of the Aquila fasciata in the broader study area*



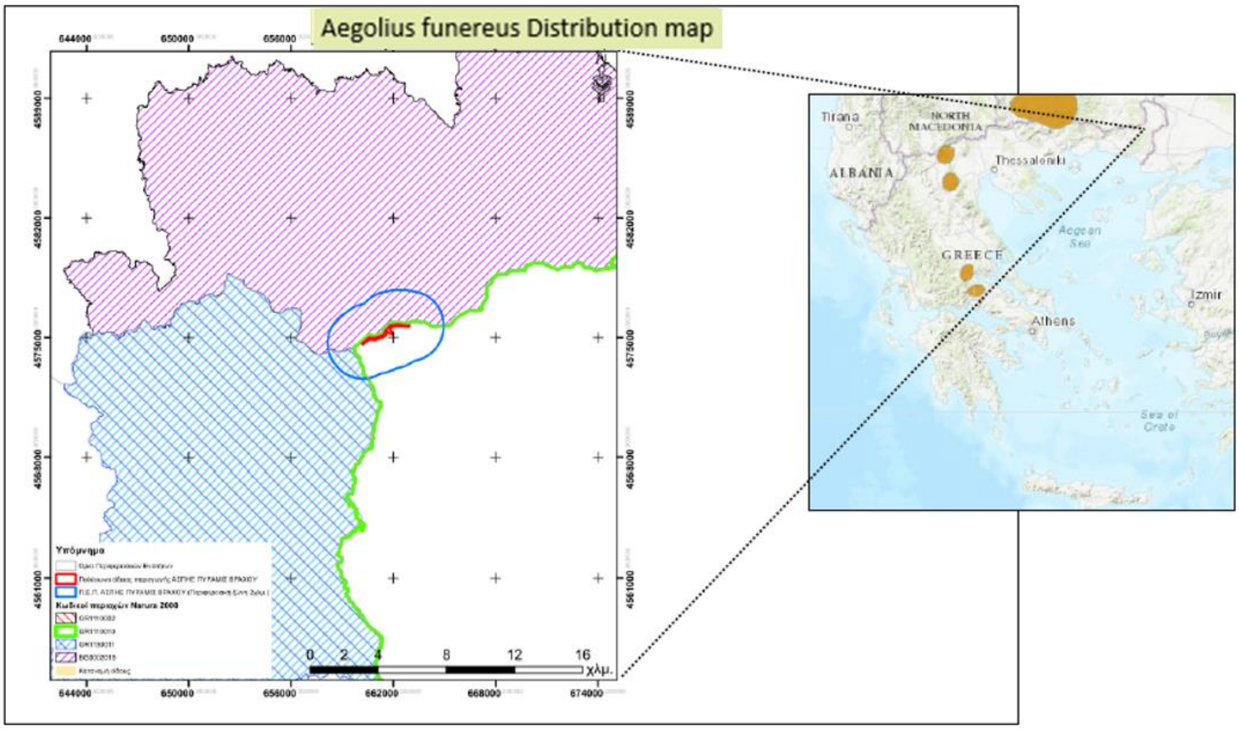
***Map 55:** Habitat map of the Aquila fasciata in the broader study area*



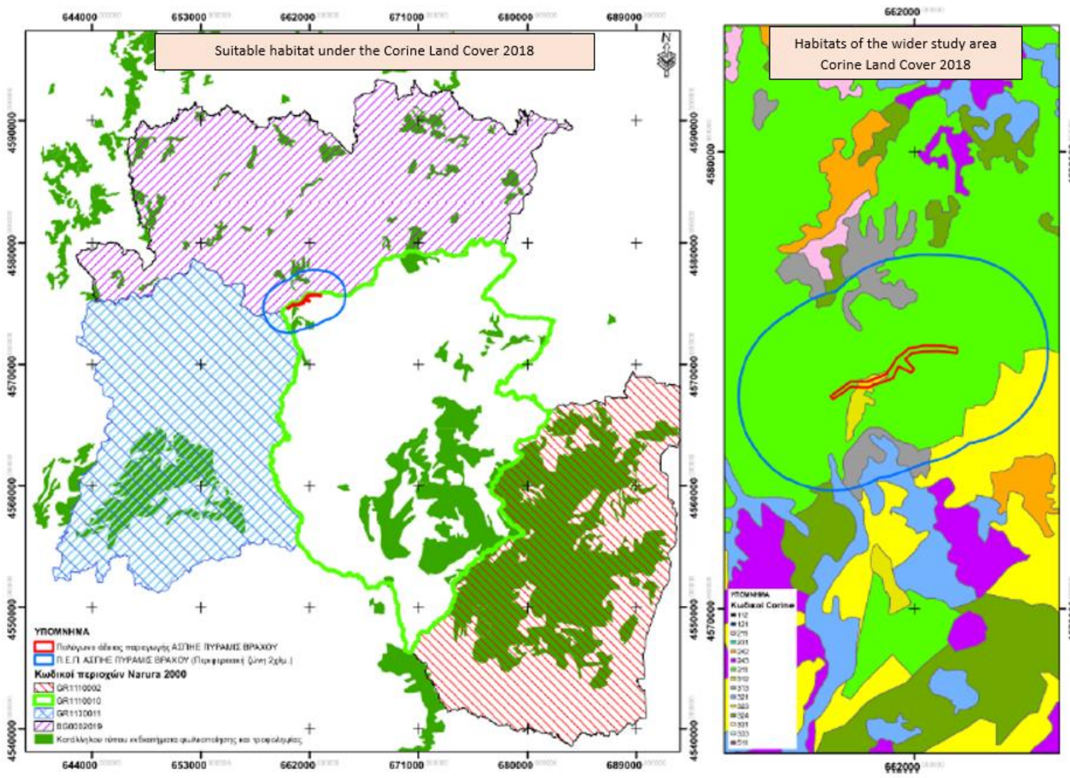
Map 56: *Distribution map of Leiopicus medius in the broader study area*



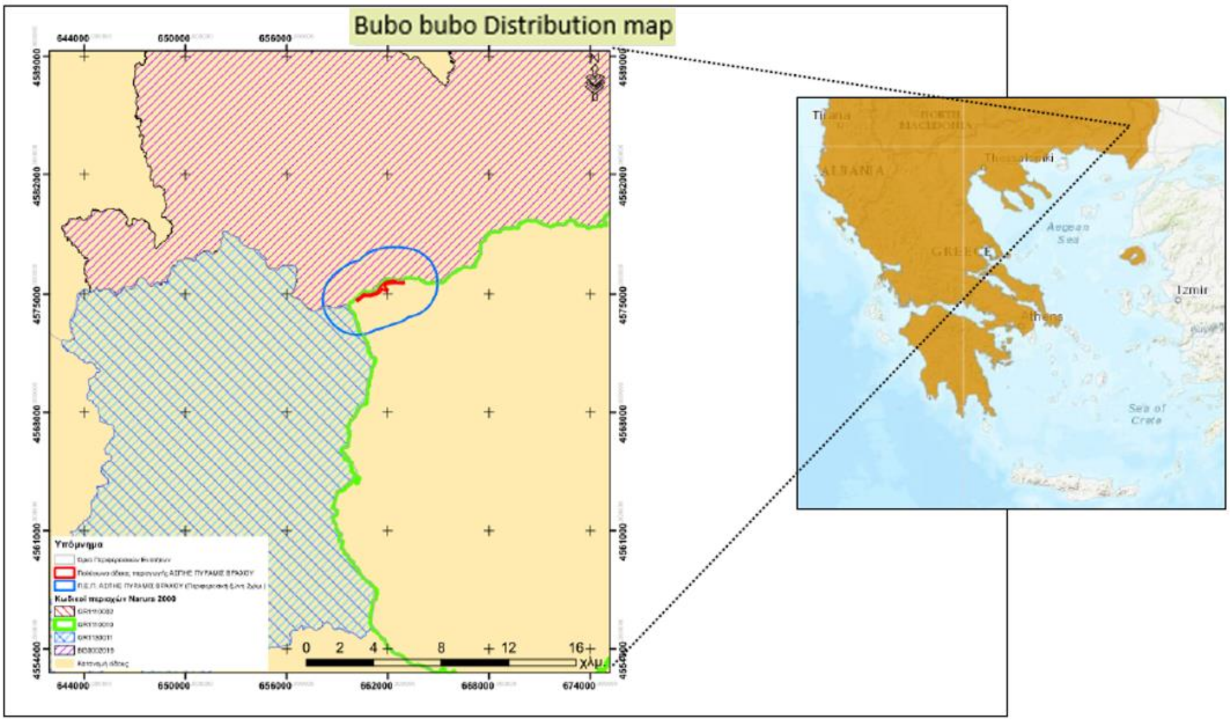
Map 57: *Habitat map of the Leiopicus medius in the broader study area*



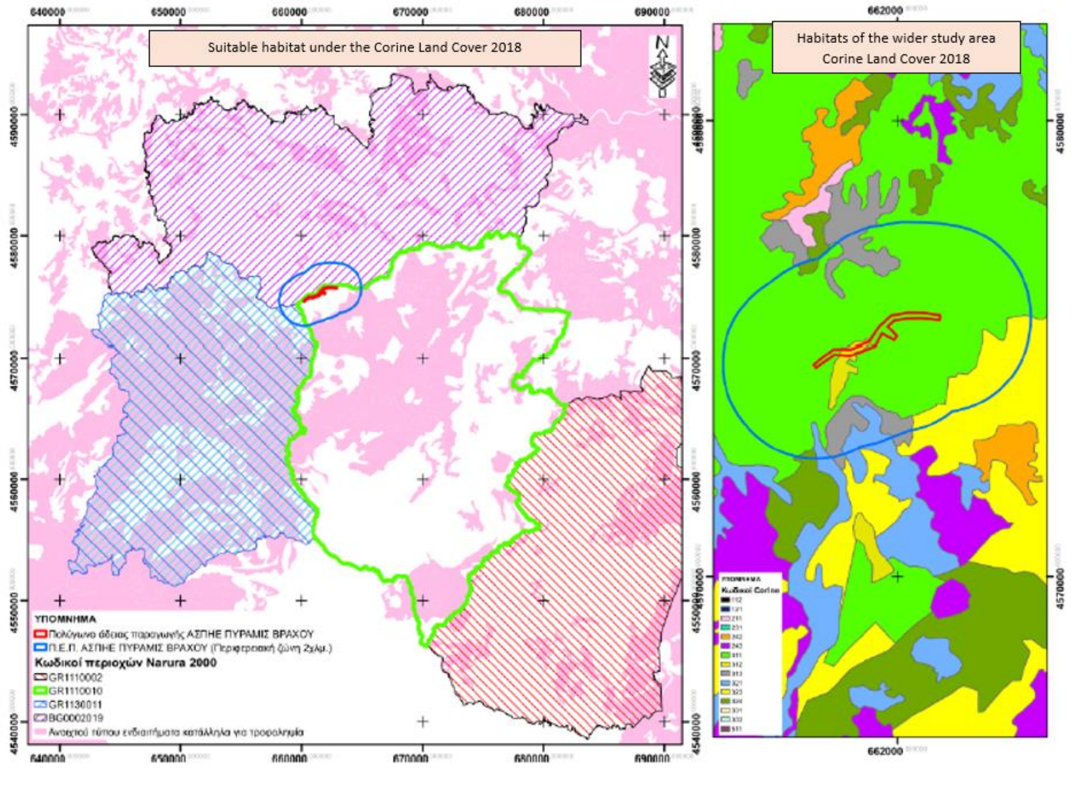
__Map 58:__ Distribution map of the Aegolius funereus in the broader study area



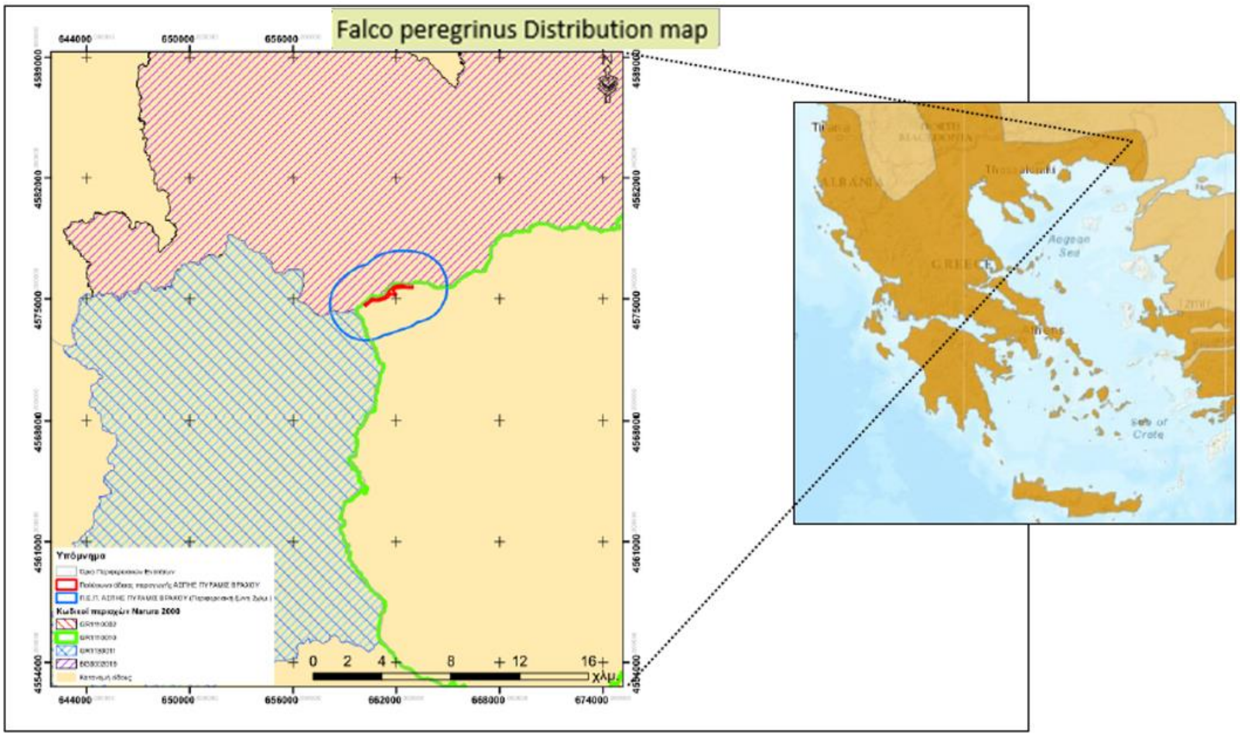
__Map 59:__ Habitat map of Aegolius funereus in the broader study area



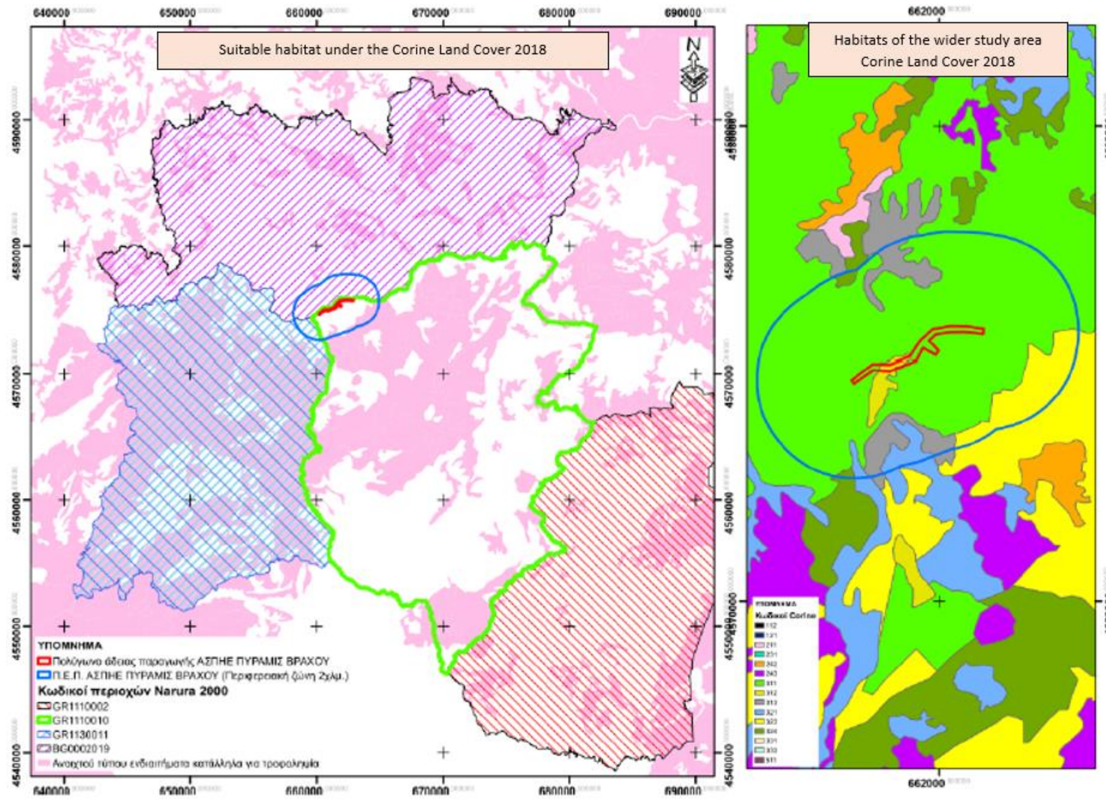
Map 60: *Distribution map of Bubo bubo in the broader study area*



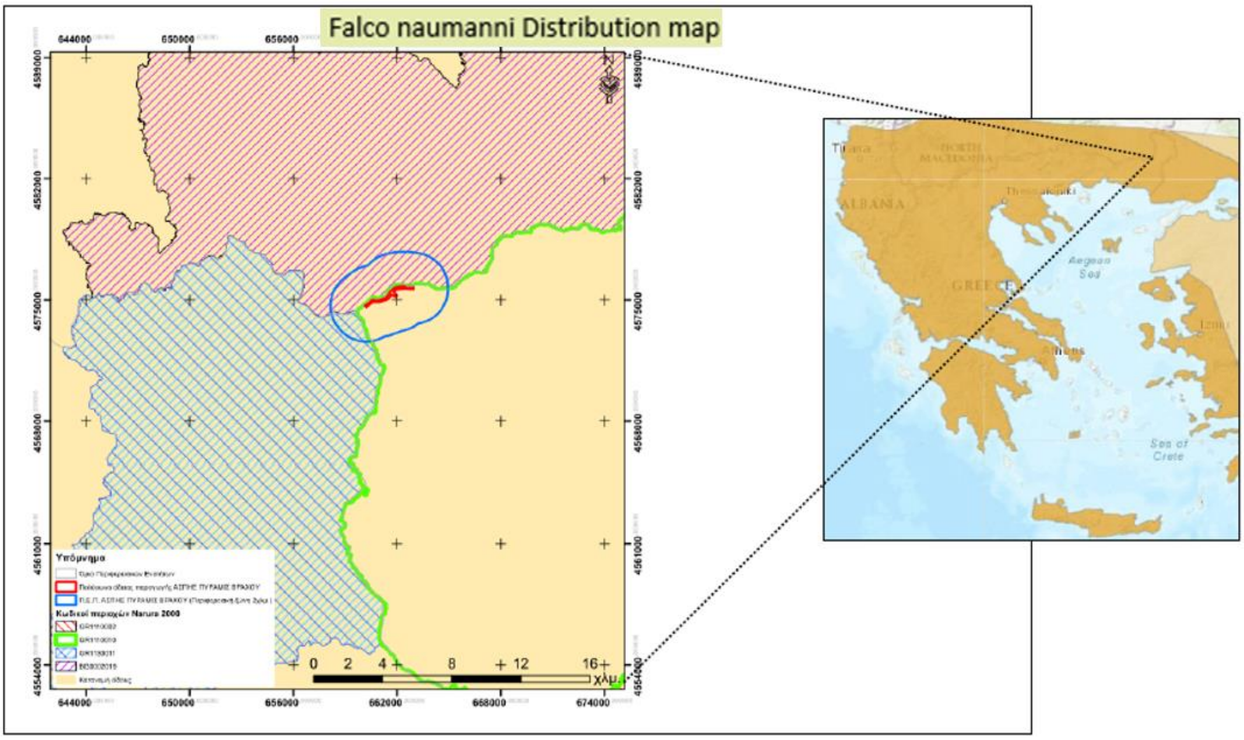
Map 61*: Habitat map of Bubo bubo in the broader study area*



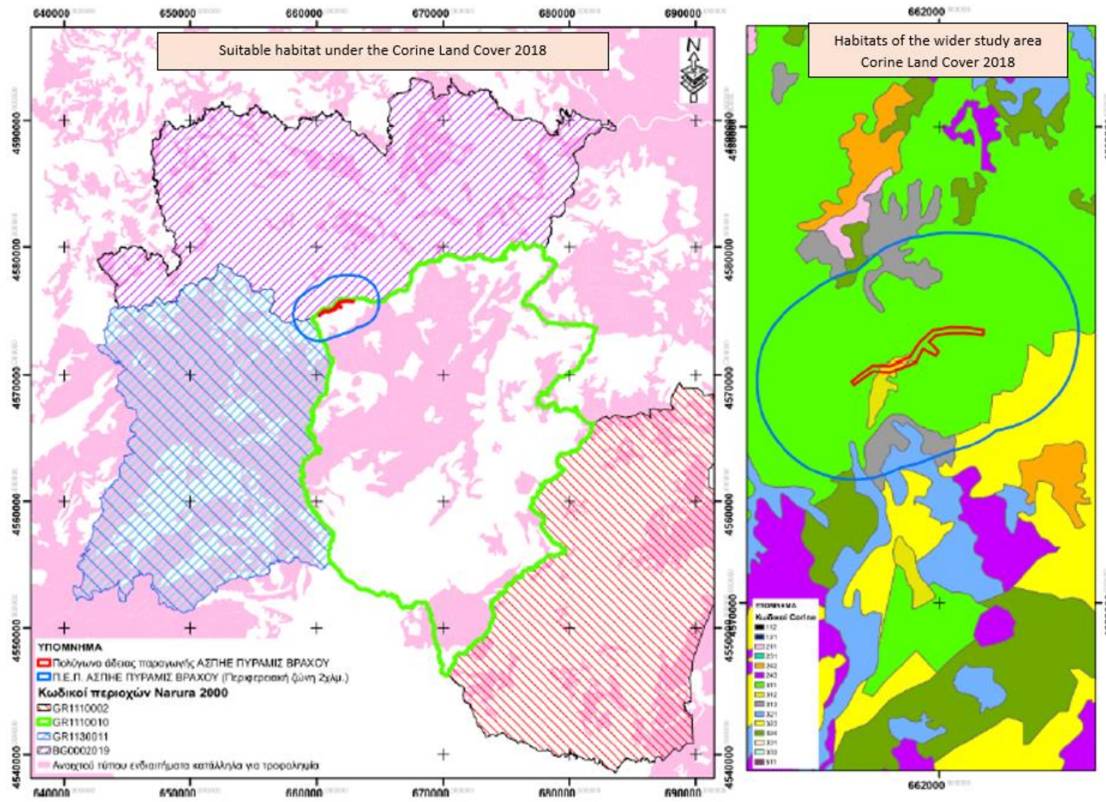
Map 62: *Distribution map of the Falco peregrinus in the broader study area*



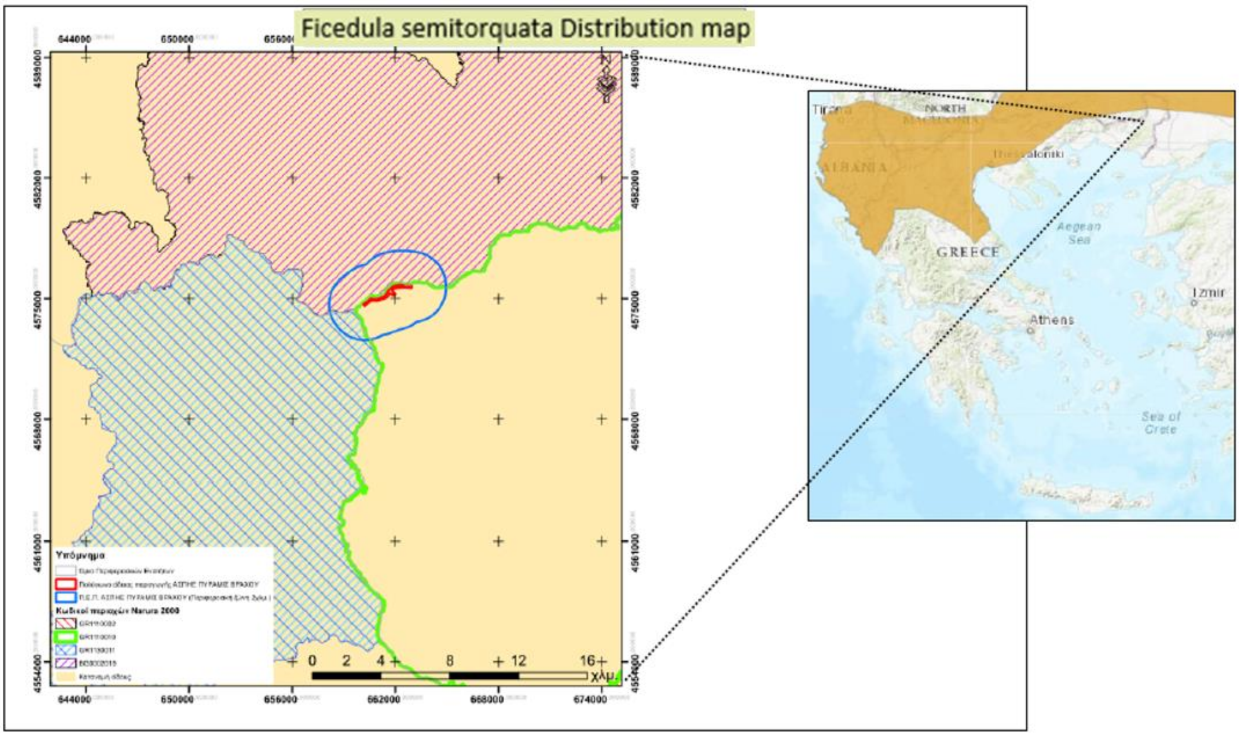
Map 63*: Habitat map of the Falco peregrinus in the broader study area*



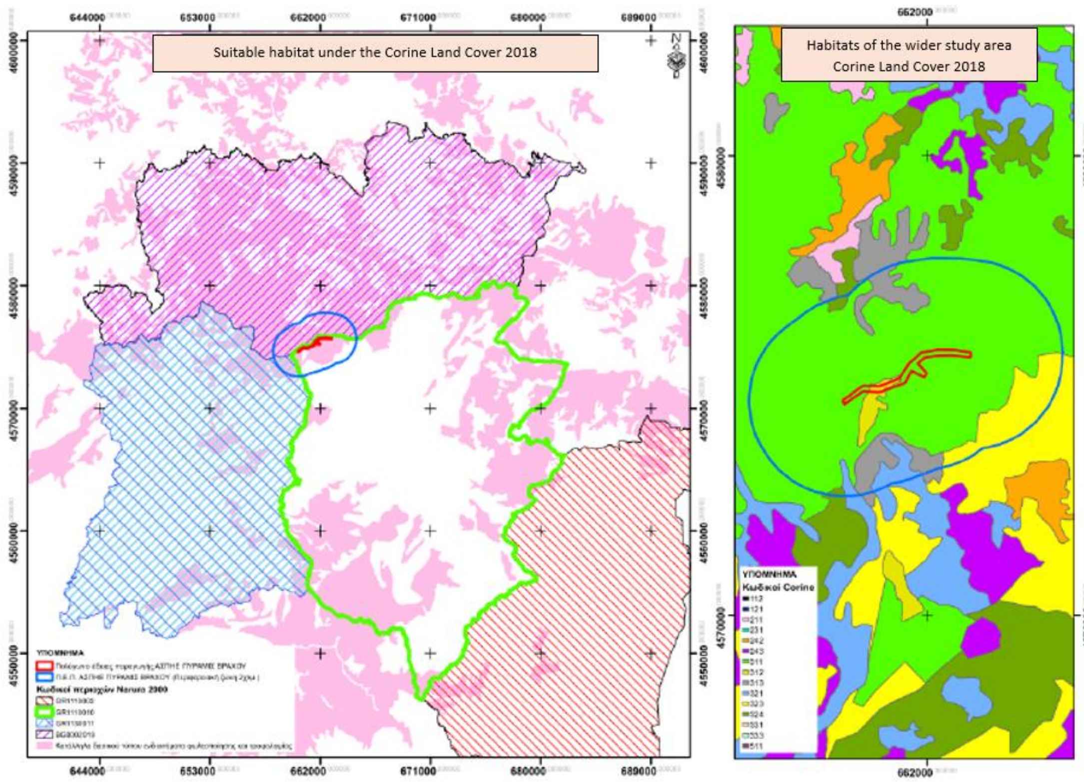
Map 64: *Distribution map of the Falco naumanni in the broader study area*



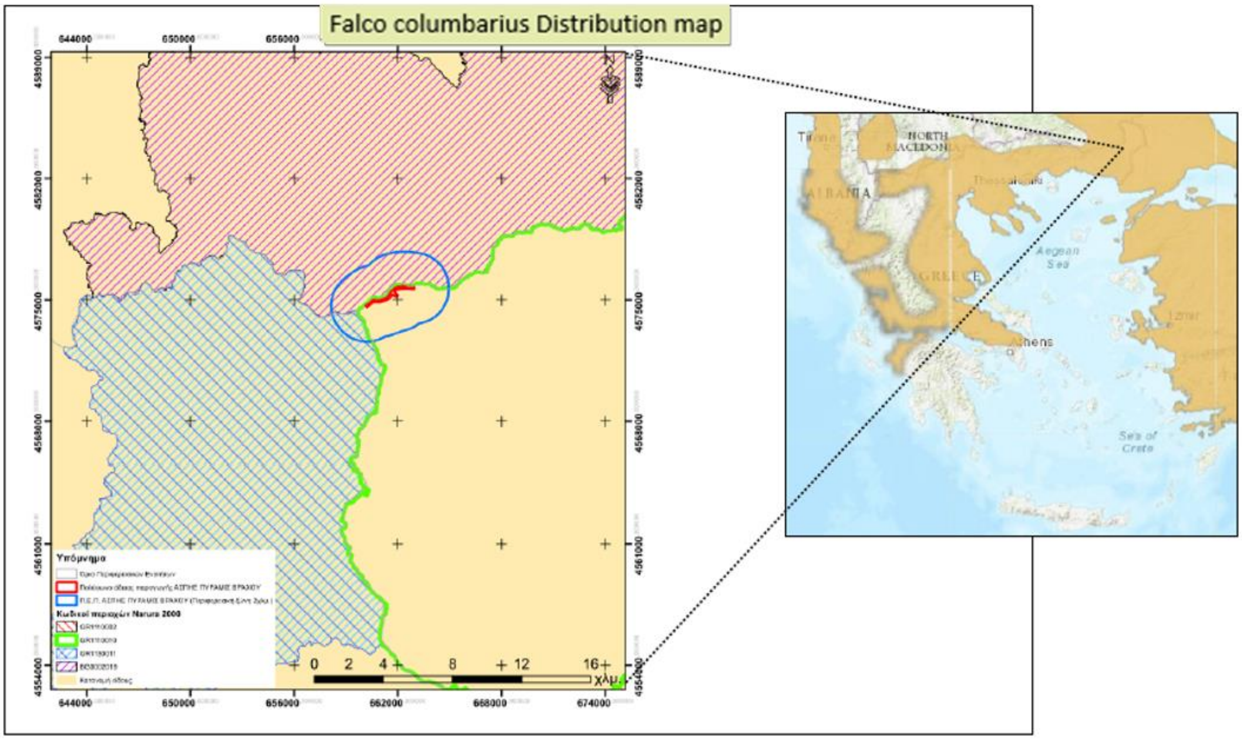
Map 65: *Habitat map of the Falco naumanni in the broader study area*



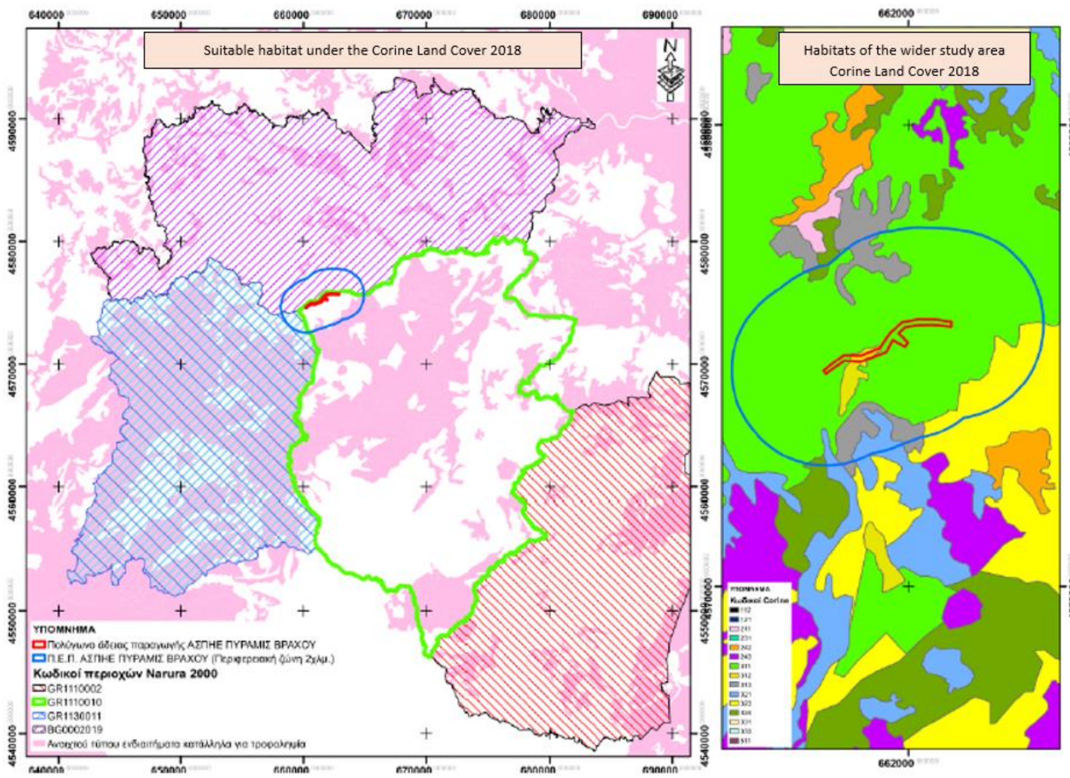
***Map 66**: Distribution map of Ficedula semitorquata in the Broader study area*



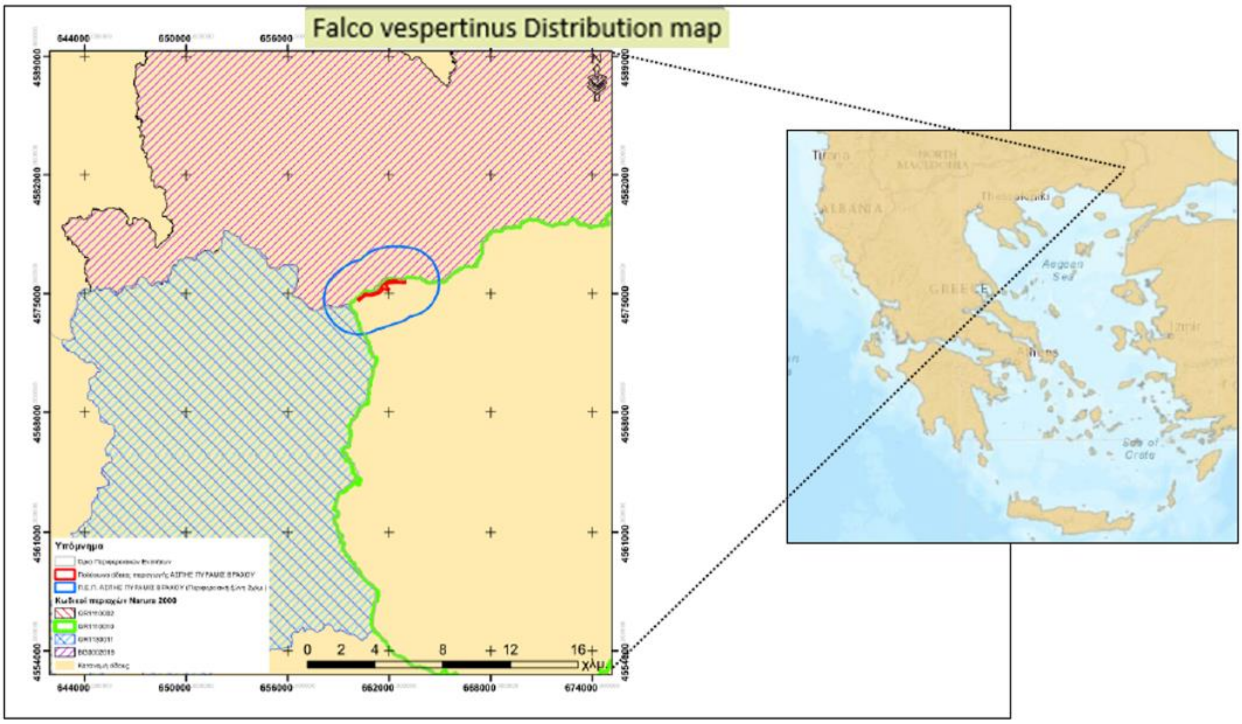
***Map 67:** Habitat map of the Ficedula semitorquata in the broader study area*



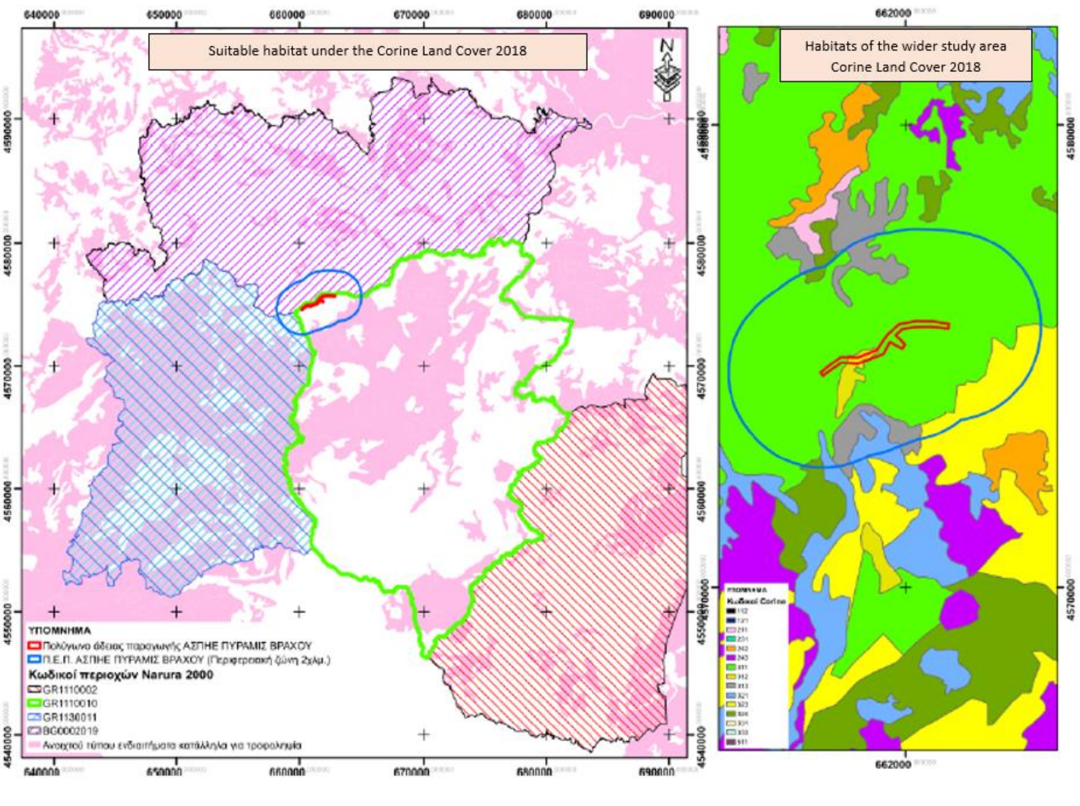
***Map 68**: Distribution map of the Falco columbarius in the broader study area*



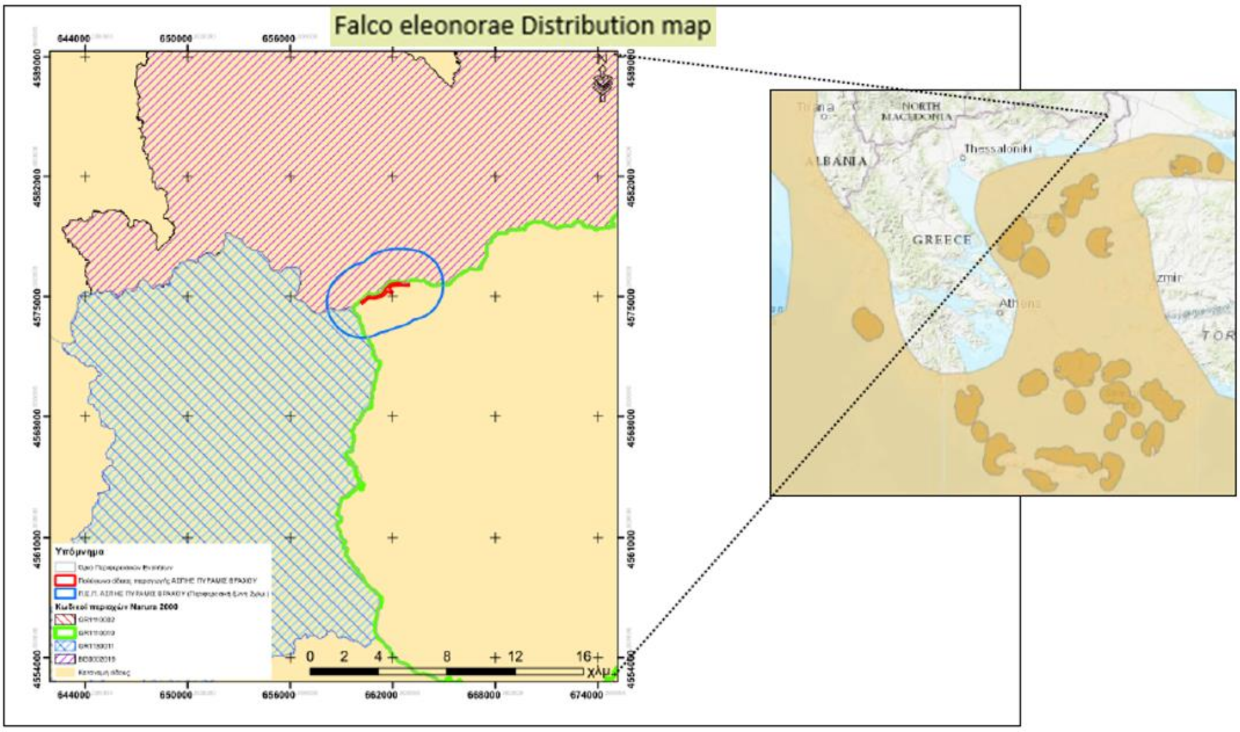
***Map 69:** Habitat map of the Falco columbarius in the broader study area*



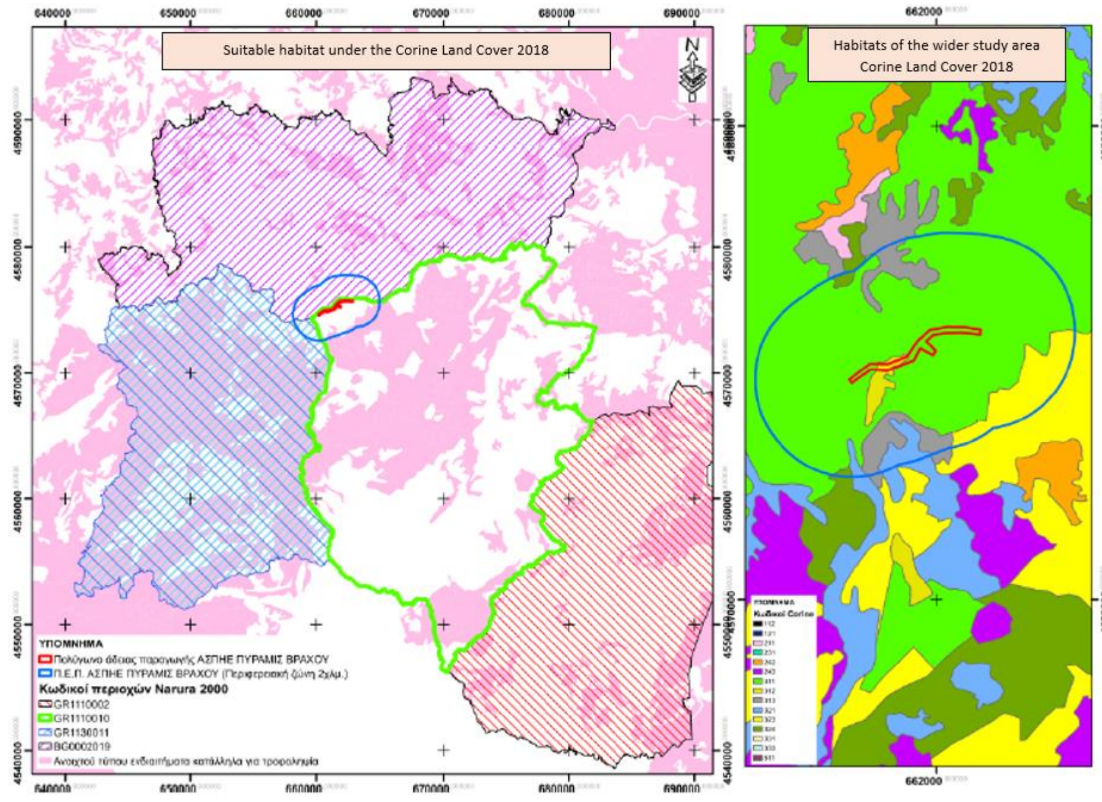
Map 70: *Distribution map of the Falco vespertinus in the broader study area*



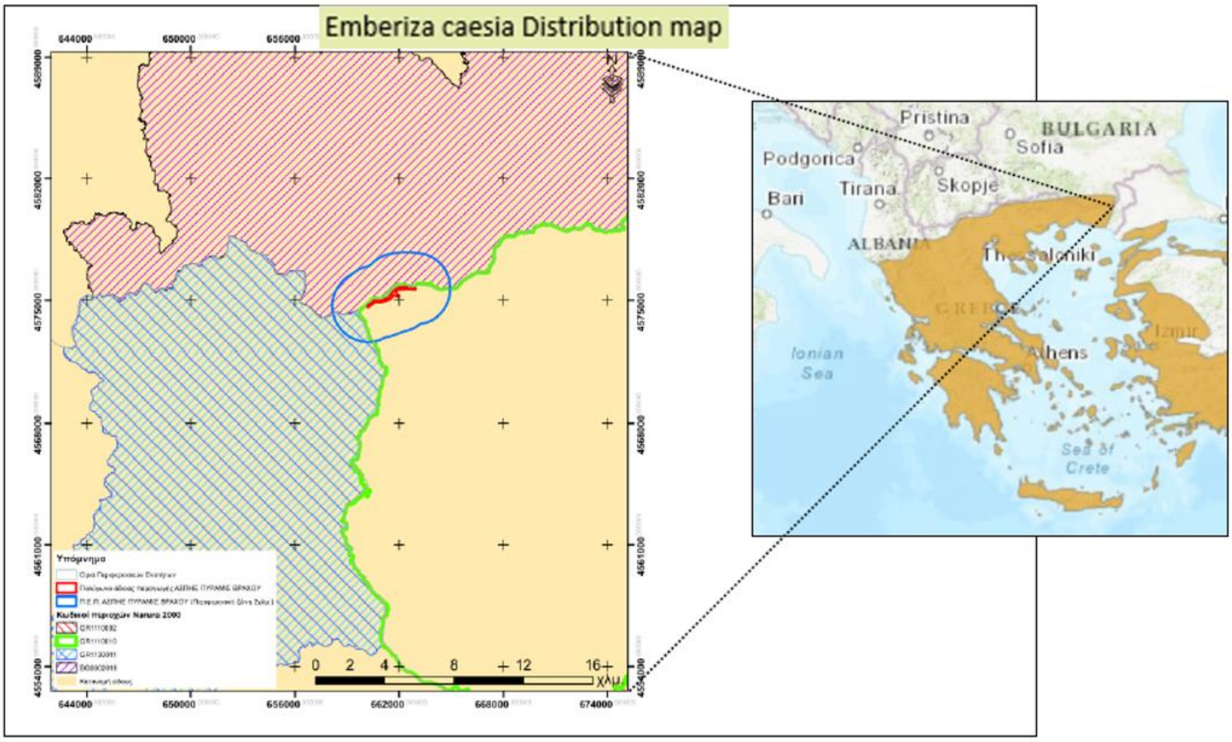
Map 71*: Habitat map of the Falco vespertinus in the broader study area*



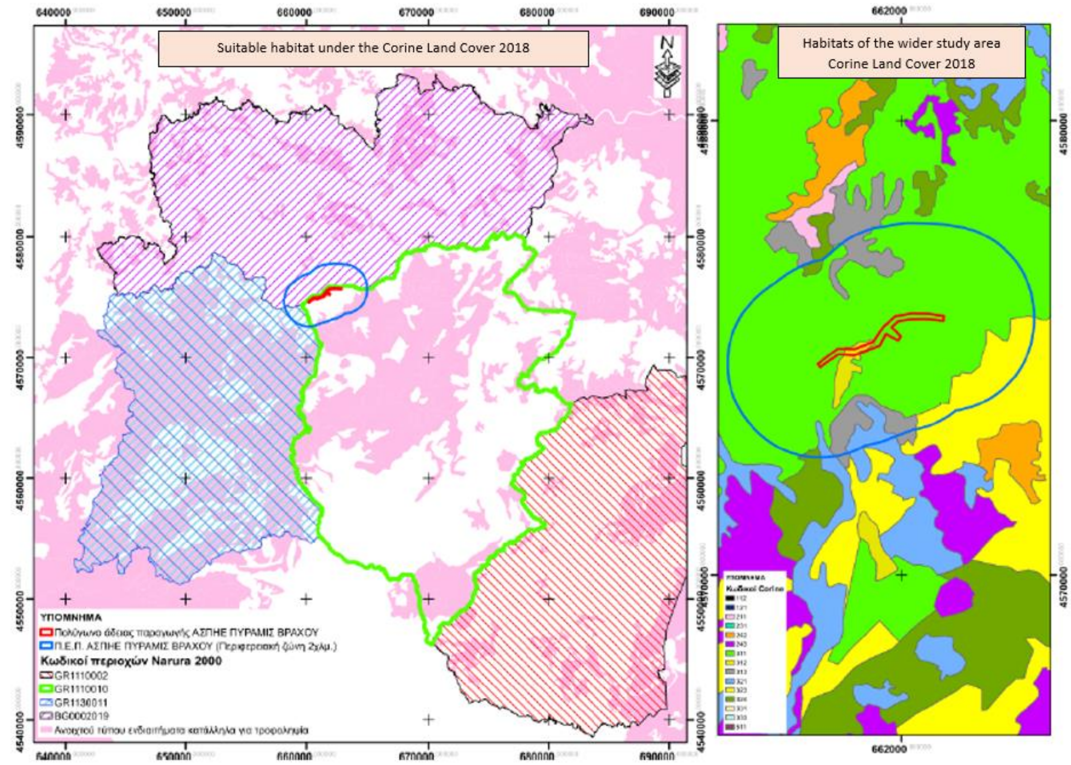
***Map 72**: Distribution map of the Falco eleonorae in the broader study area*



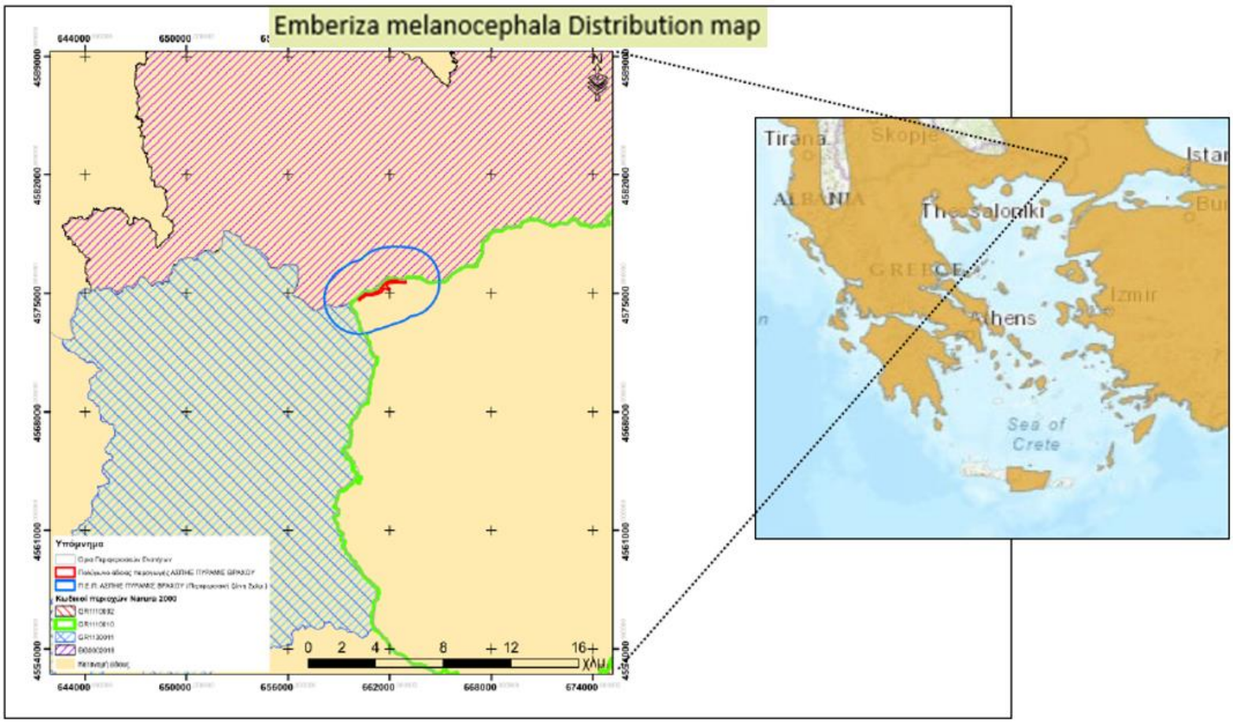
***Map 73**: Habitat map of the Falco eleonorae in the broader study area*



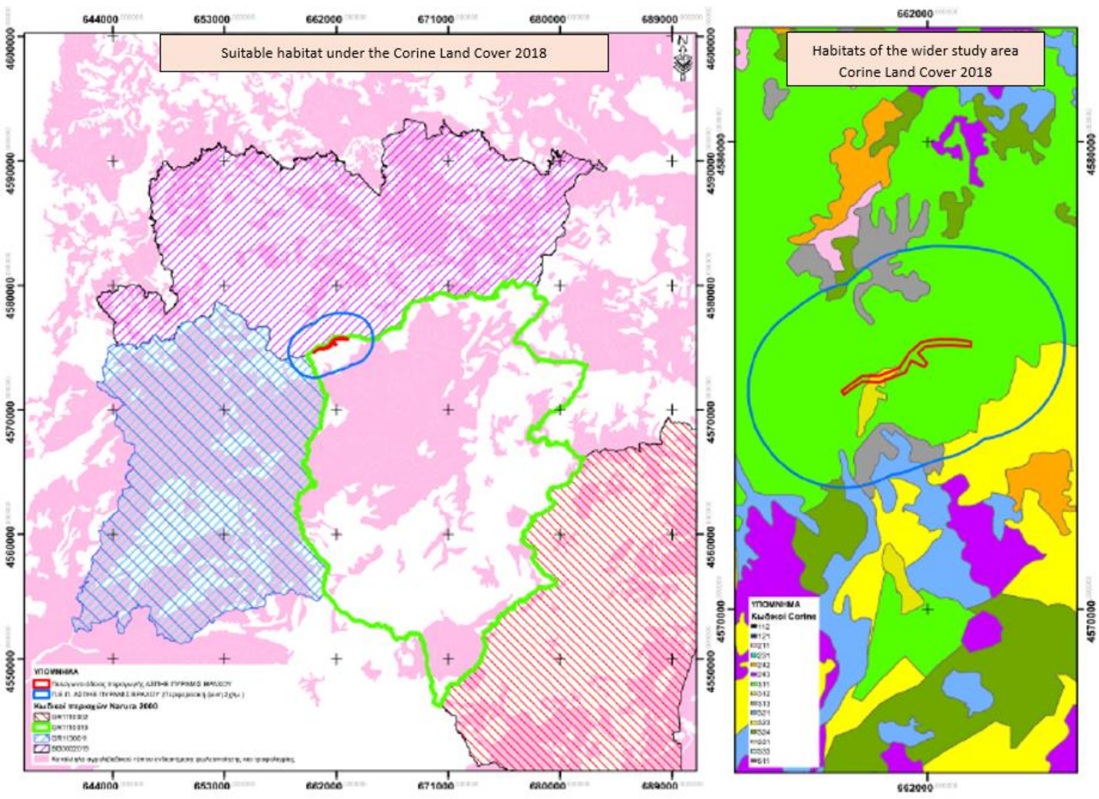
***Map 74**: Distribution map of Emberiza caesia in the broader study area*



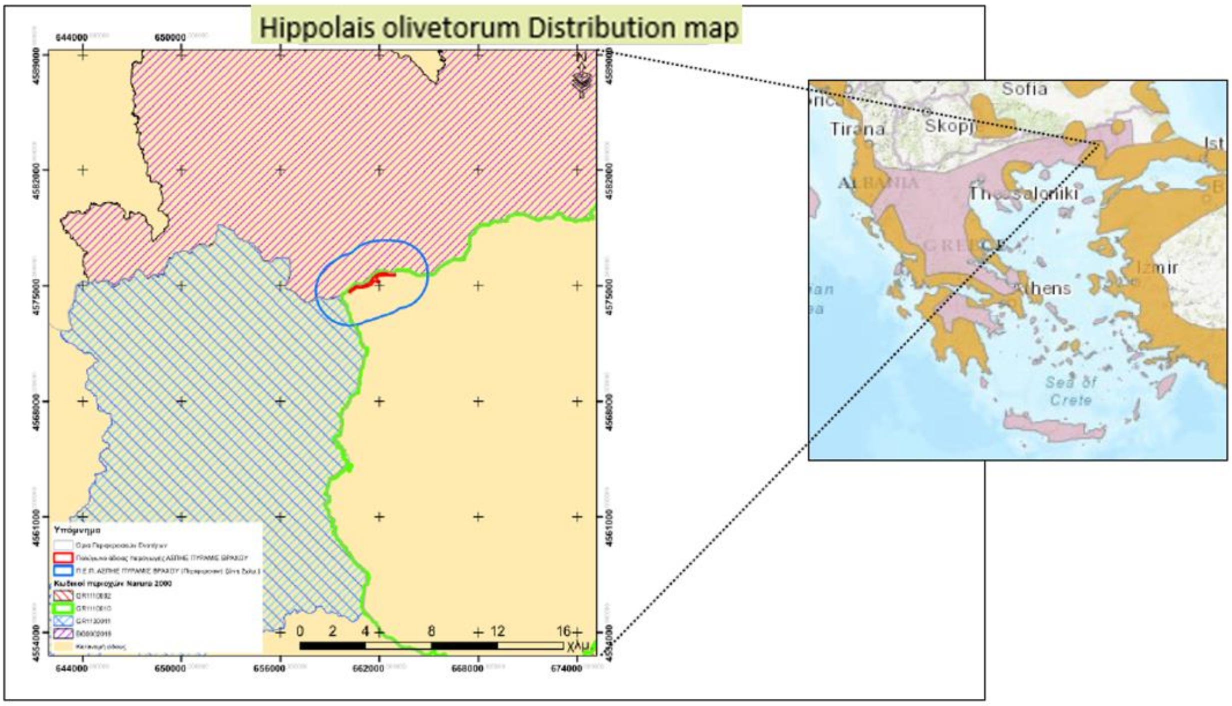
***Map 75:** Habitat map of the Emberiza caesia in the broader study area*



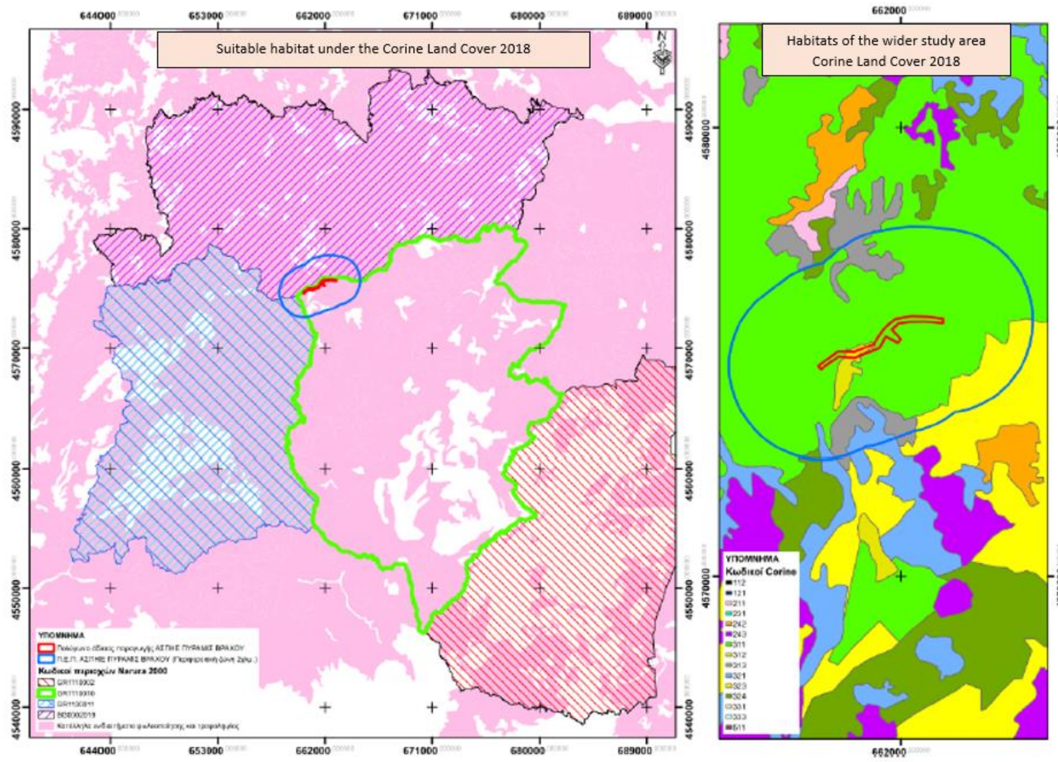
Map 76: Distribution map of the Emberiza melanocephala in the broader study area



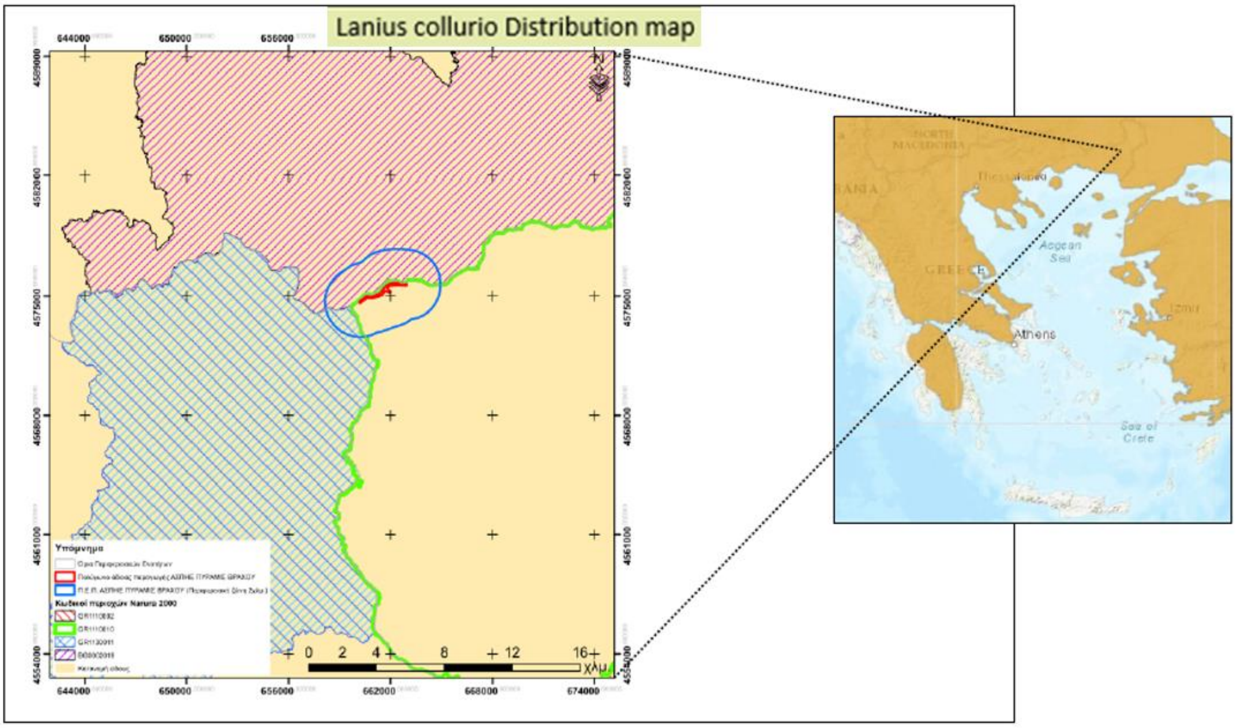
Map 77: Habitat map of the Emberiza melanocephala in the broader study area



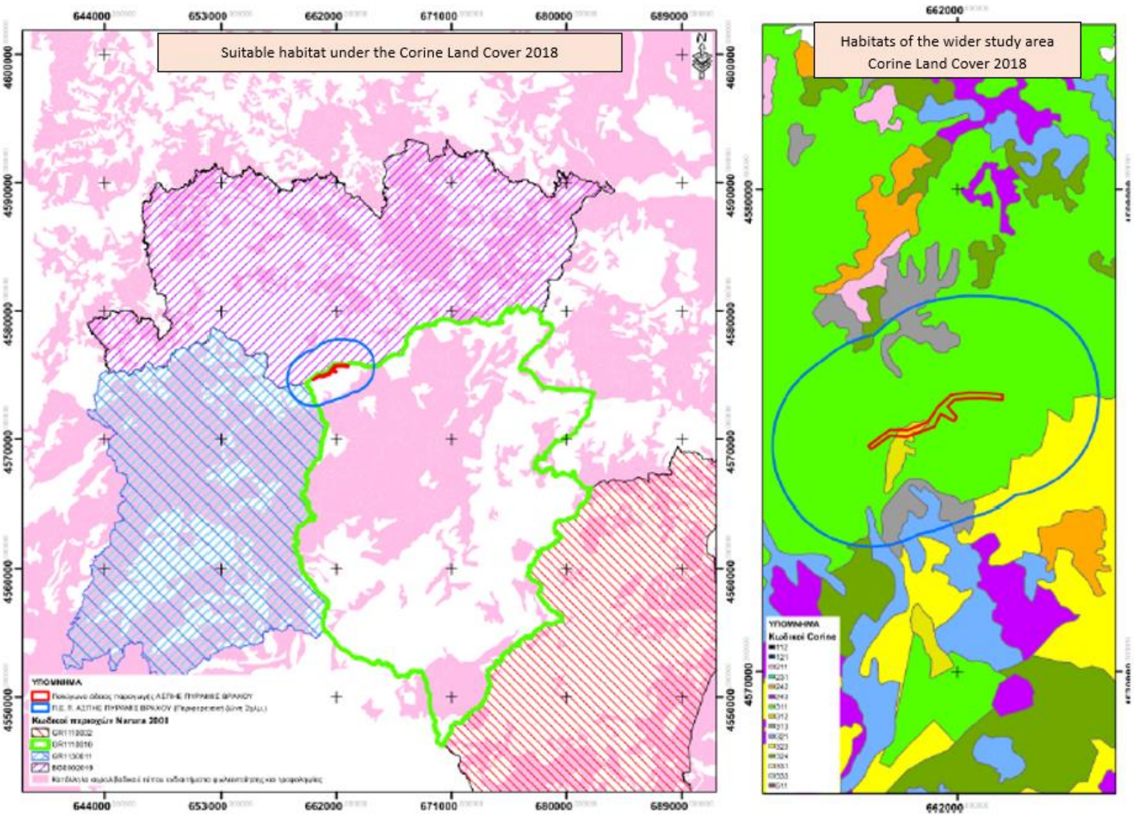
Map 78: *Distribution map of the Hippolais olivetorum in the broader study area*



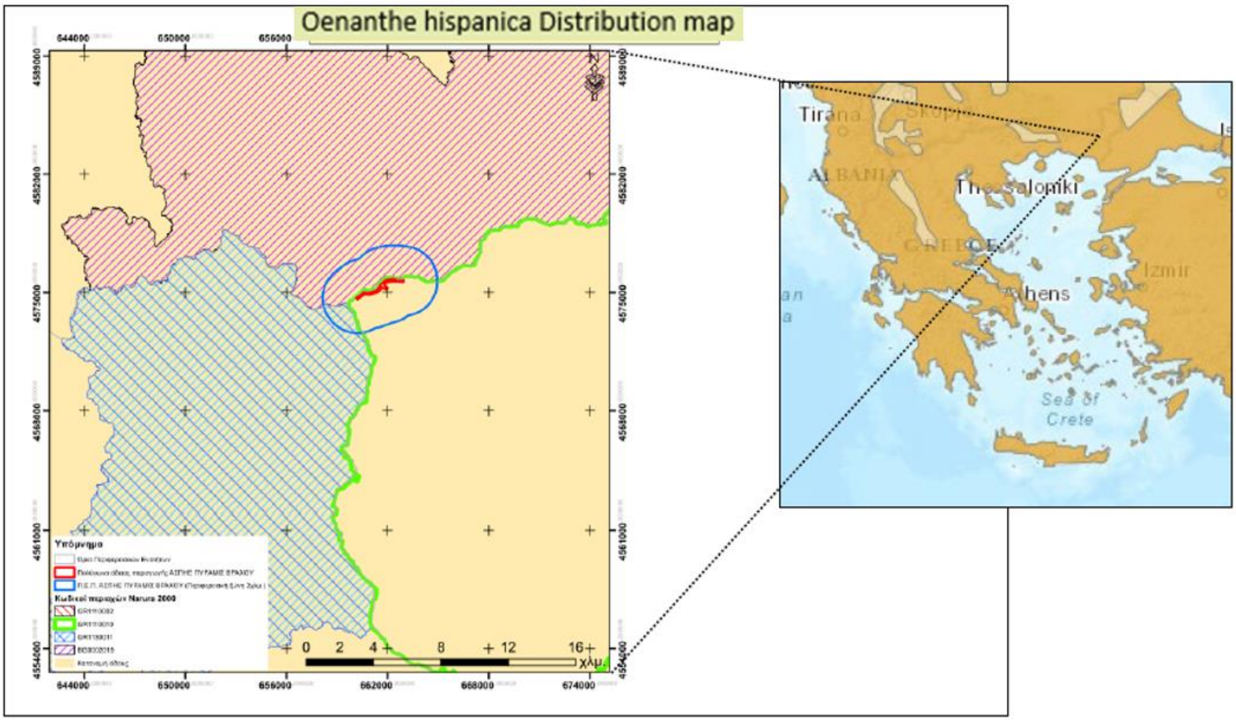
Map 79: *Habitat map of the Hippolais olivetorum in the broader study area*



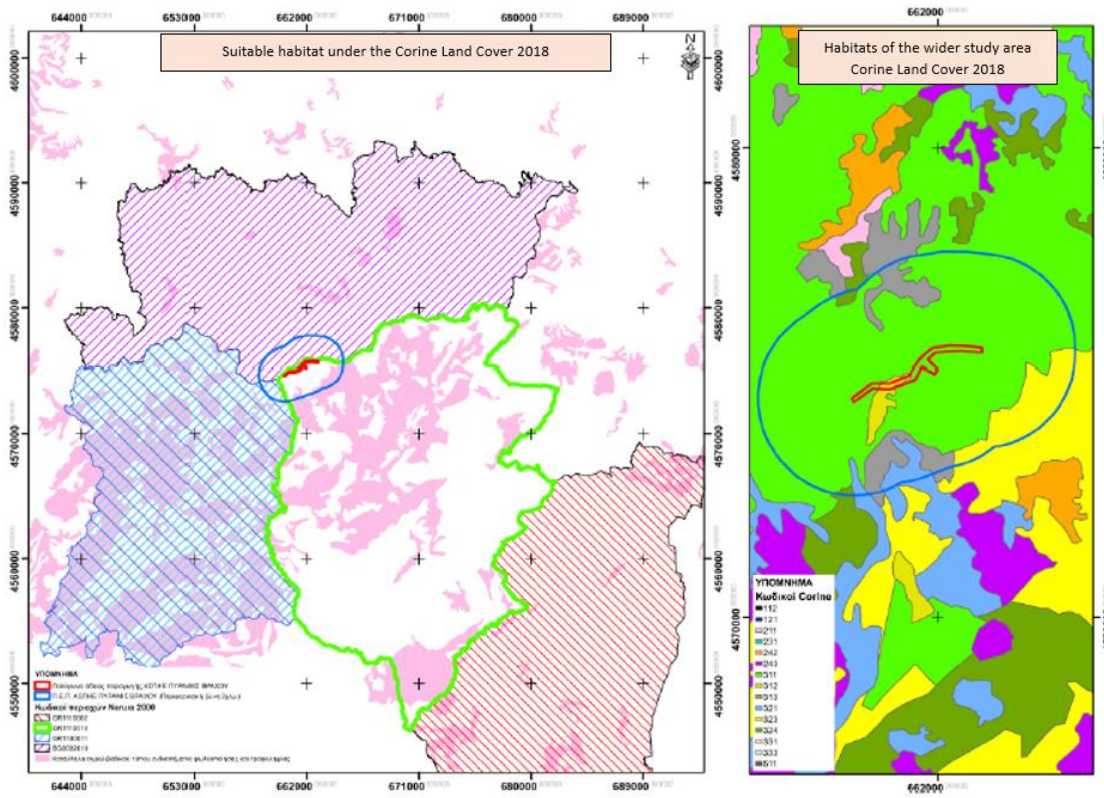
***Map 80**: Distribution map of the Lanius collurio in the broader study area*



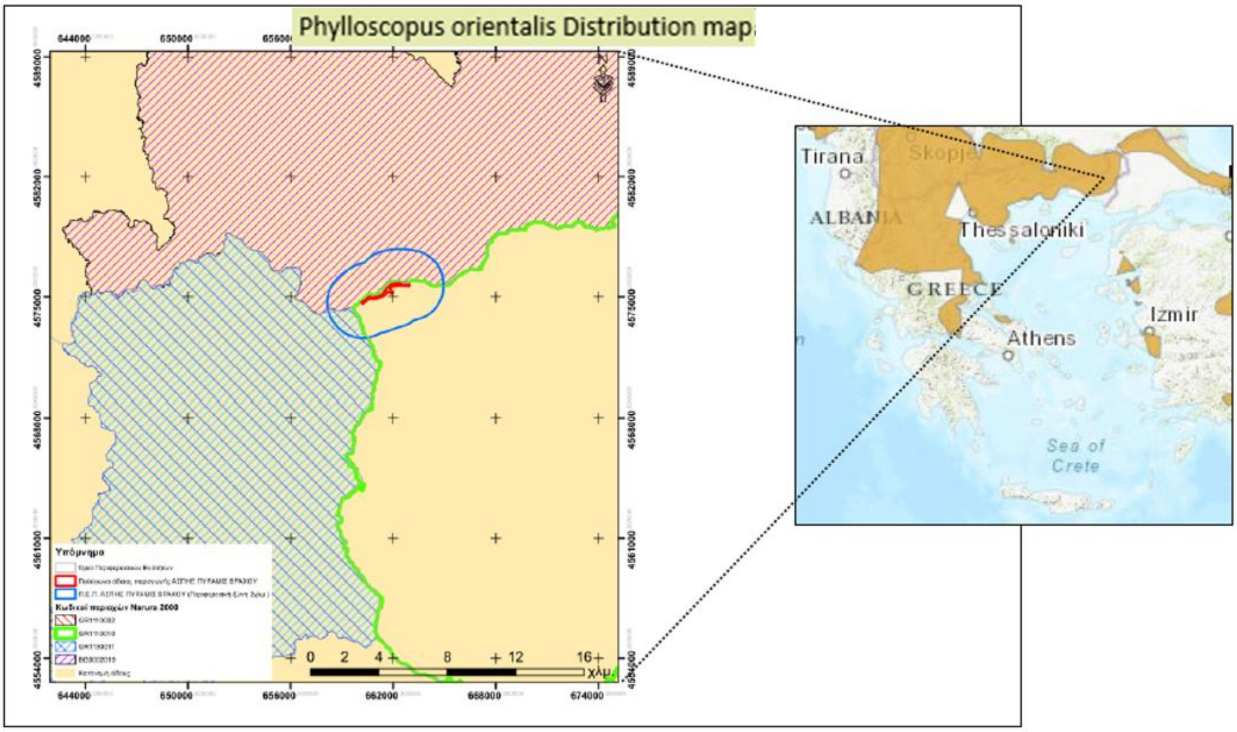
***Map 81**: Habitat map of the Lanius collurio in the broader study area*



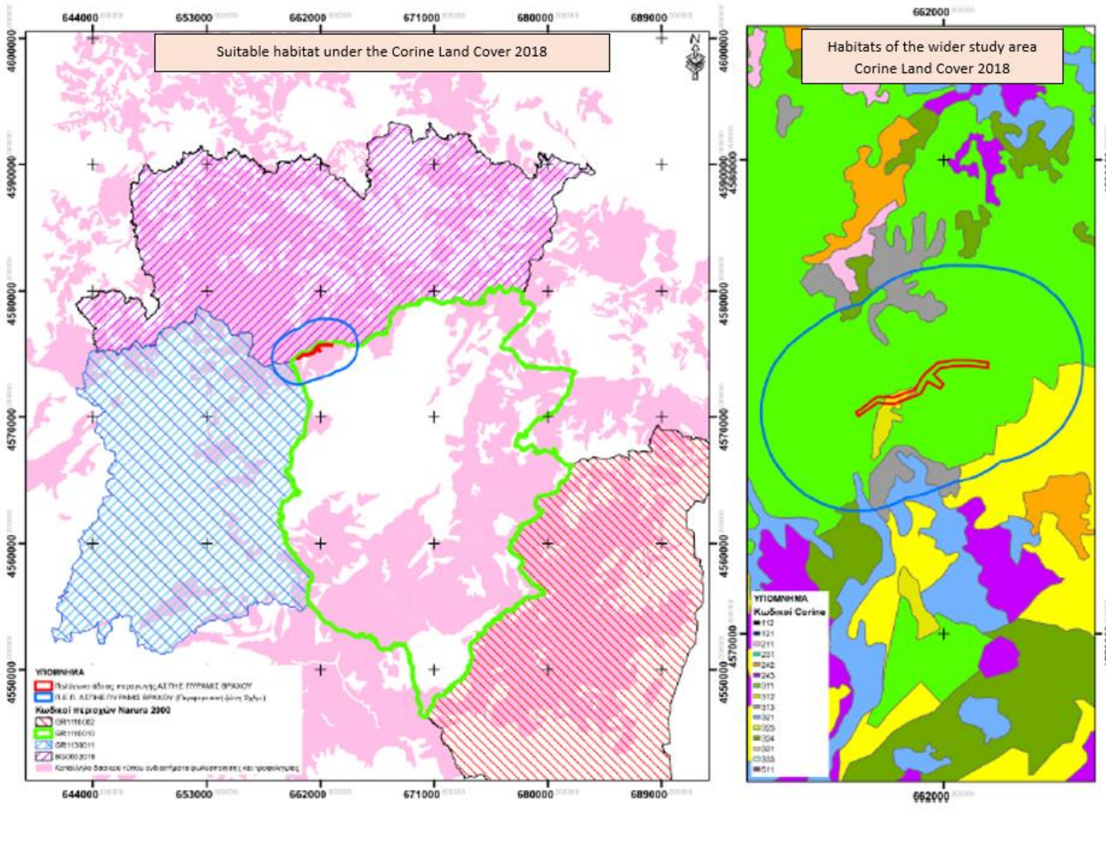
Map 82: Distribution map of the Oenanthe hispanica in the broader study area



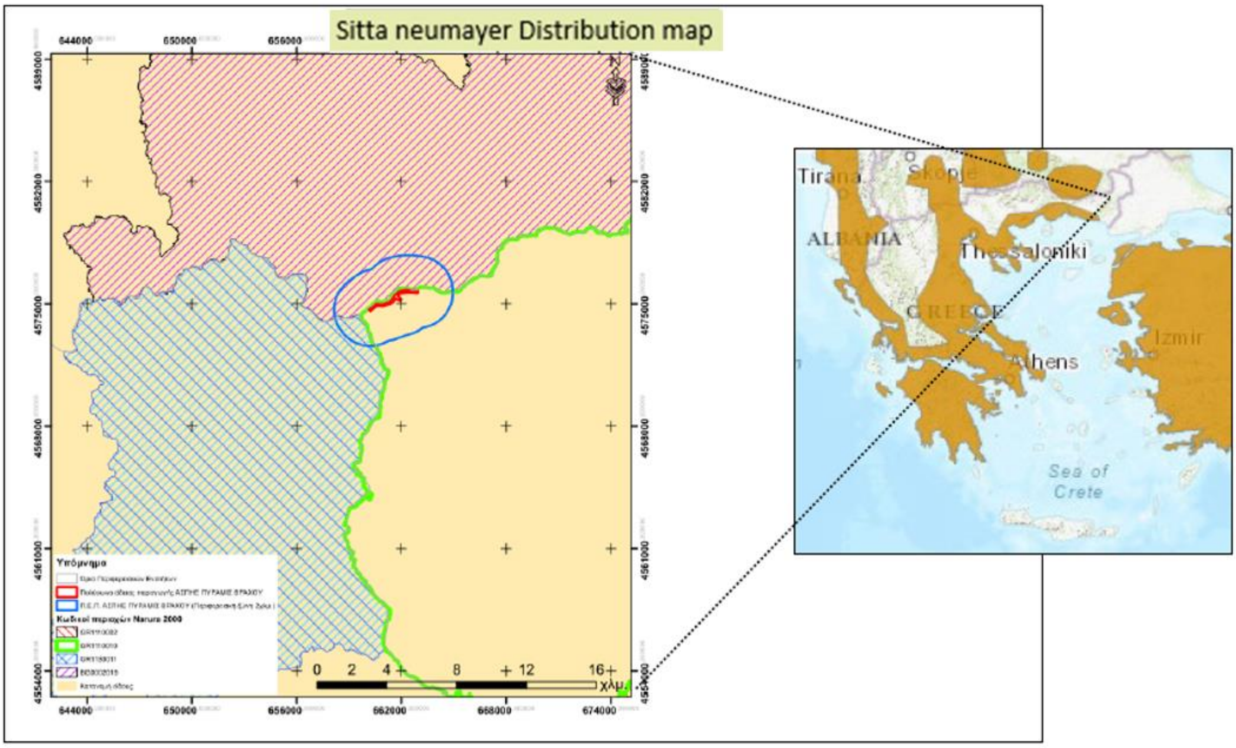
Map 83: Habitat map of the Oenanthe hispanica in the broader study area



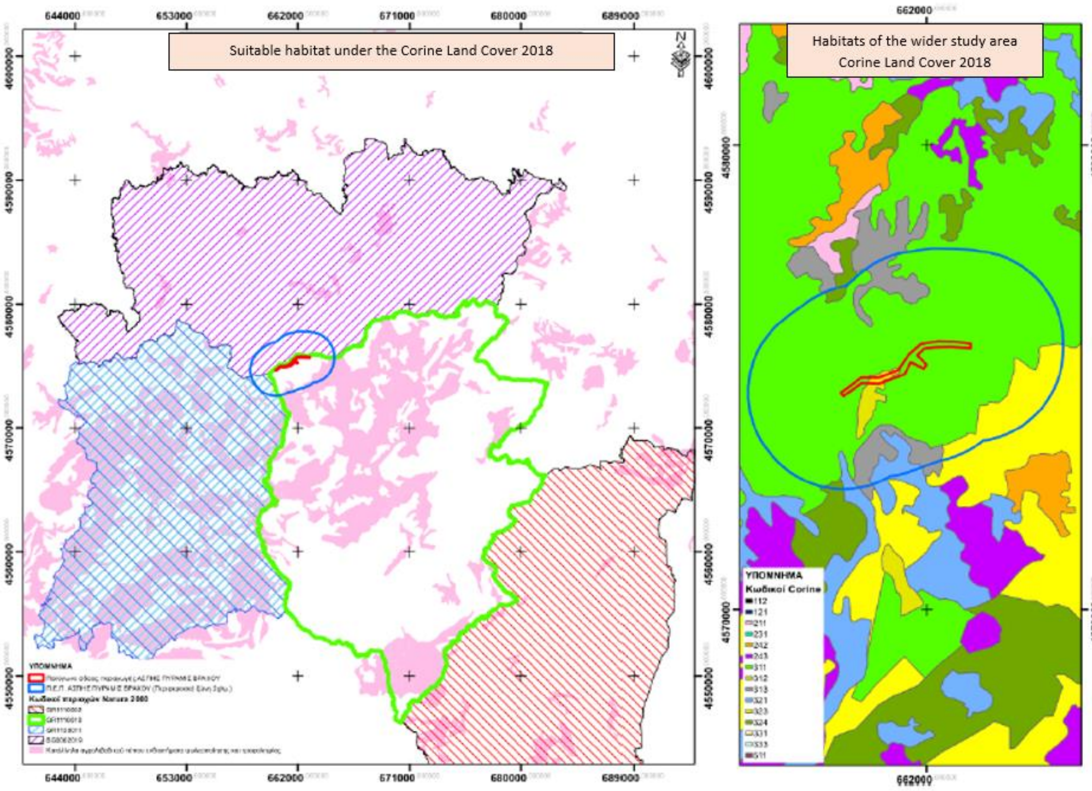
Map 84: *Distribution map of the Phylloscopus orientalis in the broader study area*



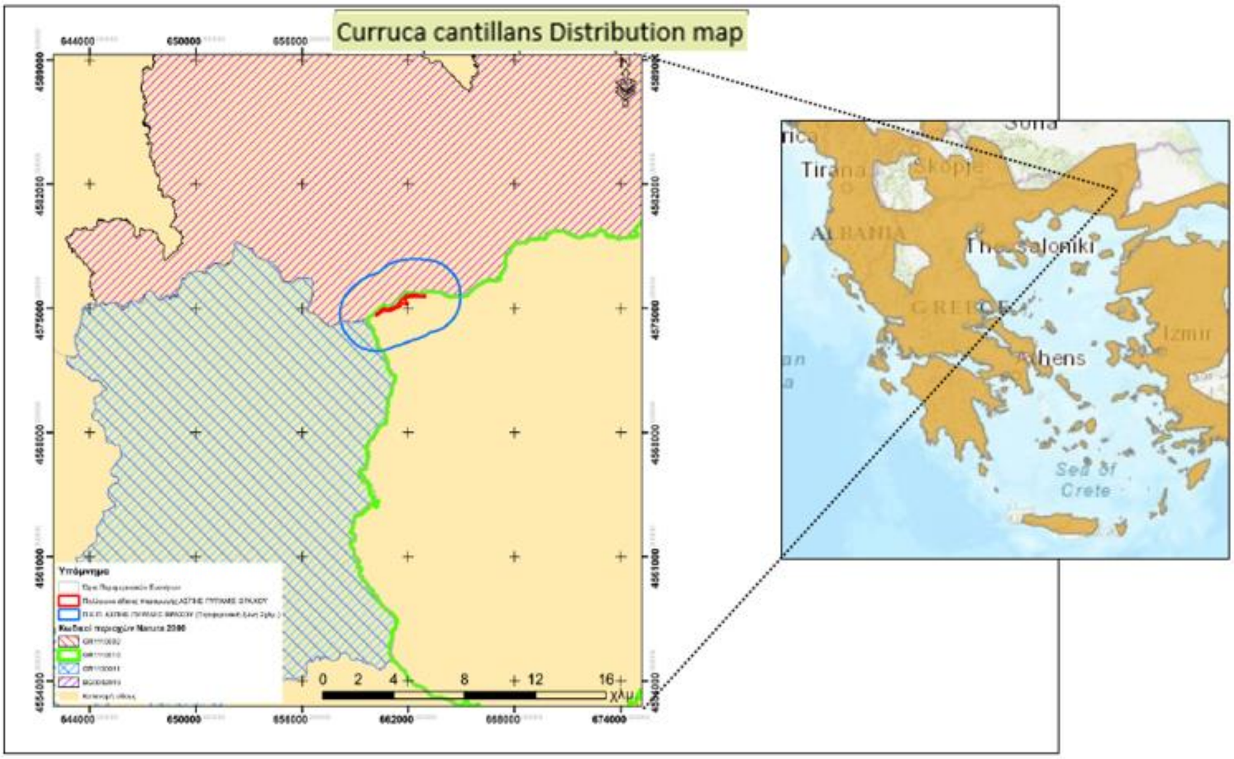
Map 85: *Habitat map of the Phylloscopus orientalis in the broader study area*



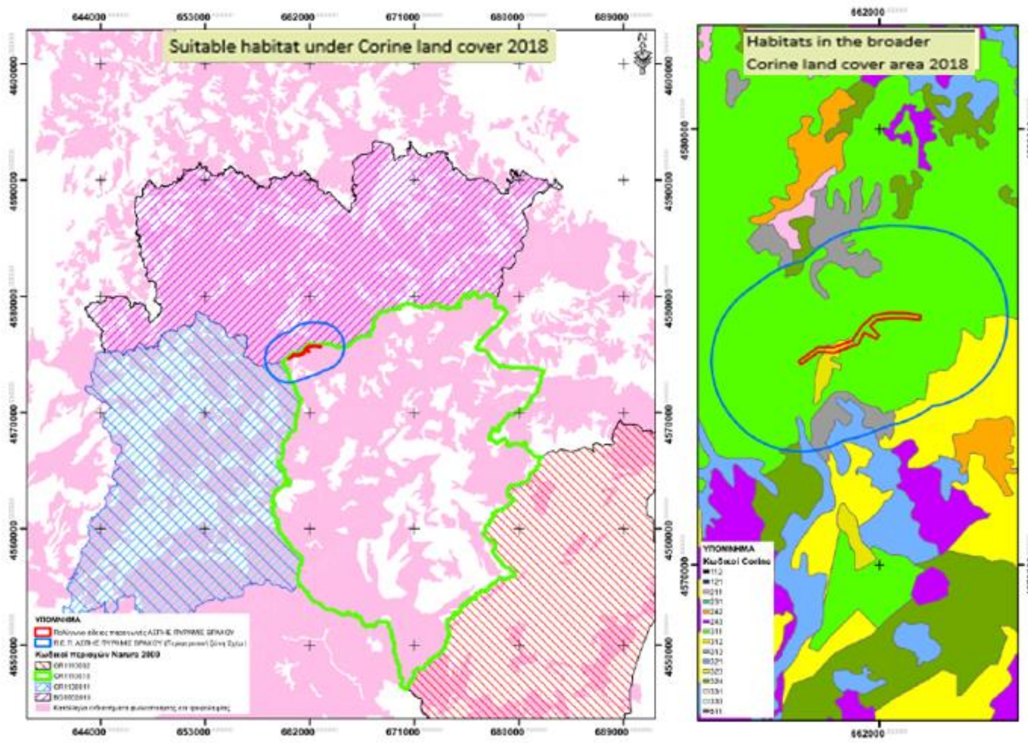
Map 86: *Distribution map of the Sitta neumayer in the broader study area*



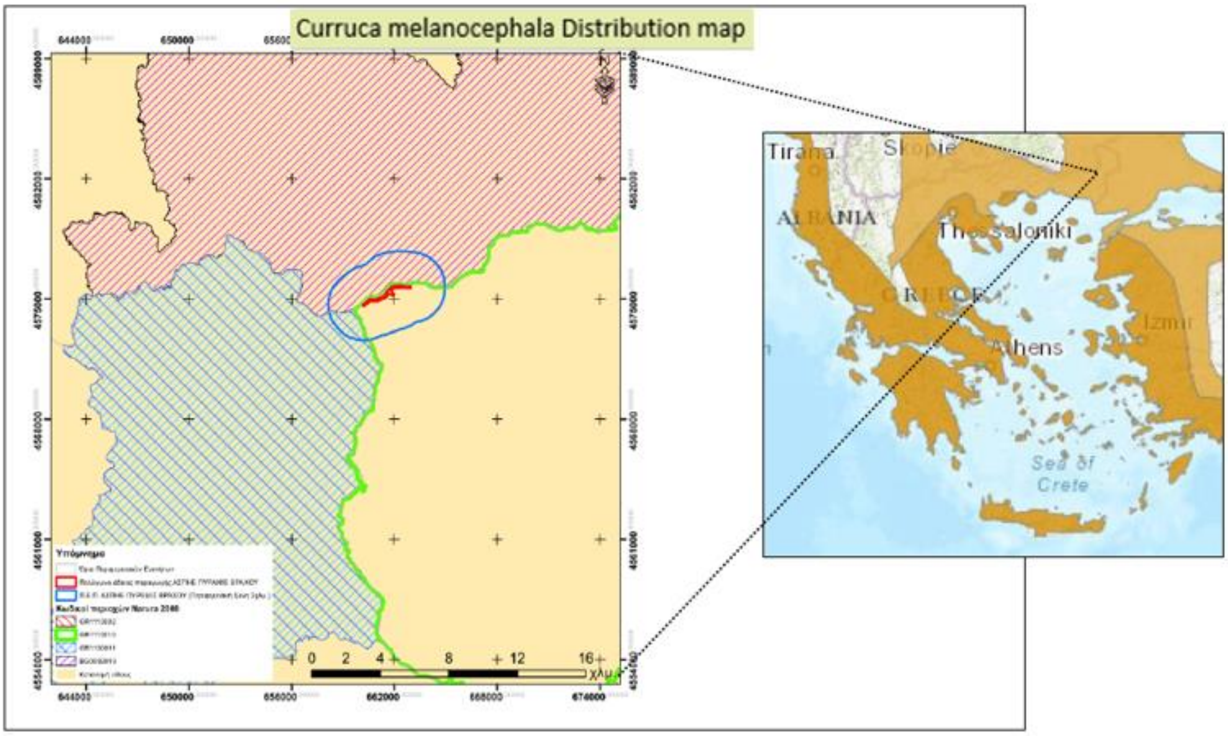
Map 87: *Habitat map of Sitta neumayer in the broader study area*



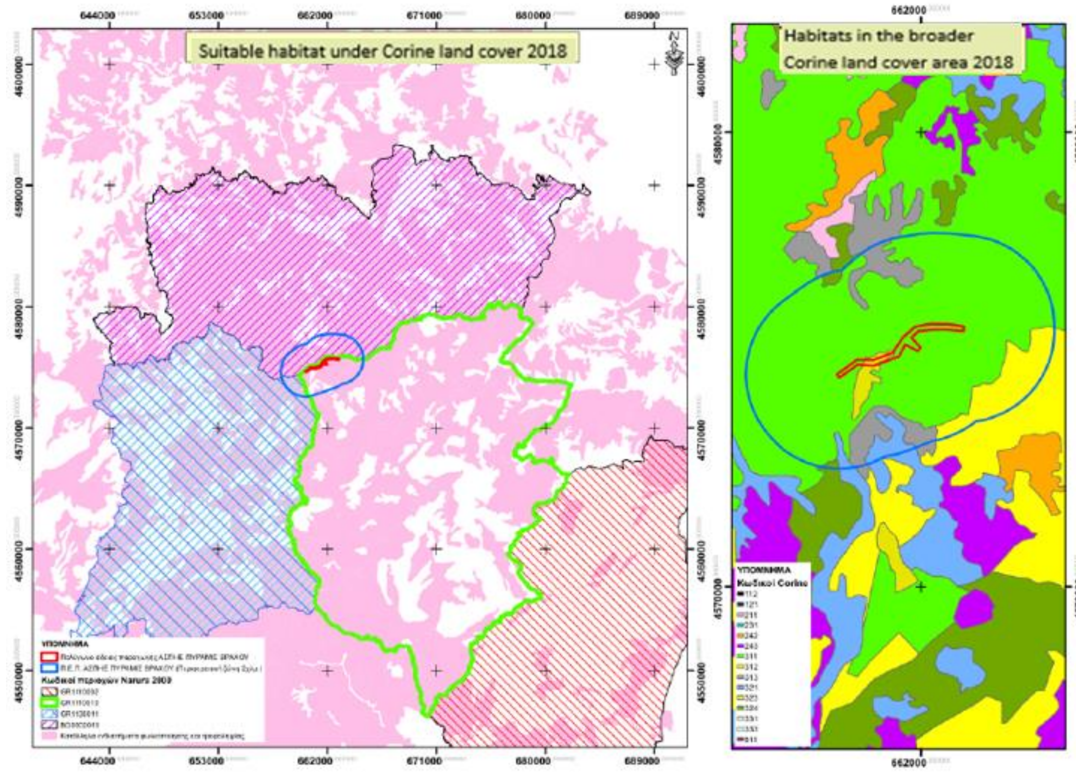
Map 88: *Distribution map of the Curruca cantillans in the broader study area*



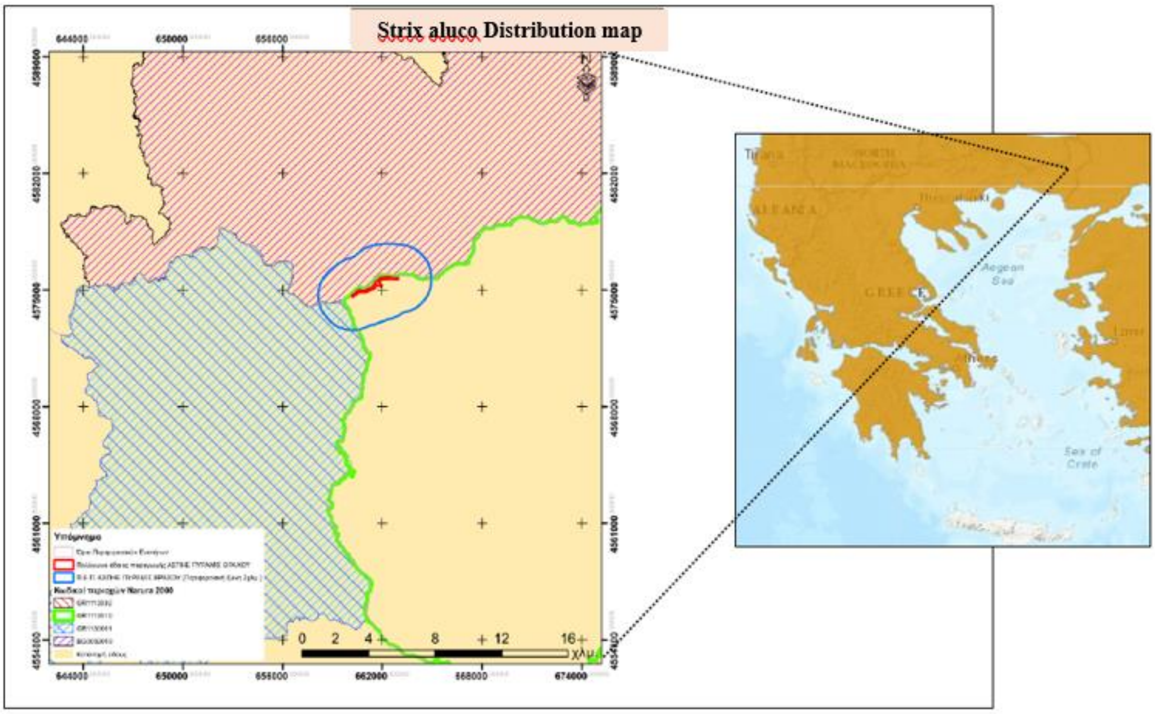
Map 89: *Habitat map of the Curruca cantillans in the broader study area*



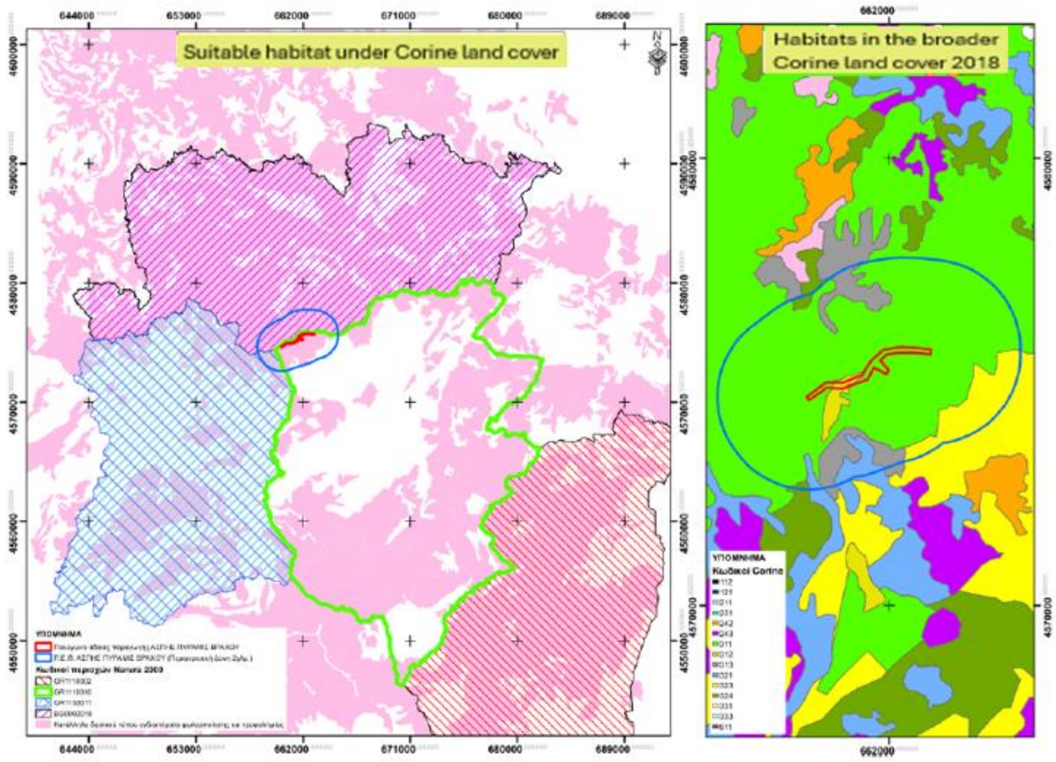
Map 90: *Distribution map of the Curruca melanocephala in the broader study area*



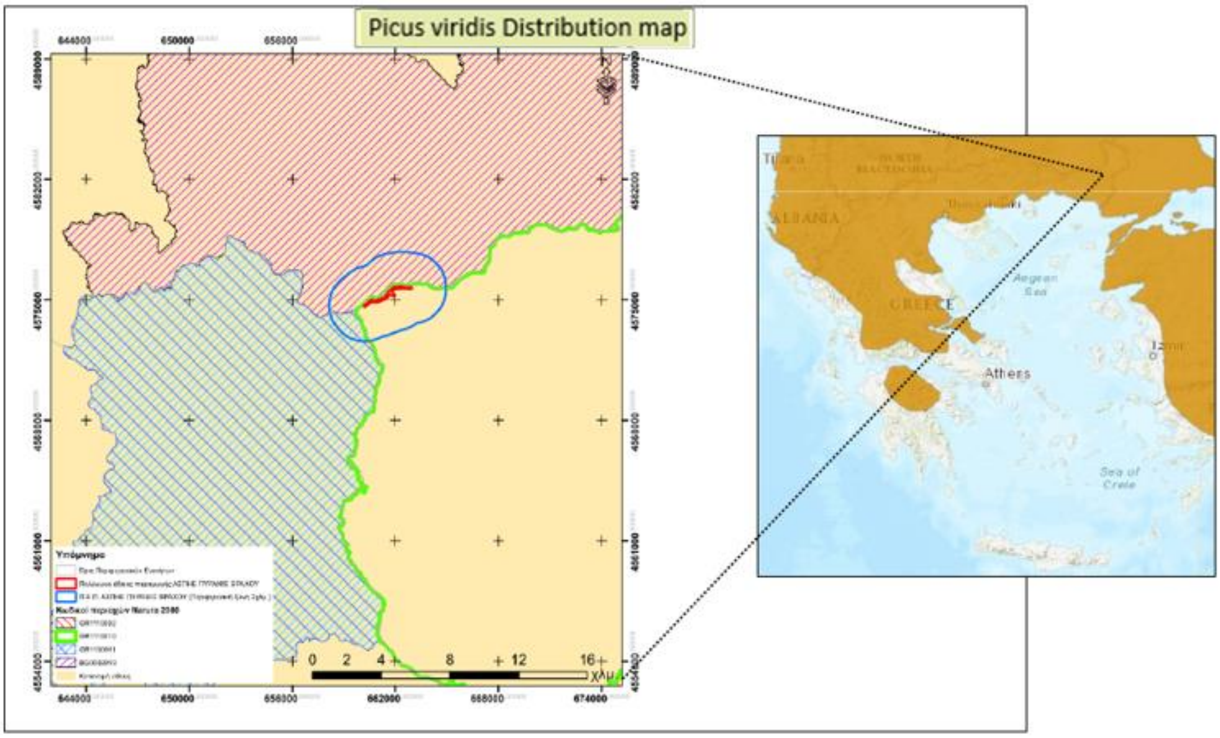
Map 91*: Habitat map of the Curruca melanocephala in the broader study area*



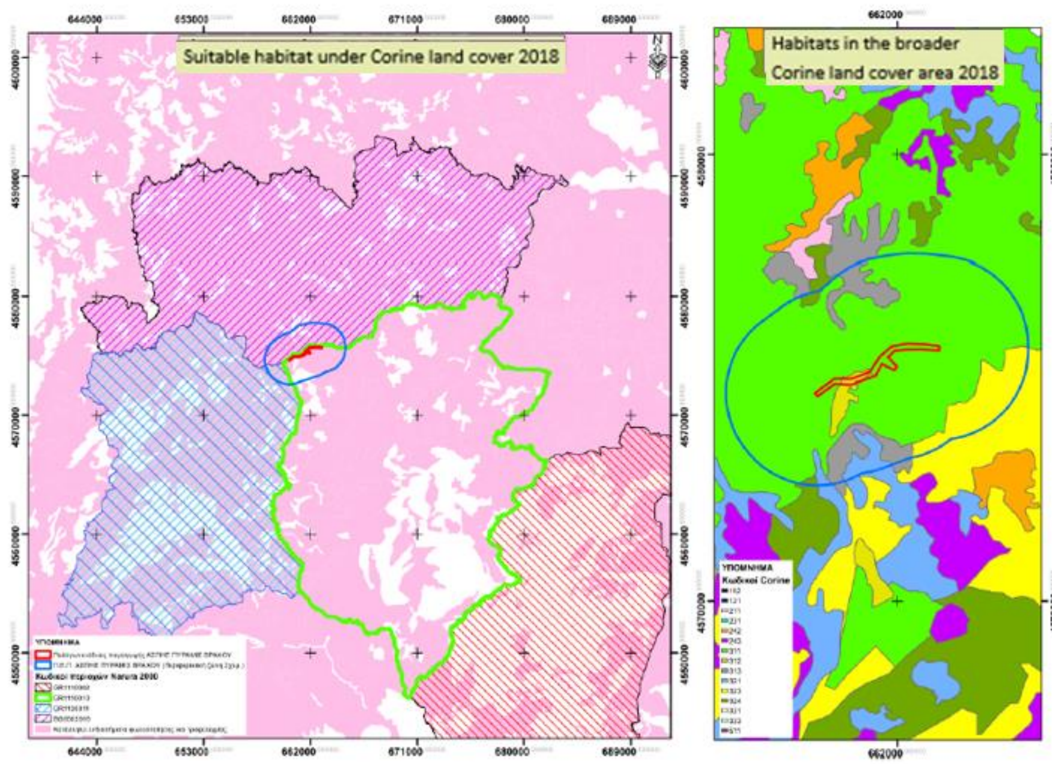
__Map 92:__ Distribution map of the Strix aluco in the broader study area



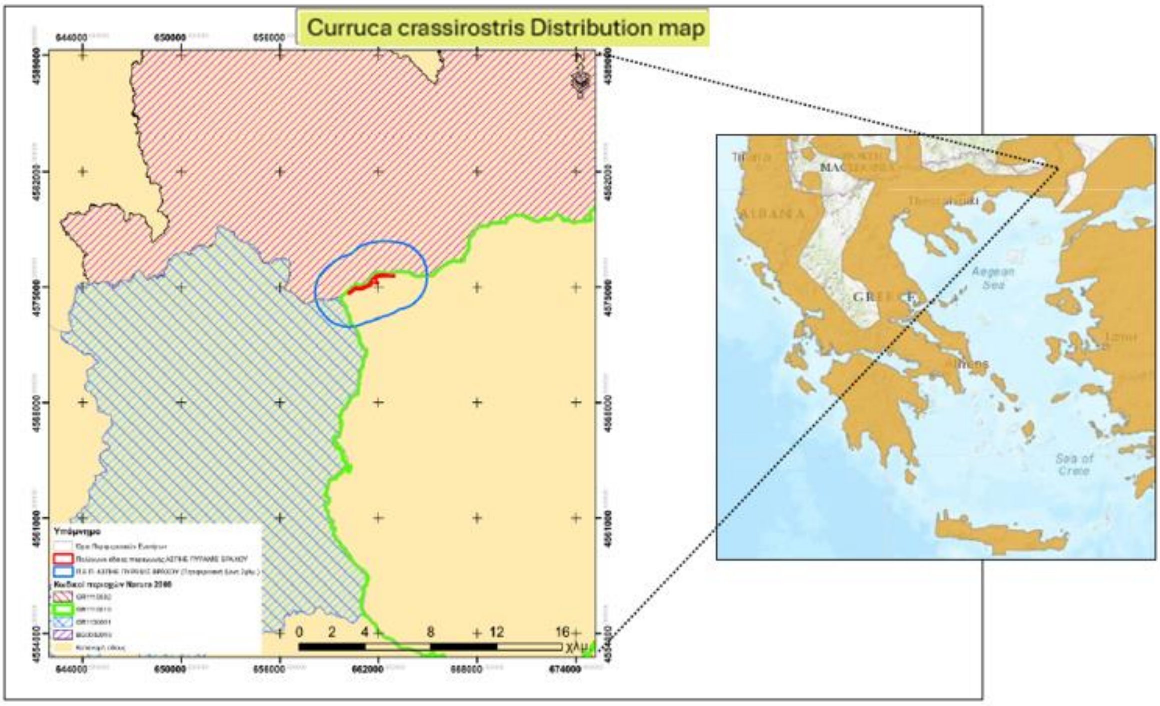
__Map 93:__ Habitat map of the Strix aluco in the broader study area



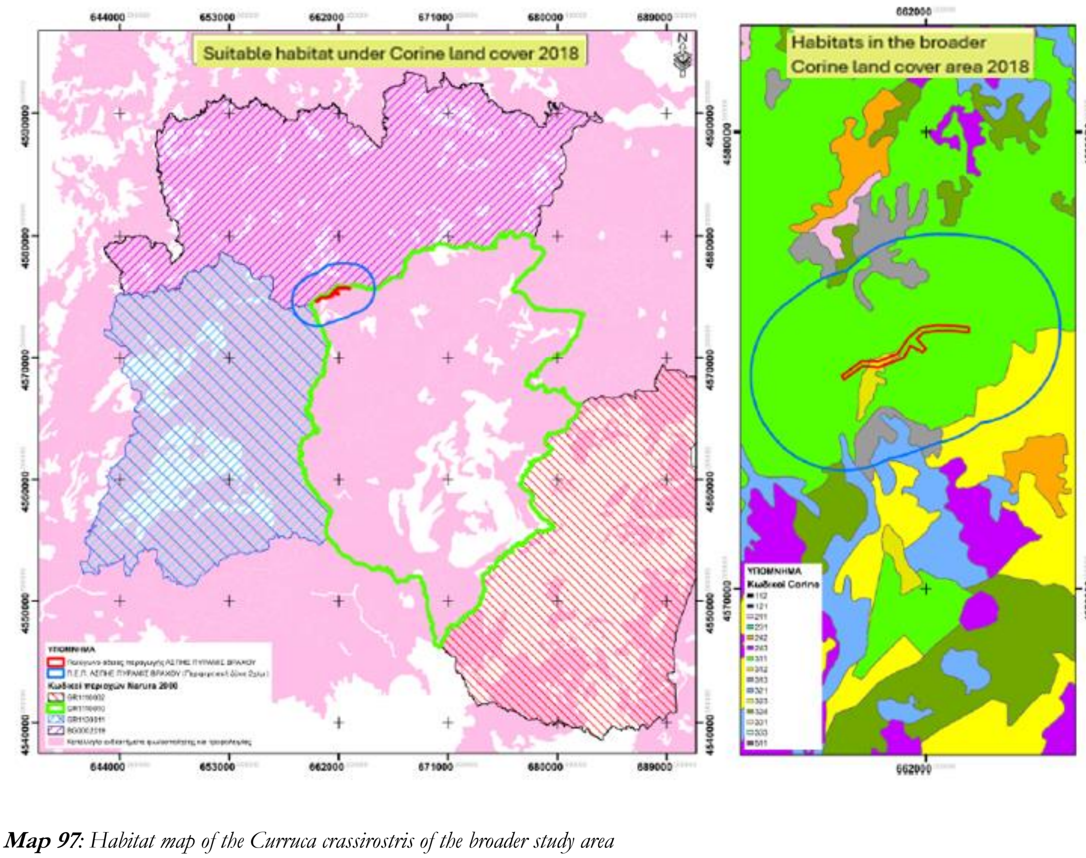
Map 94: *Distribution map of the Picus viridis in the broader study area*



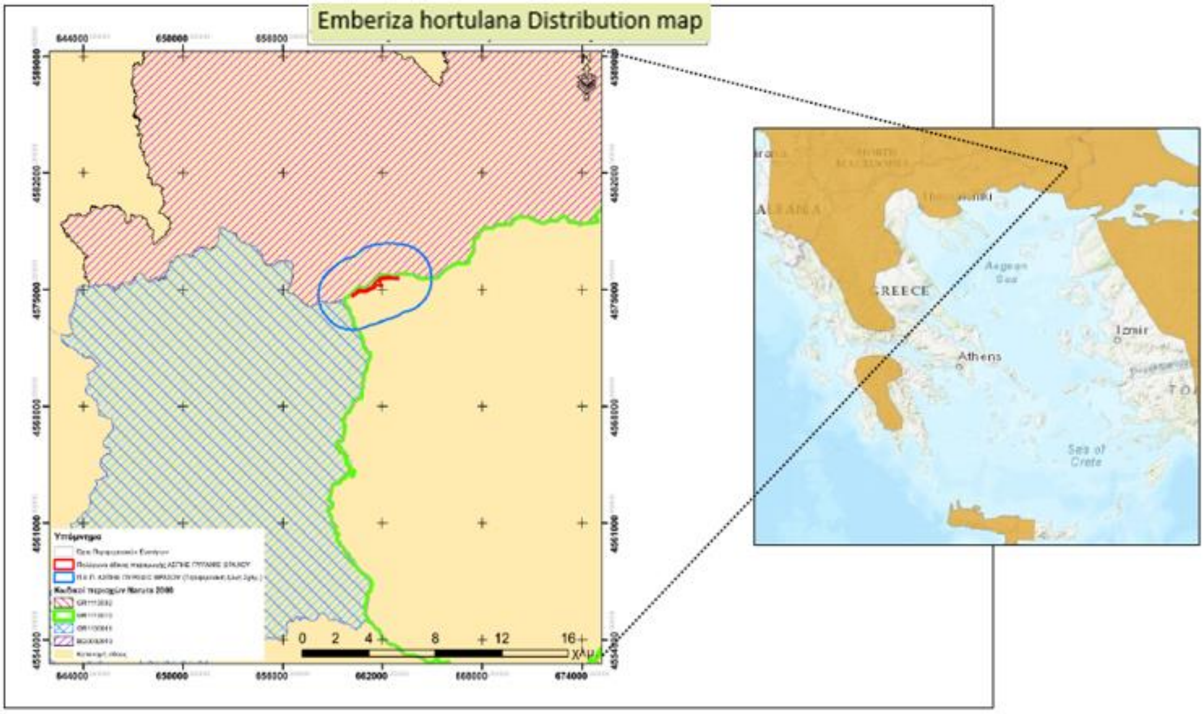
Map 95*: Habitat map of the Picus viridis in the broader area*



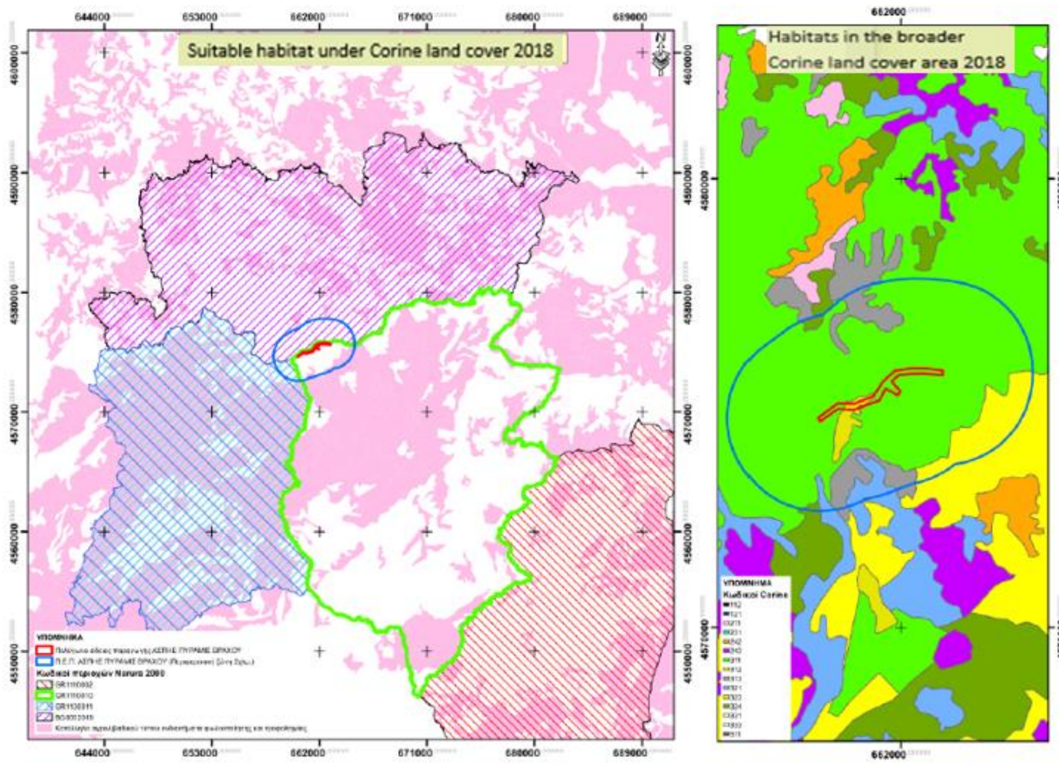
***Map 96**: Distribution map of the Curruca crassirostris of the broader study area*



***Map 97**: Habitat map of the Curruca crassirostris of the broader study area*



Map 98: *Map of the distribution of Emberiza hortulana in the broader study area*



Map 99: *Habitat map of the Emberiza hortulana in the broader study area*

ΥΠΟΜΝΗΜΑ=LEGEND

- Boundaries of regional units
- Production license polygons WPP Pyramis Vrachou
- Field Survey Area of WPP Pyramis Vrachou (regional zone 2km)
- open-type habitats suitable for feeding
- appropriate nesting and feeding habitats

Reference to other existing and/or approved projects or activities in the Study Area

The production license blocks of the project under study are located within a protected area of the Natura 2000 network of the broader region, as well as within an Important Bird Area of Greece. Furthermore, the production license blocks of the project under study are in an area with high wind potential which indeed has been classified as a Wind Priority 1 Area (Special Spatial Planning and Sustainable Development Framework for Renewable Energy Sources, Regional Units: Evros and Rodopi), with provision for the construction of up to 480 standard wind turbines. Therefore, due to the high potential of the broader area of installation, it has attracted investment interest in the development of wind farms. However, due to the significant potential adverse effects of wind farms in the study area, an effort is being made to properly locate and document the suitability of the installation location of wind farms, with the recent image from the geoinformation map of the study area (source R.A.E., available on 01/10/2024) including wind farms with installation license, operation license, production license and applications under evaluation. It is considered that mainly Wind Power Plants that have received an operating license, installation license and production license within a radius of 10 km are considered worthy of mention and examination. from the project under study. However, as recorded in the Table below, the projects that have taken a Decision for the Approval of Environmental Terms and the projects that are under public consultation in the Electronic Environmental Register are noted, since they are considered more mature. The projects with a Decision for the Approval of Environmental Terms are the HILL POULIA, AMMOUDA and TSOLIAS, while in public consultation in the Electronic Environmental Register are the projects ANEMONE, AGATHIS, PETOMENON AR. and LEFKI (source Electronic Environmental Register and aepo.ypeka.gr, available on 01/10/2024).

There are two wind farms in the wider area of the project site and within a 10 km radius, which is located west of the project under study at an average distance (in a straight line) of 2,18 km and 5,21 km (Map 100). The specific Wind Power Plants PATRIARCHIS and MIKRONOROS have a capacity of 46.3 MW and 33.60 MW respectively and consist of 34 and 8 wind turbines respectively (Source R.A.E., available on 01/10/2024).

Moreover, there are no wind power plants with an installation license in the wider area of the project and within a radius of 10 km. The nearest licensed wind farm is located at an average distance (in a straight line) of more than 100 km.

Finally, in the broader project area and within a radius of 10 km, the wind farms with a production license are listed in Table 15 and shown on Map 100.

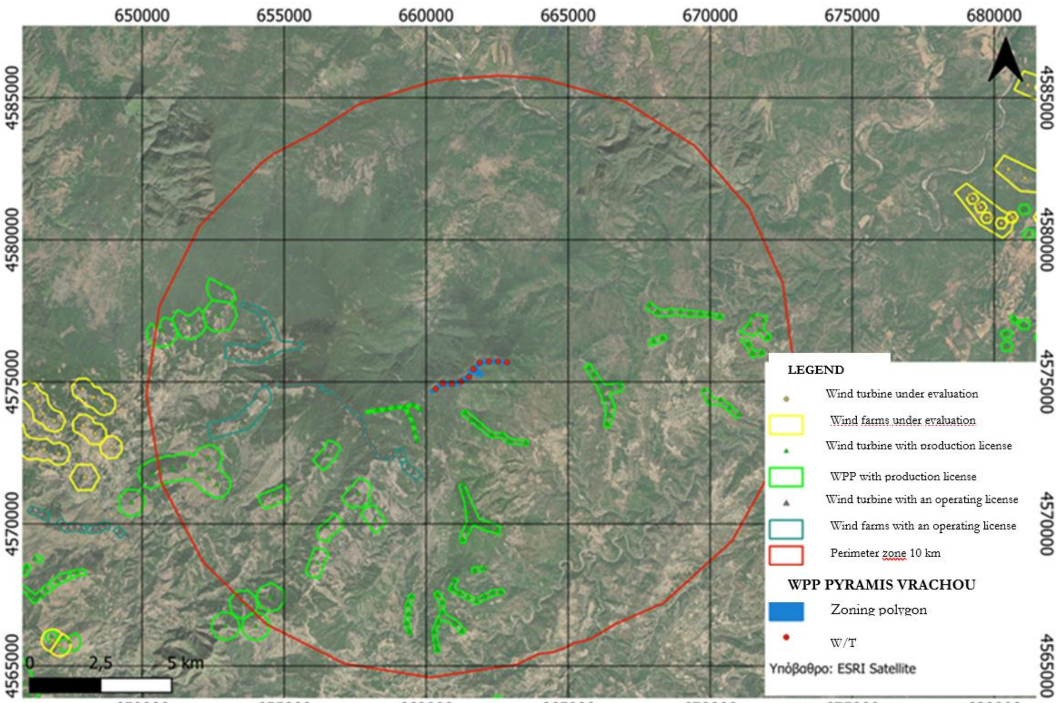
***Table 15**. Wind farms with production licenses in the project under study.*

Position	**No. Production Licence**	**Municipality**	**Power (MW)**	**Distance from nearest Wind Turbine of the project (km)**	**Status in the Electronic Environmental Register**	**Licensing Phase**
Anemoni	Γ-012363	Soufli	34,5	0,96	in public authority review	Production License
Pseftis	Γ-012430	Soufli	34,5	2,89	-	Production License
Drakos	Γ-12426	Soufli	34,5	3,56	-	Production License
Agathea	Γ-08027	Soufli	24,15	1,11	in public authority review	Production License
Petoumenon	Γ-08025	Soufli	31,05	6,98	-	Production License
Petoumenon	Γ-08029	Arrianon	17,2	7,18	in public authority review	Production License
Ailoti	Γ-012438	Soufli	34,5	6,5	-	Production License
Patriotis	Γ-08065	Arrianon	45	7,8	-	Production License
Lofos Poulia	Γ-06185	Arrianon	24	8,36	a Decision for the Approval of Environmental Terms has been issued	Production License
Ammouda	Γ-05447	Arrianon	36	3,93	a Decision for the Approval of Environmental Terms has been issued	Production License
Mavrodasos	Γ-08022	Soufli	34,5	8,97	-	Production License
Ammoudes	Γ-08020	Soufli	30	7,01	-	Production License
Lefki	Γ-08019	Soufli	34,5	5,41	in public authority review	Production License
Tsolias	Γ-05452	Arrianon	28,8	7,34	a Decision for the Approval of Environmental	Production License

					Terms has been issued	

Regarding the Wind Power Plants with a production license, there are 15 wind power plants (Source: R.A.E. available on 01/10/2024), which have a total capacity of 477.75 MW, and consist of 117 wind turbines. It is worth noting here that the wind turbines at the "Lofos Poulia", "Patriotis" and "Tsolias" sites, which consist of 17 wind turbines, are partially located within the 10 km radius area, with 12 of the 17 wind turbines located within this radius. Therefore, the total number of wind turbines to be implemented (licensing stage under production), within a radius of 10 km from the project under study, amounts to 117 wind turbines.

In the wider project area and within a radius of 10 km there are no wind farms with an application under evaluation (Source: R.A.E. available on 01/10/2024).



***Map 100**: Map of wind farms, with a production license, in the broader area.*

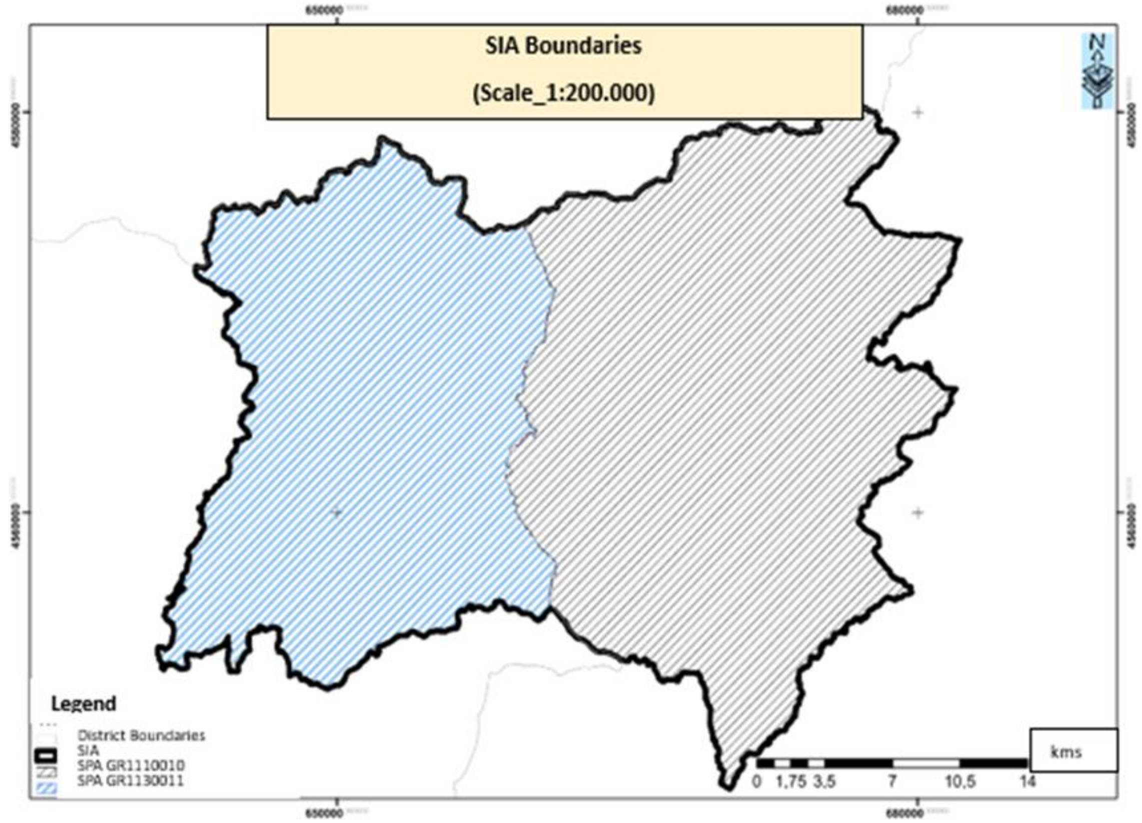
The synergistic effects of the installation of a project in an area result from the cumulative effect of all types of impacts of these projects and exclusively affect the avifauna of the area. According to the international bibliography and the Guidelines, synergistic effects can be considered at two levels. Projects located within a noticeably short distance and radius from the project under consideration (usually < 2 km) and those located over a larger radius and area (usually between 2 km and 10 km). The reason is that in the first case the project in question may be small in size with little or no impact on bird species, but within a short radius around it many other small or larger projects may be located and in total impact on species and in the second case, irrespective of the assessment of the project in question, numerous projects, irrespective of the size of the impact, may be located within a larger radius and multiply the impact of the project under consideration.

With regard to the protected areas under study, and in order to the synergistic effects of the project under study, it was chosen by the study team of this Special Ecological Assessment to consider the broader boundaries of the entire area enclosed within the main GR1110010, but also the closest Greek SPA GR1130011, as almost all of the already installed WPPs are located within it (operating license) in the wider area. Therefore, the area resulting from the merging of the boundaries of the two above-mentioned areas will henceforth be referred to as the 'synergistic impact study area' (SIA) (Map 101).

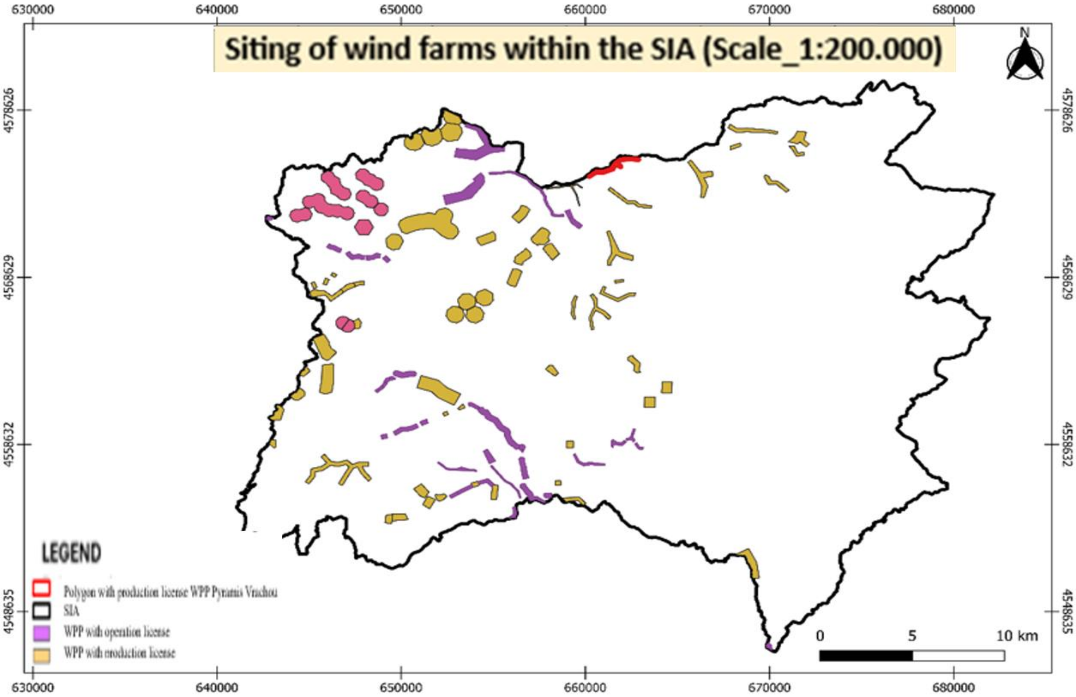
Therefore, within the SIA there are 14 Wind Power Plants (nine on-site and five partially on-site) that have been licensed (Map 102), which have a total capacity of 314.6 MW, occupying a total area of 1,092.99 ha (total area of polygons within the SIA - out of the five Wind Power Plants partially located within the SIA), only the area of the polygons located within the polygons was counted) and consist of 188 wind turbines. It should be noted that of the five Wind Power Plants partially located within the SIA (Wind Power Plants: MAGOULA KAZAKOU - DIPLON, SARAKATSANAIKA, MONASTERI II, GERAKI, FANTAROS) and consisting of 46 wind turbines, only 19 of them are located within the SIA. Therefore, the total number of wind turbines located within the SIA is 161 wind turbines.

As for the Wind Power Plants with a production license within the SIA, they amount to 45 wind power plants (including the one under study) in the licensing stage under production (production license) (Map 102). Note, due to the fact that of all of the above Wind Power Plants, some are partially located within or on the boundaries of the synergistic impact study area, both the area of the production license blocks of the above Wind Power Plants located within the SIA and the total number of wind turbines located within the SIA will be counted in the synergistic impact analysis and assessment. Thus, out of the total of 3,463.95 ha, an area which is the total of the production license blocks of the 45 Wind Power Plants (including the subject) located either within, or partially within, or within the boundaries of the synergistic impact study area, 3. 023,85 ha are located within the study area, while of the total of 160 wind turbines, which make up the above Wind Power Plants (including the seven wind turbines of the project under study), 146 are located within the synergistic impact study area.

As for the Wind Power Plants in assessment within the SIA, they amount to 4 wind power plants (Map 102). In this case, the wind power plants are located entirely within the SIA, have an area of 806.20 ha and consist of a total of 21 wind turbines.



Map 101: *Map of the boundaries of the protected areas under study GR1110010 and GR1130011, and boundaries of the synergistic impact study area (boundaries of the merger of the two protected areas)*



***Map 102:** Map of wind farm site siting within, partially within and on the boundaries of the "synergistic impact study area" (licensing stage in operation and under production)*

Other relevant information related to the Study Area

In this section, according to the specifications of the SEA, as defined in the 170225/20-01-2014 government ministerial decision (Government Gazette 135/B/27-01-2014), the designer may, at his/her discretion, mention general information about the study area related to works, studies, etc. that are a source of information about the study area and are available and were used during the preparation of the SEA, as well as any problems and difficulties that arose during its preparation and any assumptions and methods that were resolved.

Regarding the established SPA GR1110010, which is the main study area within which the project under study is located, according to the publication: *'Identification of compatible activities in relation to the species designation of Special Protection Areas for birds, Supplementary deliverable: National List of Special Protection Area Designation Species" with the contracting authority the Ministry of Environment and Natural Resources - Environmental Planning Directorate, Department of Natural Environment Management (Dimalexis 2010)",* and in accordance with the decision no. H.Π.8353/276/E103 (Government Gazette 415/B/23-

02-2012) the species of classification are *Aegypius monachus, Aquila pomarina (Clanga pomarina), Neophron percnopterus.*

In addition, according to the *"Ornithological Assessment Report of the area "GR003 Forest of Dadia - Deriou - Aisymi", for its designation as a Special Protection Area. Ministry of Environment, Spatial Planning and Public Works, Athens, and Greek Biotope/Wetland Centre (GBWC), Thermi. 31 p. + ii annexes." (Poirazidis 2005)*, species of delimitation for the area are: the *Ciconia nigra, Aquila chrysaetos, Circaetus gallicus and Hieraaetus pennatus*, as according to the above report, the area maintains, on a national level, a significant population of these species. According to the above source, for the species *Ciconia nigra* the area supports more than 4 % of the national population, for the species *Circaetus gallicus* the area supports more than 2 % of the national population, for the species *Aquila chrysaetos* the area supports 3-4 % of the national population and for the species *Hieraaetus pennatus* the area supports 6 % of the national population.

As regards the nearest Greek Natura SPA GR1130011, which is located at a distance of more than 500 m, according to the publication: *National List of Special Protection Area Designation Species" with the contracting authority the Ministry of Environment and Natural Resources - Environmental Planning Directorate, Department of Natural Environment Management* (Dimalexis 2010)", as well as in accordance with the decision no. Η.Π.8353/276/Ε103 (Government Gazette 415/B/23-02-2012), the species classified are A*egypius monachus, Aquila chrysaetos, Circaetus gallicus, Dendrocopos medius (Leiopicus medius), Dendrocopos syriacus, Emberiza hortulana, Ficedula semitorquata, Gyps fulvus, Lanius collurio and Neophron percnopterus*.

With regard to the established SPA GR1110002, which is located at a distance of approximately 20 km, according to the publication: *National List of Special Protection Area Designation Species" with the contracting authority the Ministry of Environment and Natural Resources - Environmental Planning Directorate, Department of Natural Environment Management (Dimalexis 2010)"*, and in accordance with the decision no. Η.Π.8353/276/Ε103 (Government Gazette 415/B/23-02-2012), the species designated *are Aegypius monachus, Aquila chrysaetos, Aquila clanga (Clanga clanga), Aquila pomarina (Clanga pomarina), Bubo bubo, Circaetus gallicus, Gyps fulvus, Hieraaetus pennatus, Hippolais olivetorum, Neophron percnopterus and Nycticorax nycticorax.*

In addition, regarding the above-mentioned Greek Natura 2000 sites under study, the drafting team of this Special Ecological Assessment chose it to present the most important species of the bird species of the above SPAs, as described in the 2019 edition of their Standard Data Forms (SDF) (End 2018_15/03/2019). The reason chosen by the drafting team of this monitoring project not to take into account the revised version of the SDFs consists both in the fact that the latter is included in full, without the slightest difference, in the version (2019) chosen, and in the existence of large birds of prey that, according to their ecology, are active over a large radius, capable of covering the distance to the study area. These important raptors (e.g. *Aquila chrysaetos, Clanga pomarina, Aegypius monachus, Gyps fulvus, Neophron percnopterus, Aquila heliaca, Buteo rufinus, Milvus migrans, Hieraaetus pennatus, Aquila fasciata, Circus pygargus, Falco biarmicus, Falco naumanni*) for which the above areas, as mentioned in previous subsections of this report, are very important, are not included in the latest version of the SDFs for the areas. Also, most of these raptors are also designation species of the above study areas. Furthermore, important Annex I species of Directive 2009/147/EK, such as *Ciconia nigra, Ciconia ciconia* etc. are not mentioned.

Also, as regards the neighboring Bulgarian Natura 2000 SPA BG0002019, many important big predators or other large species are included in its SDF, with many of them (*Aegypius monachus, Aquila heliaca, Clanga pomarina, Ciconia nigra, Circaetus gallicus, Buteo rufinus, Haliaeetus albicilla, Aquila fasciata, Hieraaetus pennatus, Neophron perncopterus*) being important species of the other Greek SPAs under study or species of designation or delimitation. Therefore, all of them together with the remaining important predator species of Annex I of the Birds Directive, listed in the SDF of the neighboring Bulgarian SPA BG0002019 (e.g., *Circus pygargus, Accipiter brevipes, Falco naumanni, Falco peregrinus, Falco vespertinus, Pernis apivorus*, etc.), have been included in the species of interest of this Special Ecological Assessment.

Also, as regards to the vulture, which is mentioned in the SDFs of some of the Greek SPAs under study, according to information from the Red Book of Threatened Animals of Greece, it is now only found in Crete (Legakis and Marangou 2009): *'The vulture is the rarest species of vulture in Greece and, unlike the others, it maintains territories and does not form colonies. In the past the vulture was a common species with a wide distribution and in the 1970s it spread to all the mountain ranges of the mainland and Crete, with a population estimated at 25 pairs (Handrinos 1985). In the mid-1990s the first population decline (12-18 pairs) was observed, coinciding with the reappearance of the wolf (Canis lupus) in several mountains of Sterea and Thessaly and the illegal use of poisoned baits for its control (Tucker and Heath 1994; Handrinos and Akriotis 1997; Sakoulis 2000). This downward trend continued throughout the 1990s, resulting in an 84% decline in the vulture* *population and a 75% decline in its distribution. In the mid-1990s, 4 pairs were left in Crete and a single individual in the mountain arc of Aridaia (Jena-Pinovo) in western Macedonia (Xirouchakis et al. 2001). Today the vulture is found only in Crete, with 4-6 pairs, which is the only breeding population in southeastern Europe, except Turkey (BirdLife International 2004; Xirouchakis and Tsiakiris 2008). The total population in Crete does not exceed 30 individuals, of which about 1/3 are immature (Xirouchakis and Tsiakiris 2008). A key characteristic of this population is the high number of dominations with solitary mature individuals (61%), as well as the early reproduction of sub-mature individuals, both samples of lack of adults due to high mortality (Xirouchakis and Grivas 2002).".*

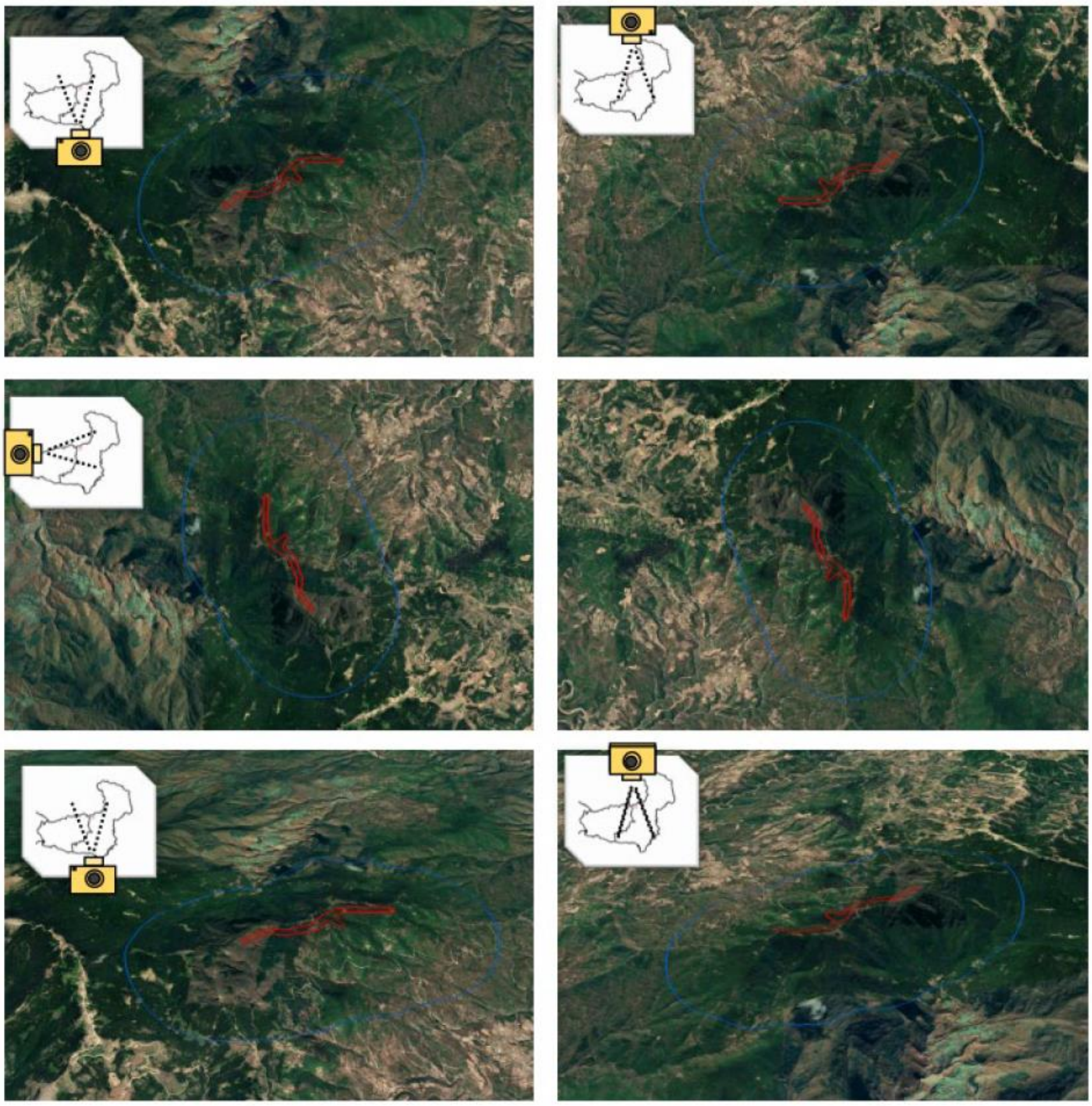
In addition, again according to the Red Book of Endangered Animals of Greece, and as far as the Eastern Imperial Eagle is concerned, it no longer breeds in Greece, and is a rare and local winter visitor, with an average of 6-10 individuals per year, mainly in the large wetlands of northern Greece (Evros Delta, L. Kerkini, Kalamas Delta etc.), while a few individuals, mainly juveniles, migrate south in autumn along the Ionian coast (Messolonghi, western Peloponnese etc.) (Chandrinos 1992, Handrinos and Akriotis 1997, EOE data) (Legakis and Maragou 2009): *"Common in Greece and widely distributed species in the pre-war years and until the 1960s, 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 nests (Handrinos and 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, in the large wetlands of northern Greece (Evros Delta, L. Kerkini, Kalamas Delta, etc.). A few individuals, juveniles, migrate south in autumn along the Ionian coast (Messolonghi, western Peloponnese, etc.) (Chandrinos 1992; Handrinos and Akriotis 1997; EOE data). There are 10 recoveries in Greece of ringed individuals in Hungary (5), Slovakia (4) and Bulgaria (Akriotis and Chandrinos 2004).".*

The production license polygons of the studied WPPs are in an area designated as Wind Priority Area 1 (Special Spatial Planning and Sustainable Development Framework for Renewable Energy Sources, Regional Units: Evros and Rodopi), with provision for the construction of up to 480 standard wind turbines.

Finally, the available literature did not reveal any record of nest existence, regular use or breeding activity for the important bird species.

Photographic documentation

In order to better visualize the location of the project from characteristic points of the immediate and the wider area and to create a complete image of the surrounding area of the production license polygons of the project under study, it was chosen to render the mapping of the area from a combination of satellite images, so that within them there are georeferenced and the production license polygons and the peripheral zone of 2,000 meters that defines the maximum of the wider area of recording natural environment data (field survey area) (see however the relevant references in the Field Survey Area section, Section 5) and aerial photographs. Both the immediate and the wider project area are then presented in photographs (satellite image extracts) from the four different locations (shooting orientation B, N, A, Δ) with associated shooting orientation indication in the orientation map insert within each photograph.



***Photos 1 to 6**: Photographs (satellite image sections) with georeferenced polygons of the wind farm production license (red) and the field research area (blue), taken from different directions of the horizon in vertical projection (top and middle), and taken from the south and north directions at an angle of view (bottom left and bottom right respectively).*

Aerial photographs of the site of the project and the broader area








***Photos 7 to 26**: Aerial photographs of the project area and the broader area, taken from different altitudes and from different horizon directions to better capture the broader study area.*

Conducting a Preliminary Check (screening)

At this point, after the collection and presentation of the necessary information about the Study Area and before the analysis of the necessary of the Field Survey Area, the section of the preparation of the preliminary audit, in which in essence a first assessment is made the likelihood that the installation of the project will result in adverse effects on the GR1110010 and the GR003 IBA, as well as to the nearest SPA GR1130011, GR1110002 and BG0002019, as well as the nearest SPA GR1130011, GR1110002 and BG0002019 GR008, whose object of protection is avifauna, so that to determine the need for further investigation of the impacts through necessary due assessment.

From all of the above data presented in previous sections of this Special Ecological Assessment, in the most detailed way, those species listed as characterization and delimitation species of the GR1110010 SPA and the characterization species of the GR003 SPA within which the project under study is located were selected for further analysis. In addition, the designation species of the nearest Greek SPA GR1130011 and the nearest IBA GR008 were selected for further analysis. In addition, all of the large and non-predatory species (as well as the white-headed starling and eagle owl) of Annex I of Directive 2009/147/ EK, included in the STANDARD DATA FORM of both the two aforementioned study SPAs and the two remaining study SPAs, the neighboring Bulgarian study SPA BG0002019 and the more remote SPA GR1110002, were selected.

Therefore, the total of 46 species analyzed below, and henceforth referred to as species of "interest", consists of (listed by their new IUCN Latin names): Dendrocopos syriacus, Emberiza hortulana, Ficedula semitorquata, Accipiter brevipes, Buteo rufinus, Clanga pomarina, Ciconia nigra, Circaetus gallicus, Hieraaetus pennatus, Neophron percnopterus, Pernis apivorus, Aquila chrysaetos, Haliaeetus albicilla, Aegolius funereus, Bubo bubo, Falco naumanni, Falco peregrinus, Falco columbarius, Gyps fulvus, Aegypius monachus, Clanga clanga, Leiopicus medius, Lanius collurio, Emberiza caesia, Hippolais olivetorum, Strix aluco, Curruca crassirostris, Curruca melanocephala, Curruca cantillans, Phylloscopus orientalis, Picus viridis, Sitta neumayer, Oenanthe hispanica, Emberiza melanocephala, Aquila heliaca, Milvus migrans, Aquila fasciata, Pandion haliaetus, Circus aeruginosus, Circus cyaneus, Circus pygargus, Circus macrourus, Falco eleonorae, Falco vespertinus, Milvus milvus, Ciconia ciconia.

As already mentioned, the potential impacts of the installation and operation of WPP on avian populations are divided into impact mortality, which concerns the operational phase of the project and for which the magnitude of the impact on the installed turbines or on the energy transmission network is assessed, direct habitat loss, which relates to both the construction phase and the operation phase of the project and essentially assesses the magnitude of the impact of direct habitat loss of important bird species on their populations, and disturbance and movement barriers, which relates to both the construction phase and the operation phase of the project and is assessed on the basis of an assessment of the magnitude of the impact on populations living for at least some period of time (breeding, wintering, feeding area) in the area.

According to the above data and considering that the project under study for the installation of the WPP at the "Pyramis Vrachou" site is a project that will be installed within habitat types that are abundant in the area, it is estimated a priori that the most significant potential impact to be investigated relates to impact mortality. No direct habitat loss is expected to occur as the availability of similar habitat to existing habitat in the area is high. According to the database and land cover mapping (Corine land cover 2018) reflected on the documentation maps, the area of the WPP Pyramis Vrachou production license blocks is located within an area of natural grassland, hardwoods, and broadleaf forest (see documentation map section, Map 7). The above habitat types also cover most of the field research area of the project under study, with the habitat mosaic complemented by areas of land used for agriculture along with significant areas of natural vegetation, areas of coniferous forest, mixed forest and transitional woodland and scrub. In general, the above habitat types predominate in the area.

From the above information the construction and operation of the project is unlikely to result in significant impacts with respect to the objectives, protected objects, conservation status and integrity of the study area. As noted above, the habitat types occupied by the production permit polygons of the study project abound in the study area and outside the study area, and therefore it cannot be assumed that the study project will cause dispersal, fragmentation, or any form of significant habitat loss.

Also, as in any project constructed within forested areas, the restoration of the intervention areas is foreseen (at the completion of the works, the slopes of roads and squares will be restored and at the end of the life of the project all disturbed surfaces will be restored). It is worth noting here that the intervention within the production license blocks of the studied WPP will be much less, since it will mainly concern areas within them that will be used for the installation of the wind turbines (foundations of the wind turbines, infrastructure works, etc.), while the opening of access roads will be limited due to the existing road network of the wider installation area and will essentially be limited to sections of new openings to connect the existing network to the wind turbine sites. The area that will remain free of vegetation during the operation of the Project consists of areas with a total area of 71,056.36 square meters or 44.31% of the total area of the Project. This area has been calculated as the difference between the area of occupation and the roadway of the access roads and wind turbine installation sites. It should be noted that the area will be restored after the project is completed. The disturbed area of 89,296.69 m2, or 55.69% of the total area of the Project, is obtained by adding the areas of the access road pavements and the wind turbine construction areas. Moreover, the impacts on the natural environment from the electrical interconnection projects of the WPP (voltage step-up substation and high and medium voltage lines, as well as the transmission lines), are minor and are mainly limited to the construction phase, and regarding specifically the power transmission lines, in this SEA it is proposed to be installed underground and up to the substation, so as not to cause any negative impact on the avifauna of the area. Finally, the wider area of the project under consideration is not fenced and the disturbance is of short duration and intensity and reversible after the completion of the construction works.

Nevertheless, the assessment of the impact of the project's impact on habitats has been carried out by considering the entire area of the ERA polygon and not the necessary occupation zone, which is much smaller (approximately 5-10% of the RAE polygon), assuming the strictest approach, so as not to underestimate the impact of the project, as will be discussed in the next chapter.

Also, to ensure that the significance of disturbance during the construction phase is limited, it is proposed that construction will take place outside the breeding season of the fauna in the area (March - June).

Based on all the above mentioned, it is demonstrated by the existing studies and scientific publications concerning the broader study area that given the location of the site of the WPP under study, there is no risk that the installation and operation of the above wind farm will have a negative impact on the protected areas and their protected objects, which are primarily large birds of prey - scavenging birds.

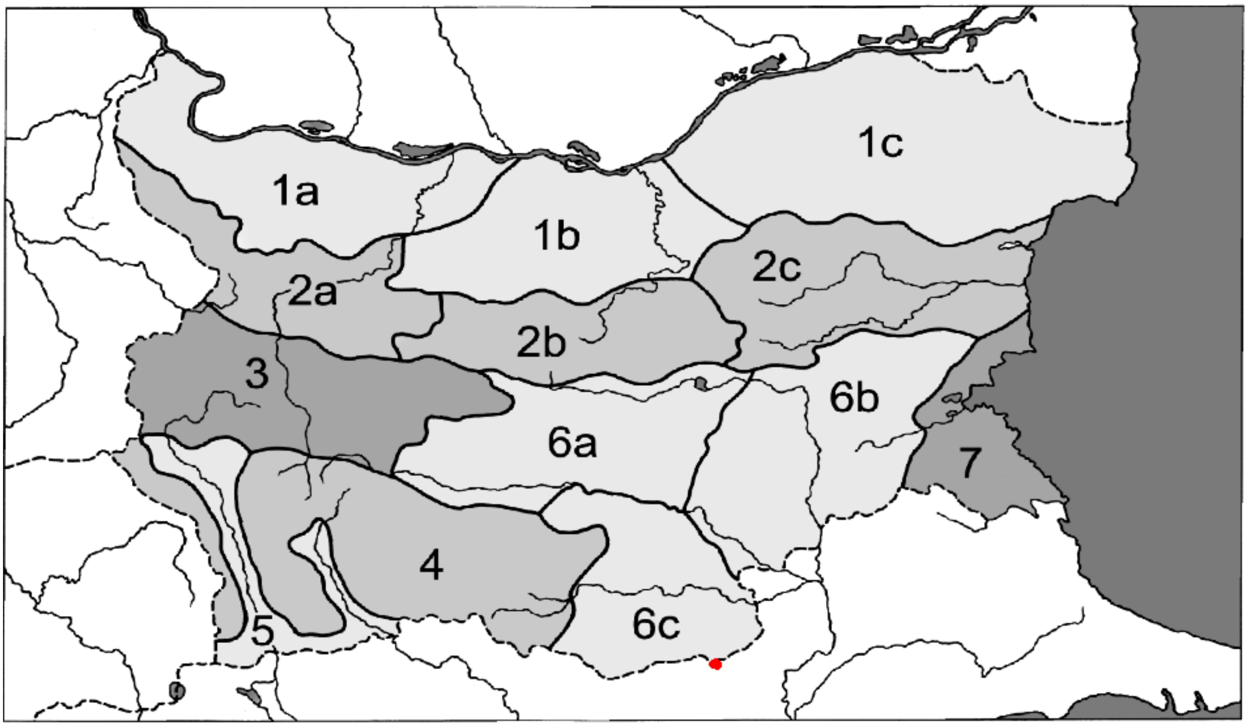
Regarding handrails, the literature review shows that the closest location for them is more than 25 km away. According to the LIFE GRECABATS project, the 230 most important bat sanctuaries in Greece (caves, mines, buildings, etc.) and caves as habitats of Directive 92/43/EEK (8310: Caves not used for tourism) were selected to be proposed as protection sites by the specific Environmental Studies and the following Management Plans. The main criteria for their selection were the number of species and colony sizes of cephalopods and the number of typical species and narrowly endemic species of invertebrates for the 8310 habitats. The proper management of most of the Annex II species of chrysoptera of the Habitats Directive, but also of cave colonies and their other typical and important species, requires proper management of the surrounding area. This space feeds the chironomids, but also determines the availability and quality of organic matter and water inside the bedrock and caves and plays a key role in their microclimate. Based on the above, protection areas around each location of important caves were designed and proposed by the above project. Of the above designated important caves and protection areas around them, it was found that none were located within the field research area, nor near it. In fact, the nearest site is located at more than 25 km, as mentioned above. More specifically, the nearest corresponding site is located at an average distance (in a straight line) of 25,25 km south-southeast of the project under study and is the site of the 'Dadia Mines' (Map 107).

Regarding Bulgaria, it covers the central and eastern part of the Balkan Peninsula and from a biogeographical point of view, it presents a broad transition zone between Mediterranean tree forests and European mixed forests of south-eastern Europe. Bulgaria's terrain includes a wide mosaic of habitats, from semi-arid steppes and coastal scrubland to forests and alpine meadows in its high mountains. It lies in the zone of the Mediterranean subtropical climate gradient (which affects the southern part of the country) and temperate climates, with maximum rainfall in spring and autumn. It is bordered by the Black Sea in its eastern part, the Danube River and the Danubian plains in the north, which complete the diversity of the country's topography. About a quarter of the total area of the country is in the semi-mountainous zone and above, while at the same time in the eastern and northern parts of the country are at sea level. The effect of this highly varied altitudinal gradient, the mosaic of habitats and the extensive dominance of carbonate rocks results in a highly varied karstic landscape. This landscape covers about 23 % of the country and often takes the form of large rocky crags and spacious natural caves (over 4200 caves are known in Bulgaria). The unique geographical location, the diverse topography and climate, as well as the highly structurally diverse landscape, constantly influenced by post-neolithic anthropogenic rearrangements, set the pattern for remarkably high biodiversity (Sakaljan and Majni 1993). This fact also leads to the wide variety of chiral species found in the country. The amount of information on the distribution, fauna, and classification of bats in Bulgaria is much greater than in any other country in the south-eastern Mediterranean and south-eastern Europe in general. In Bulgaria, there are species of wrens typical of the mixed forests of central and northern Europe, species of wrens which are mainly found in the Mediterranean with Bulgaria being the northernmost part of their distribution range, but also species of wrens which, due to their distribution and basic ecological requirements, are intermediate transition between the two above mentioned categories.

According to Benda et. al. 2003, who compiled a complete list of all bat species recorded in Bulgaria, based on both literature and field data, at least 32 bat species have been recorded in 2. 127 sites in Bulgaria, including 12 species listed in Annex II of Directive 92/43/EEK, which are listed in the TDB of the adjacent Special Conservation Area (SCA), the Bulgarian Natura 2000 network site BG0001032.

The species of fauna and flora listed in Annex II to Directive 92/43/EEK are the protected species of the Special Conservation Areas of the Natura network. This Natura 2000 network site is the closest SCA to the project under consideration, within the TDB of which Annex II species of Annex II to the above Directive are listed. The 12 species of arthropods listed in Annex II to Directive 92/43/EEK, which are listed in the TDB of the neighboring Bulgarian SCA BG0001032, are: Barbastellus barbastellus, Miniopterus schreibersii, Myotis bechsteinii, Myotis blythii, Myotis capaccinii, Myotis emarginatus, Myotis myotis, Rhinolophus euryale, Rhinolophus ferrumequinum, Rhinolophus hipposideros, Rhinolophus mehelyi, Rhinolophus blasii.

A map of Bulgaria is given below (Map 103, Source: Benda et al. 2003), subdivided into seven main areas, delimited in relation to the vegetation maps of the Balkan Peninsula (Horvat et al. 1974, Bondev 1991, Velčev 2002) and modified in relation to the traditional zoogeographical subdivision of the Bulgarian territory (Drenski 1966, Georgiev 1982, Hubenov 1997), as well as Table 16, within which the records of 12 species of chironomids are shown, which are also listed in the TDB of the neighboring SCA BG0001032.



***Map 103**: Map of Bulgaria, showing the subdivision of the country into biogeographic regions. The red outline shows the georeferenced production license polygons of the project under study.*

***Table 16**. Part of a table showing the number of records of the 12 Annex II species of the Annex II of Directive 92/43/EEK listed in the TDB of the SCA BG0001032, in individual biogeographic sites in Bulgaria (Source: Benda et al. 2003)*

Species	1a	1b	1c	2a	2b	2c	3	4	5	6a	6b	6c	7	Total

Rhinolophus ferrumequinum	11	24	21	85	17	16	18	37	14	1	5	28	19	296
Rhinolophus hipposideros	6	17	15	82	15	12	20	38	18	2	5	27	16	273
Rhinolophus euryale	3	13	5	32	4	12	3	5	7		3	8	9	104
Rhinolophus mehelyi		5	5	3	1	5			1		3	5	1	29
Rhinolophus blasii		4	2	24	1	2	5	3	3		2	9	5	60
Myotis myotis	9	14	11	62	8	15	10	25	6	2	2	16	4	184
Myotis blythii	1	10	8	36	5	10	7	22	5	1	2		9	116
Myotis bechsteinii		1		11	3	2		4	1		1	2	2	27
Myotis emarginatus		10	3	17	5	5	1	13	5		3	3	6	71
Myotis capaccinii	3	14	6	26	4		3	5	2		3	8	5	79
Barbastella barbastellus		1		3	5	1		8	1	1		1	2	23
Miniopterus schreibersii	5	22	15	48	9	24	13	11	2	1	4	7	13	174

As shown in Table 16 above, sub-area 6c, which is most adjacent to the study project site, contains the fourth largest number of sites in the whole of Bulgaria in terms of the 12 species of handicap species of interest (114), however 48% of these (55 sites in total) are Rhinolophus ferrumequinum and Rhinolophus hipposideros, which according to the same source, are the most abundant bat species in Bulgaria. These two species have been found at more than 270 sites and represent 27.1 % of all bats recorded in Bulgaria (Benda et al. 2003).

Furthermore, the central part of sub-area 6c includes the Arda River valley, while its south-eastern boundaries include the Byala and Luda River valleys, and adjacent to the Greek-Bulgarian border are the higher Gumurdjinski Snejnik and Muglenik hills with well-preserved and mature oak and beech forests. These habitats are suitable and particularly important for bats (wetlands, water bodies and streams) (Limpens et al. 1989; Limpens and Kapteyn 1991; de Jong 1995; Verboom and Huitema 1997; Walsh and Harris 1996a, b; Kelm et al. 2014). The project under study is more than 25 km (in a straight line) from the Arda River. (from its nearest limit, which is located northwards within the Bulgarian territory), and most of the recording sites of these 12 species, according to the same source, are located on both sides of the Arda Riverbed.

Another numerous group of species with 174 and 184 sites respectively includes Miniopterus schreibersii and Myotis myotis (together 17.1% of all bats recorded in Bulgaria). The four species mentioned above are cave species, forming numerous colonies in caves, and can be considered as the most numerous species in the country. They are also the only ones found in all 13 biogeographic sub-regions of Bulgaria. Rhinolophus euryale, Myotis blythii, Pipistrellus pipistrellus, Nyctalus noctula and Plecotus austriacus can also be considered abundant, according to the same source (the latter three are not mentioned in the section of the table above, as they are not species listed in Annex II of Directive 92/43/EOK but are not mentioned in the SDF of the Bulgarian SAC BG0001032). The above-mentioned species Rhinolophus euryale and Myotis blythii have been found in 104 and 116 sites respectively, and together with species, Pipistrellus pipistrellus, Nyctalus noctula and Plecotus austriacus represent 24.1% of all bat records in Bulgaria and have been found in 12 out of 13 biogeographic sub-areas of the country.

All the above species are the dominant bat species in Bulgaria, accounting for 68.3% of all records.

In addition, a group of relatively numerous bat species includes Rhinolophus blasii, Myotis emarginatus, Myotis capaccinii, Eptesicus serotinus and Hypsugo savii (the latter three are not mentioned in the section of the table above, as they are not Annex II species of Directive 92/43/EOK but are also not listed in the SDF of the Bulgarian SAC (BG0001032). All species in this group were found at 60 to 80 sites (60 for Rhinolophus blasii, 71 for Myotis emarginatus, 79 for Myotis capaccinii) per species of interest and represent (all five) 17.1% of all bat records in Bulgaria.

All the species mentioned above are distributed throughout Bulgaria and, except for P. pipistrellus and N. noctula, belong to the Mediterranean species (M. capaccinii was included in this group with some reservation). The remaining 17 species (a total of only 14.6% of bat records in Bulgaria) were found in isolated areas at less than 40 sites (1-36). This group includes species found in northern and central Europe (Myotis bechsteinii, M. nattereri, M. brandtii, M. daubentonii, Barbastella barbastellus and Plecotus auritus), the Mediterranean species (Rhinolophus mehelyi, Myotis aurascens, Pipistrellus kuhlii and Tadarida teniotis), and the migratory species (Vespertilio murinus, Pipistrellus nathusii, Nyctalus leisleri and Nyctalus lasiopterus).

Considering all the above stated, it is concluded that there is no significant risk that the installation and its operation will have a negative impact on the protected area within it is located, but also, more generally, on the neighboring protected areas of the wider area of its installation, on their conservation objectives and on their protected objects.

However, due to the sensitivity and importance of the broader study area, the intention of the study team to further evaluate the project site to assess whether, despite the above, mitigation measures are required to address potential impacts that will be caused and to propose a proper monitoring plan during the construction and operation phase of the project, it is considered that there should be further investigation with the preparation of the next step of the SEA (and the examination under Article 6(3-4) of Directive 92/43/EOK) including an appropriate assessment based on detailed and specific field survey data.

RESEARCH FIELD AREA (R.F.A)

Detailed description of the Research Field Area (R.F.A)

The area of investigation was defined as an area of 2,000 meters radius from the boundaries of the production license polygons of the project under study, much larger than the one defined as a minimum (specifically four times larger than it) in the SEA preparation specifications in 170225/20-01-2014 ministerial decision (Government Gazette 135/B/27-01-2014) for projects and activities of Category A2, which are implemented within the SPA. In practice, observations and recordings were conducted at a much larger radius, since, for example, from the viewpoints the observation of birds of prey could be conducted at even more than 5,000 m (using a telescope). The total number of bird sampling points is shown on maps 104 and 105, where the above is also presented on a satellite image background in the documentation maps section.

The proposed WPP in the location "Pyramis Vrachou" is proposed to be installed in the Municipality of Soufli, in the Regional Unit of Evros, by the company NIKI WIND POWER SINGLE MEMBER PRIVATE COMPANY, at an average distance (in a straight line) of more than 50 km north of the city of Alexandroupolis. The project has been granted a production license and includes 10 wind turbines with a total installed capacity of 34,5 MW (individual capacity of each wind turbine 3,45 MW), type VESTAS V117 - 3.45, with a rotor diameter of 117 meters and a hub height of 91,50 meters.

6. Field Research and Impact Assessment

Prior to fieldwork, the available published literature for the area and any available unpublished reports were collected. The information presented in these sources was then evaluated and combined with the data collected to prioritize the fieldwork in terms of species and sections of the study area.

The nomenclature of the IUCN and the classifications of the Red Book of Threatened Animals of Greece, the IUCN Red List and the Appendices of the International Conventions were followed for the identification and recording of the priority species of interest.

Given the large number of bird species of different orders, families, seasonal occurrence, distribution, habitat preferences and ecological requirements that are likely to be active in the wider study area of the project, it was considered necessary to group them into sets that could be scientifically treated as a group and to compile corresponding field record forms.

Organization of sampling sites by bird species group in accordance with ecological requirements and habitat suitability

Considering the grouping of bird species and their recording protocols, the selection of sampling sites within the boundaries of the research area was made considering:

- The ecology of the species within these habitats
- The historical occurrence data of the species
- The accessibility of the sites and the time of approach
- The establishment of a permanent sampling network to allow for comparable data in the future.
- The location of wind turbines
- The habitat types occurring within the field research area and the stratified selection of sampling plots (except for point survey stations from observation points - see sampling methods)

Timing of measurements and method analysis

A total of 28 days were spent in the field to implement the observation program. Specifically, observations were made by two team observers on two days in July 2020, two days in August 2020, two days in September 2020, two days in October 2020, two days in November 2020, two days in December 2020, two days in January 2021, two days in February 2021, three days in March 2021, three days in April 2021, three days in May 2021, and three days in June 2021. All fieldwork involving bird surveys (diurnal and nocturnal and incidental other fauna) was conducted on the above field days. They also include hours spent by study team researchers observing behavior and locating potential raptor nesting sites and critical habitat.

The planning of the field research took into consideration: the number and populations of species that the area hosts, the degree of adequacy of the available ornithological and other faunal data from literature reports and previous relevant studies that preceeded the area, complete or reconnaissance in previous years that enriched the knowledge and experience of the scientific research team for the area concerned, the size, topography and accessibility of the area, the homogeneity, extent and diversity of the habitat, and the number of species in the area.

For the needs of field research, data collection and visualization, appropriate equipment was used, consisting of:

- Four-wheel drive vehicles
- Maps of the area
- 10 x 50 dioptres
- Telescopes 20 x 60
- Positioning devices (GPS)
- Laptop and tablet computers
- Suitable GIS software
- High brightness lenses
- Digital cameras
- Portable CD players with speakers, etc.
- Digital rangefinders.

According to the international literature and the study of the Ministry of Environment and Natural Resources "Monitoring and assessment of the conservation status of avifauna species in Greece" (Vlachos et al. 2014), but also to the extent and nature of the study area, the proposed fieldwork for the recording of avifauna species was carried out using a combination of the following methods per bird group:

GROUP A: Predators (suitable methods for recording aquatic birds, waders, large waders, and seabirds likely to pass through the area)

1. Recording by the method of point recording stations from observation points

2. Recording of nocturnal birds of prey using the method of point recording stations and the reproduction of sound recordings

3. Recording of Nightjar by the method of linear car routes (synergy of sampling during movement between point recording stations of nocturnal predators).

GROUP B: Passeriformes, Picidaefromes, Coraciiformes, Apodiformes, Cuculiformes, Columbiformes, Galliformes, Pteroclidiformes, etc.

1. Recording by the method of point recording stations by direct observation and by ear,

2. Recording by the method of linear paths step by step

Additional care was taken to find nesting sites of birds of prey in suitable habitats in the study area and if a nest is found, its location is recorded, and the recording is evaluated accordingly. For the above task, field hours were dedicated on all days of the months within the breeding season by the study team, with scanning of the area to find nests, observation from view sites to detect behavior indicative of breeding-nesting by raptors (in-flight transport of nesting materials, food, etc.), gradual movement of the researcher to the nearest point in the direction of the path of the raptor exhibiting breeding behavior until the nest is found, etc.

In addition, during the night survey of nocturnal raptors, during the migration periods, staying in the field at each selected site was extended for the purpose of night observation and possible recording of nocturnal migrating birds, when lighting conditions (moon phase - cloud phase) allowed it.

The methodologies applied above are the most appropriate for the mentioned bird groups, based on the international literature and according to the study of the Ministry of Environment and Natural Resources "Monitoring and assessment of the conservation status of avifauna species in Greece" (Vlachos et al. 2014).

In greater detail:

Raptors (also suitable for aquatic, wading birds, large wading birds and seabirds likely to pass through the area)

- **Vantage Point-count Stations (VPCS)**

Counting from fixed vantage points of good surveillance height by macroscopic observation (binoculars and telescope) of a large part of the study area, preferably 360° circumference. The two most suitable sites were selected for the area, as indicated by a yellow triangle on the relevant maps (relevant maps section). The locations were chosen to obtain the best coverage around the perimeter of the location of the tested WPP. The recordings were mainly made in the morning and at noon (always at least one hour after sunrise). The researcher used binoculars and a 20x60 spotting scope. In this method the recording is done by using both means of macroscopic observation. In addition, he had a GPS device for precise positioning and several sheets of paper with the appropriate recording forms in a special folder, in which the basic data of the station for each sampling area, such as altitude, coordinates, site name, code of the sampling area, number of visits to the sampling area and the observer's full name were filled in beforehand. The researcher also carried a temperature measuring device, a clock-timer, and a bird identification guide. To conduct the surveys, the researcher took position at the station by placing the ground telescope at a fixed point that allowed for a full 360° rotation of the telescope. He scanned the area with both binoculars and the telescope and recorded the predators he spotted over a period of three hours. The researcher scanned the entire area around him at a 360° angle for 30 consecutive minutes, followed by a rest pause for a few minutes, and then he started the same procedure again. All species detected were recorded on the corresponding recording form.

- **Point Recording Stations with audio call playback and recording of the species Nightjar.**

Counting from fixed points by playing an audio call and recording the call-response. It is applied especially to nocturnal predators.

Two point-counting stations with sound call reproduction were selected in the study area, as indicated on the relevant maps (relevant map section) with blue circles (and with a white circle on the corresponding map with satellite image background). At each station, sound records of calls of nocturnal predators were played back in a specific way (in ascending order according to the size of nocturnal predators) and then their responses were recorded accordingly. The above method has been effective both in closed habitats with dense vegetation and in open habitats with low vegetation. The method involves recording a set of species of nocturnal birds of prey belonging to the order Strigiformes and the families Tytonidae and Strigidae. From the sound recording stations for the recording of nocturnal predators, individuals of nightjars shall be recorded by ear, as well as at any point where they are visually confirmed on the linear routes and especially during movement between the above stations during the night. The main researcher equipment in this case was an audio file on a CD, written in a specific way to ensure that there was proper sequencing between the audio files and the correct time gaps between playbacks. The researcher also carried a hand-held GPS device, a binder with several sheets with the appropriate recording forms, a temperature measuring device, a clock-timer, and a voice guide for bird identification.

To conduct the recordings, the researcher turned off the car's engine and after preparing the recording form, waited silently for 2 minutes. Then, he reproduced the voice of a nocturnal predator species for 20 seconds, followed by a one-minute pause, and repeated the procedure for 2 more times. In this way, for each nocturnal predator species, there was 1 minute of total playback call and 3 minutes of pause, while recording responses (responsive listening). The playback of the sound files started with the smallest species and continued until the largest species.

Methods for Passeriformes, Picidaefromes, Coraciiformes, Apodiformes, Cuculiformes, Columbiformes, Galliformes, Pteroclidiformes, etc.

- **Point Count Stations**

Counting from fixed points, within a certain radius around them using both macroscopic observation (mainly with binoculars where required) and species identification by ear. Six corresponding sites were selected in the field research area, as shown on the relevant maps (relevant map section) drawn with green circles per station. The method is effective both in closed forest ecosystems of dense vegetation and in open habitats of lower vegetation. Recordings were started, on a case-by-case basis, 15 minutes before sunrise and the study team attempted to finish with them before noon. The researcher was equipped with binoculars and a 20x60 telescope (binoculars were mainly used). In this method the recording relied heavily on hearing as well. Each researcher also carried a hand-held GPS device, in a special folder of several sheets with the appropriate recording forms, a temperature measuring device, a clock-timer, and a bird identification guide. To make the recordings, the researcher calmly approached the PCS and took a position in the center of the imaginary circle of 100 m radius. Initially, he waited quietly for 2 to 3 minutes, so that in case his arrival affected some species of passeriforms, they would return to their previous state. Then, a recording of the species of passeriforms was carried out as described below for a total of 7 minutes. A total of 3 minutes of stopping and 7 minutes of recording was required at each station, for a total of 10 minutes of total stay. Species that flew at a height greater than that of the tree crown were recorded as "fly over". If species were observed flying above the sampling area during the observation time, when they did not stop, they were recorded as independent "fly over", while if they stopped within the observation habitat the cross-section was recorded as dependent "fly over".

- **Foot Line-transects.**

Counting during the implementation of identified terrestrial routes of a specific length, using both macroscopic observation (binoculars) and species identification by ear. The transects cross parts of the species' habitats in the study area sampling plots and are implemented on foot. Three corresponding linear transects were installed in the study field research area and are depicted in blue on the associated maps [relevant map section]. Recordings were started, on a case-by-case basis, 15 minutes before sunrise and the study team attempted to finish with them before noon. The researcher used binoculars while identification was also done by hearing. Each researcher also carried a handheld GPS device, a special binder with several sheets of paper with the appropriate recording forms, a temperature measuring device, a clock-timer, and a bird identification guide. Each installed transect was 500m long. To carry out the recordings, the researcher took position at the beginning of each transect and was initially silent for 2 to 3 minutes, so that in case his arrival had affected some species of passeriforms, they would return to their previous state. He then carried out a census of the passeriforms species as described below until the end of the transect crossing. The researcher slowly walked the entire 500m transect and recorded all species of Passeriformes that he identified visually or by hearing. He also recorded the number of individuals of each species and the azimuth of the direction of detection. He also completed whether the individuals he observed were within 100 m of either side of the transect, or at more than 100 m. If species of Passeriformes were observed flying over the sampling area at the time of wetting, when they did not stop, they were recorded as an independent "fly over", and if they stopped within the habitat crossed by the transect, they were recorded as a dependent "fly over".

In all the above cases, except for the recording of nocturnal predators, some information on the behavior of the species observed in each case was recorded according to the following symbols and their interpretations: Flight - PT, Courtship - KN, Search - finding food and foraging - TR, Defining - defending territory - HP, Pair formation - ZE, Locating nesting sites - FL, Oviposition and incubation of eggs - AW and Transfer of food to offsprings - TRM. The above decoding of the behavior of the recorded species is an indication of the likelihood of breeding of these species in the area.

Regarding the other fauna (excluding avifauna) of the area, subsidiary surveys of reptiles, amphibians and mammals were carried out for a comprehensive assessment of the study area based on the following methodology.

Method of recording species of reptiles and amphibians

Linear Routes

When applying the method, paths were taken to and from specific points within the research area, and the species of amphibians and reptiles spotted by the researcher were recorded. Three linear transects (coinciding with the corresponding linear transects installed for avifauna) were installed in the surveyed field research area, which are shown in blue on the relevant maps.

In the field research area, the method of point-sounding surveys used to record anuran amphibians such as toads and frogs was used as a supplementary method. According to this method, breeding calls of mature males are used, in which mature males from breeding sites are present. In this way, the species composition and the relative population status of the species is recorded. At the same time, however, an attempt was also made to locate mature amphibian individuals around the perimeter of the water bodies of the wider area to record the species of the area with greater certainty, as the above method is particularly demanding and requires a high degree of expertise on the part of the researchers.

Random routes

The researcher moves around an area with as uniform a habitat as possible and records the species observed. The method is very efficient and allows more species to be recorded, while not giving an idea of relative density. The advantages of the method include the ability of the researcher to visit suitable microhabitats and to survey with a goal to identify specific species present in them, always in accordance with his experience. Recording on random routes was carried out throughout the study area during the researcher's movement to the recording points on the various visits that were made for bird observations (bird sampling sites).

In summary, the above paragraphs of this chapter describe the methodology applied in this study, the duration of the observations and the time required for each type of recording and finally the number of observers. The location of the recording points, which is depicted in Map 105 below, was chosen to ensure the most complete survey of the study area, as well as representativeness in relation to the wider area, in line with what is reported in the existing literature and the principles of science.

Finally, it is worth noting that although this was an A2 study, the study team chose to carry out annual counts rather than the four-monthly counts required by the current regulations. These additional counts were considered appropriate by the researchers because of their sensitivity to the wider protected area and the protected species living within it, covering not only the critical periods of spring migration and breeding, but also the other periods of the year, resulting in a more representative representation of the activity of all avifauna, not just those living in and passing through the wider area.

Mammalian recording method

Indirect observation using bioluminescent indications on linear routes.

During the hiking movements of the researchers between the sampling sites and during the movement on the linear transects installed for avifauna, during the return of the researcher and after the end of this measurement, biotic evidence of mammal presence (droppings, hair, tracks, etc.) was recorded. The trails are depicted in blue on the relevant maps in the relevant maps section. Recordings were made throughout the study area during access to the recording sites on the various visits that were made for bird observations.

List of the habitat types of Annexes I of the Government Ministerial Decision (G.M.D) Η.Π.14849/853/Ε103/4.4.2008 (Government Gazette Β' 645) (if it is an SAC, SCI).

The site of this project is not located within an SAC, SCI and therefore the habitat types of the wider area are not mapped, nor is there a requirement to do so.

According to the database and land cover mapping (Corine land cover 2018) reflected on the relevant maps, the area of the WWP PYRAMIS VRACHOU production license polygons is located within an area of natural grassland, hardwoods, and broadleaf forest (see relevant map section, Map 7). The above habitat types also cover most of the field research area of the project under study, with the habitat mosaic complemented by areas of land used for agriculture along with significant areas of natural vegetation, areas of coniferous forest, mixed forest and transitional woodland and scrub. In general, the above habitat types predominate in the area.

Inventory of the fauna species of Annexes I of the Government Ministerial Decision (G.M.D) Η.Π.14849/853/Ε103/4.4.2008 (Government Gazette Β' 645) (if it is an SAC, SCI).

The installation site of the project under study, as mentioned above, is located outside the Natura 2000 network areas of SAC, SCI. However, the other fauna (except for avifauna) of the wider area and the research area was recorded, which is presented in Table 17 below.

Table 17: *Fauna recorded in the research area.*

STATUS AND RANGE OF FAUNA SPECIES OBSERVED IN THE RESEARCH AREA			
Latin Denomination	**Common Denomination**	**Status**	
		IUCN EU	**ΕΛΛ(ΚΒ)**
MAMMALS			
Carnivora			
Canidae			
Vulpes vulpes	Fox	LC	NE
Mustelidae			
Martes foina	Beech marten	LC	NE
Felidae			
Felis silvestris	Wildcat	LC	NE
Lagomorpha			
Leporidae			
Lepus europaeus	Hare	LC	NE
Cetartiodactyla			
Suidae			
Sus scrofa	Wild Boar	LC	NE
Cervidae			
Capreolus capreolus	Roe Deer	LC	VU
Rodentia			
Sciuridae			
Sciurus vulgaris	Squirrel	LC	NE
REPTILES			
Squamata			
Sauria			
Lacertidae			
Lacerta viridis	European green lizard	LC	LC
Podarcis muralis	Common wall lizard	LC	LC
Anguidae			
Pseudopus apodus	Sheltopusik	LC	LC
Serpentes			
Psammophiidae			
Malpolon insignitus	Eastern Montpellier snake	LC	LC
Testudines			
Testudinidae			
Testudo graeca	Spur Thighed Tortoise	VU	LC
Testudo hermanni	Herman's Tortoise	NT	VU
AMPHIBIANS			

STATUS AND RANGE OF FAUNA SPECIES OBSERVED IN THE RESEARCH AREA			
Latin Denomination	**Common Denomination**	**Status**	
		IUCN EU	**ΕΛΛ(KB)**
Anura			
Bufonidae			
Bufotes viridis	Green Toad	LC	LC

Legend

Evaluation

EX : Extinct

EW : Extinct from their natural environment

CR : Critically endangered

EN : Endangered

VU : Vulnerable

NT : Near Threatened

Table 18 lists the fauna species (mammals, reptiles, amphibians) observed in the research area and their threatened status according to pan-European Directives and Conventions.

***Table 18**: Fauna species of the research area and threat status classifications*

THREATENED STATE OF FAUNA SPECIES OBSERVED IN THE RESEARCH AREA						
Species (Latin name)	**Species (English Name)**	**Threat regime**	**Directive 92/43/E**	**The Bern Conventi**	**Bonn Agreeme nt**	**CITES**
MAMMALS						
Carnivora						
Canidae						
Vulpes vulpes	Fox	LC				III
Mustelidae						
Martes foina	Beech Marten	LC		III		III
Felidae						
Felis silvestris	Wildcat	LC	IV	II		II
Lagomorpha						
Leporidae						
Lepus europaeus	Hare	LC		III		
Cetartiodactyla						

THREATENED STATE OF FAUNA SPECIES OBSERVED IN THE RESEARCH AREA						
Species (Latin name)	**Species (English Name)**	**Threat regime IUCN**	**Directive 92/43/EEK**	**The Bern Conventi**	**Bonn Agreeme nt**	**CITES**
Suidae						
Sus scrofa	Wild Boar	LC				
Cervidae						
Capreolus capreolus	Roe Deer	LC		III		
Rodentia						
Sciuridae						
Sciurus vulgaris	Squirrel	LC		III		
REPTILES						
Squamata						
Sauria						
Lacertidae						
Lacerta viridis	European green lizard	LC	IV	II		
Podarcis muralis	Common wall lizard	LC	IV	II		
Anguidae						
Pseudopus apodus	Sheltopusik	LC		II		
Serpentes						
Psammophiidae						
Malpolon insignitus	Eastern Montpellier snake	LC		III		
Testudines						
Testudinidae						
Testudo graeca	Spur Thighed Tortoise	VU	II, IV	II		II
Testudo hermanni	Herman's Tortoise	NT	II, IV	II		II
AMPHIBIANS						
Anura						
Bufonidae						
Bufotes viridis	Green Toad	LC	IV	II		

Legend

IUCN Threat Status

EX: Extinct, EW: Extinct from their natural habitat, CR: Critically Endangered, EN: Endangered, VU: Vulnerable, NT: Near Threatened, LC: Least Concern, DD: Not Well Known, NE: Not Assessed

Directive 92/43/EEK

I: belongs to Annex I of the Directive (types of natural habitats of Community interest whose conservation requires the designation of sites as Special Areas of Conservation)

II: included in Annex II to the Directive (animal and plant species of Community interest whose conservation requires the designation of Special Areas of Conservation)

III: included in Annex III to the Directive (criteria for the selection of sites that may be recognized as sites of Community interest and designated as Special Areas of Conservation)
IV: included in Annex IV to the Directive (animal and plant species of Community interest requiring strict protection)
V: included in Annex V to the Directive (animal and plant species of Community interest whose capture in the wild and exploitation may be subject to management measures)

Berne Convention

II: included in Annex II of the Treaty (fully protected species and their capture, possession and killing, damage or destruction of their breeding or resting places, disturbance during the breeding, dependence and hibernation period, destruction, collection or possession of their eggs and the possession or trade in these species, whether alive or dead, are prohibited)
III: belongs to Annex III of the Treaty (protected species and establishes periods of prohibition of hunting, temporarily or locally prohibits exploitation, and regulates the sale, possession, transport or offering for sale of these species, whether alive or dead)

Bonn Convention

I: included in Annex I to the Treaty (migratory species in danger of extinction)
II: included in Appendix II to the Treaty (migratory species benefiting from international cooperation on conservation and management measures)

International Convention CITES

I: included in Appendix I to the Convention (species threatened with extinction and affected or likely to be affected by trade)

II: included in Appendix II of the Convention (species which, although not currently threatened with extinction, may become threatened in the future if trade is not strictly regulated)

III: included in Appendix III to the Convention (species for which a Contracting State declares that they are subject, within the limits of its competence, to regulation aimed at preventing or restricting the exploitation of these species and requiring the cooperation of the other Contracting States)

As stated above, the site of the project and the field research area is not located within any of the 230 most important bat refuges in Greece according to the LIFE GRECABATS project. The closest one is located more than 25 km. More specifically, the closest corresponding site is located at an average distance (in a straight line) of 25.25 km south-southeast of the project site and is the site 'Dadia Mines' (Map 107).

Inventory of Annex I species of avifauna of the government ministerial decision (G.M.D) Η.Π. 37338/1807/Ε.103 (Β' 1495), as well as other migratory bird species with a significant presence in the Natura 2000 site, as to their conservation status and their isolation (if they are in a SPA).

As already mentioned, the site of the project under consideration is located within a Natura 2000 network area designated as a SPA. The avifauna in the study area recorded during the field research is presented in Table 19 below:

Table 19: *Birds recorded in the research area.*

STATUS AND RANGE OF BIRD SPECIES OBSERVED IN THE RESEARCH AREA				
Latin denomination	**Common denomination**	**Status**		**Presence in Greece**
		IUCN EU	**ΕΛΛ(ΚΒ)**	
Accipiteriformes				
Accipitridae				
Buteo buteo	Buzzard	LC	NE	R, WV
Circaetus gallicus	hort-toed (Snake) Eagle	LC	NT	sv, pm
Hieraaetus pennatus	Booted Eagle	LC	EN	sv, pm
Pernis apivorus	European Honey Buzzard	LC	LC	sv, PM
Gyps fulvus	Vulture	LC	VU/CR	R
Aegypius monachus	Cinereous Vulture	LC	EN	r
Falconiformes				
Falconidae				
Falco tinnunculus	Kestrel	LC	NE	R
Strigiformes				
Strigidae				
Strix aluco	Tawny owl	LC	NE	R
Coraciiformes				
Meropidae				
Merops apiaster	European Bee-eater	LC	NE	SV, PM
Caprimulgiformes				
Apodidae				
Tachymarptis melba	Alpine Swift	LC	NE	SV, PM
Charadriiformes				
Scolopacidae				
Scolopax rusticola	Woodcock	LC	NE	WV, r
Bucerotiformes				
Upopidae				
Upupa epops	Hoopoe	LC	NE	SV, PM
Columbiformes				
Columbidae				
Streptopelia turtur	Turtle dove	VU	NE	SV, PM
Columba palumbus	Wood pigeon	LC	NE	R
Cuculiformes				
Cuculidae				
Cuculus canorus	Cuckoo	LC	NE	sv, pm

STATUS AND RANGE OF BIRD SPECIES OBSERVED IN THE RESEARCH AREA				
Latin denomination	Common denomination	Status		Presence in Greece
		IUCN EU	ΕΛΛ(ΚΒ)	
Piciformes				
Picidae				
Dendrocopos major	Great Spotted Woodpecker	LC	NE	r
Picus viridis	Green woodpecker	LC	NE	r
Dryobates minor	Lesser Spotted Woodpecker	LC	NE	r
Dryocopus martius	Black woodpecker	LC	LC	r
Leiopicus medius	Middle Spotted Woodpecker	LC	LC	R
Passeriformes				
Hirundinidae				
Cecropis daurica	Red rumped Swallow	LC	NE	SV, pm
Hirundo rustica	barn swallow	LC	NE	SV, PM
Cerhiidae				
Certhia brachydactyla	*Short toed Treecreeper*	LC	NE	R
Phylloscopidae				
Phylloscopus collybita	Common Chiffchaff	LC	NE	WV, sv?
Phylloscopus trochilus	Willow Warbler	LC	NE	PM, R
Regulidae				
Regulus regulus	Goldcrest	LC	NE	WV
Alaudidae				
Lullula arborea	Woodlark	LC	LC	R
Aegithalidae				
Aegithalos caudatus	Long tailed Tit	LC	NE	R
Sittidae				
Sitta europaea	Eurasian Nuthatch	LC	NE	R
Muscicapidae				
Erithacus rubecula	European Robin	LC	NE	WV, r
Muscicapa striata	Spotted Flycatcher	LC	NE	PM, sv
Laniidae				
Lanius collurio	Red backed Shrike	LC	NE	SV, PM
Turdidae				
Turdus merula	Common Blackbird	LC	NE	R, WV
Turdus pilaris	Fieldfare	LC	NE	WV, r?
Turdus viscivorus	Mistle Thrush	LC	NE	R, wv
Turdus philomelos	Song Thrush	LC	NE	WV, r

STATUS AND RANGE OF BIRD SPECIES OBSERVED IN THE RESEARCH AREA				
Latin denomination	**Common denomination**	**Status**		**Presence in Greece**
		IUCN EU	**ΕΛΛ(ΚΒ)**	
Paridae				
Parus major	Great Tit	LC	NE	R
Cyanistes caeruleus	Blue Tit	LC	NE	R
Poecile lugubris	Sombre Tit	LC	NE	r
Poecile palustris	Marsh Tit	LC	NE	R
Periparus ater	Coal Tit	LC	NE	R
Corvidae				
Corvus corax	Common Raven	LC	NE	R
Corvus cornix	Crow	LC	NE	R
Garrulus glandarius	Eurasian Jay	LC	NE	R
Sturnidae				
Sturnus vulgaris	Common Starling	LC	NE	WV, R
Troglodytidae				
Troglodytes troglodytes	Eurasian Wren	LC	NE	R
Sylviiidae				
Curruca melanocephala	Sardinian Warbler	LC	NE	R
Curruca curruca	Lesser Whitethroat	LC	NE	SV, PM
Fringillidae				
Carduelis carduelis	European Goldfinch	LC	NE	R, wv
Fringilla coelebs	Common Chaffinch	LC	NE	R, WV
Linnaria cannabina	Common Linnet	LC	NE	R, wv
Chloris chloris	European Greenfinch	LC	NE	R, wv
Coccothraustes coccothraustes	Hawfinch	LC	NE	WV, r
Spinus spinus	Eurasian Siskin	LC	NE	WV, r
Serinus Serinus	European Serin	LC	NE	R, wv
Emberizidae				
Emberiza cirlus	Cirl Bunting	LC	NE	R
Emberiza cia	Rock Bunting	LC	NE	r

LEGEND

Evaluation

EX : Deceased

EW : Extinct from their natural environment

CR : Critically endangered

EN : Endangered

VU : Vulnerable

NT : Near Threatened

LC : Of limited concern

DD : Not sufficiently known

NE : Not assessed

Status of presence

R : Non-migratory - Resident

PM : Passage Migrant

SV : Summer visitor (breeding)

PLM: Partial migrant (breeding)

NBV: Nonbreeding visitor

WV :Winter visitor

Capital letters indicate that the species is common in this category and lower case indicates that it is rare.

Acc : Accidental visitor - Accidental

Ext : Extinct

Int : Introduced

FBr : Formerly breeding.

Table 20 lists the species of avifauna observed in the research area and their threat status according to European Directives and Conventions, while Table 21 lists the species of avifauna observed and the months in which they were observed.

Table 20: *Species of avifauna in the research area and threat status classifications*

THREATENED STATUS OF BIRD SPECIES OBSERVED IN THE RESEARCH AREA							
Species (Latin name)	**Species (English Name)**	**Category SPEC**	**Threat Regime IUCN (EU)**	**Directive on Birds**	**Bern Convention**	**Bonn Convention**	**CITES**
Accipiteriformes							
Accipitridae							
Circaetus gallicus	Short toed Snake Eagle	n	LC	I	II	II	II
Buteo buteo	Common Buzzard	n	LC		II	II	II
Hieraaetus pennatus	Booted Eagle	n	LC	I	II	II	II
Pernis apivorus	European Honey Buzzard	n	LC	I	II	II	II
Gyps fulvus	Vulture	n	LC	I	II	II	II
Aegypius monachus	Cinereous Vulture	1	LC	I	II	II	II

THREATENED STATUS OF BIRD SPECIES OBSERVED IN THE RESEARCH AREA							
Species (Latin name)	**Species (English Name)**	**Category SPEC**	**Threat Regime IUCN (EU)**	**Directive on Birds**	**Bern Convention**	**Bonn Convention**	**CITES**
Falconiformes							
Falconidae							
Falco tinnunculus	Kestrel	3	LC		II	II	II
Strigiformes							
Strigidae							
Strix aluco	Tawny owl	n	LC		II		II
Coraciiformes							
Meropidae							
Merops apiaster	European Bee-eater	n	LC		II	II	
Caprimulgiformes							
Apodidae							
Tachymarptis melba	*Alpine Swift*	n	LC		II		
Charadriiformes							
Scolopacidae							
Scolopax rusticola	Eurasian Woodcock	n	LC	II, III	III	II	
Bucerotiformes							
Upopidae							
Upupa epops	Hoopoe	n	LC		II		
Columbiformes							
Columbidae							
Streptopelia turtur	Turtle dove	1	VU	II	III	II	
Columba palumbus	Wood pigeon	n	LC	II/III			
Cuculiformes							
Cuculidae							
Cuculus canorus	Cuckoo	n	LC		III		
Piciformes							
Picidae							
Dendrocopos major	Great Spotted Woodpecker	n	LC		II		
Picus viridis	Green woodpecker	n	LC		II		
Dryobates minor	Lesser Spotted Woodpecker	n	LC		II		
Dryocopus martius	Black woodpecker	n	LC	I	II		
Leiopicus medius	Middle Spotted Woodpecker	n	LC	I	II		
Passeriformes							
Hirundinidae							
Cecropis daurica	Red rumped Swallow	n	LC		II		
Hirundo rustica	barn swallow	3	LC		II		

THREATENED STATUS OF BIRD SPECIES OBSERVED IN THE RESEARCH AREA							
Species (Latin name)	**Species (English Name)**	**Category SPEC**	**Threat Regime IUCN (EU)**	**Directive on Birds**	**Bern Convention**	**Bonn Convention**	**CITES**
Cerhiidae							
Certhia brachydactyla	Short toed Treecreeper	n	LC		II		
Phylloscopidae							
Phylloscopus collybita	Common Chiffchaff	n	LC		II	II	
Phylloscopus trochilus	Goldcrest	3	LC		II	II	
Alaudidae							
Lullula arborea	Woodlark	2	LC	I	III		
Aegithalidae							
Aegithalos caudatus	Long tailed Tit	n	LC		III	II	
Sittidae							
Sitta europaea	Eurasian Nuthatch	n	LC		II		
Muscicapidae							
Erithacus rubecula	European Robin	n	LC		II	II	
Muscicapa striata	Spotted Flycatcher	2	LC		II	II	
Laniidae							
Lanius collurio	Red backed Shrike	2	LC	I	II		
Turdidae							
Turdus merula	Common Blackbird	n	LC	II	III	II	
Turdus pilaris	Fieldfare	n	LC	II	III	II	
Turdus viscivorus	Mistle Thrush	n	LC	II	III	II	
Turdus philomelos	Song Thrush	n	LC	II	III	II	
Paridae							
Parus major	Great Tit	n	LC		II		
Cyanistes caeruleus	Blue Tit	n	LC		II		
Poecile lugubris	Sombre Tit	n	LC		II		
Poecile palustris	Marsh Tit	n	LC		II		
Periparus ater	Coal tit	n	LC		II		
Corvidae							
Corvus corax	Common Raven	n	LC		III		
Corvus cornix	Crow	n	LC	II			
Garrulus glandarius	Eurasian Jay	n	LC	II			
Sturnidae							
Sturnus vulgaris	Common Starling	3	LC	II			
Troglodytidae							
Troglodytes troglodytes	Eurasian Wren	n	LC		II		
Sylviidae							

THREATENED STATUS OF BIRD SPECIES OBSERVED IN THE RESEARCH AREA							
Species (Latin name)	**Species (English Name)**	**Category SPEC**	**Threat Regime IUCN (EU)**	**Directive on Birds**	**Bern Convention**	**Bonn Convention**	**CITES**
Curruca melanocephala	Sardinian Warbler	n	LC		II	II	
Curruca curruca	Lesser Whitethroat	n	LC		II	II	
Fringillidae							
Carduelis carduelis	European Goldfinch	n	LC		II		
Fringilla coelebs	Common Chaffinch	n	LC		III		
Linnaria cannabina	Common Linnet	2	LC		II		
Chloris chloris	European Greenfinch	n	LC		II		
Coccothraustes coccothraustes	Hawfinch	n	LC		II		
Spinus spinus	Eurasian Siskin	n	LC		II		
Serinus serinus	European Serin	2	LC		II		
Emberizidae							
Emberiza cirlus	Cirl Bunting	n	LC		II		

Legend
IUCN Threat Status
EX: Extinct, EW: Extinct from their natural habitat, CR: Critically Endangered, EN: Endangered, VU: Vulnerable, NT: Near Threatened, LC: Least Concern, DD: Not Well Known, NE: Not Assessed.

1: SPEC category
1. European species of global conservation concern, e.g., species classified as Critically Endangered, Endangered, Vulnerable, Vulnerable, or Near Threatened at global level.
2: SPEC 2 category. Species whose global populations are concentrated in Europe are classified as locally extinct, critically endangered, endangered, vulnerable, vulnerable, near threatened, depleted or rare at European level.
3: SPEC 3 category. Species whose global population is not concentrated in Europe, but which are classified as locally extinct, critically endangered, endangered, vulnerable, near threatened, depleted or rare at European level.
n: Non-SPECE or Non- SPEC category: Species whose global population is concentrated in Europe but whose European population level is currently considered safe, or species whose global population is not concentrated in Europe and whose European population level is currently considered safe.
Directive 2009/147/EK
I: included in Appendix I of the Directive (species classified as vulnerable, rare, or endangered and subject to special conservation measures)
II: belongs to Appendix II of the Directive (II/1 species that may be hunted in all States, and II/2 species that may be hunted in some States)
III: included in Appendix III to the Directive (species which may be traded under certain conditions)
Berne Convention
II: belongs to Annex II of the Treaty (fully protected species and their capture, possession and killing, damage or destruction of their breeding or resting places, disturbance during the breeding, dependence and hibernation period, destruction, collection or possession of their eggs and possession or trade in these species, whether alive or dead, are prohibited)
III: belongs to Annex III of the Treaty (protected species and establishes periods of prohibition of hunting, temporarily or locally prohibits exploitation, and regulates the sale, possession, transport or offering for sale of these species, whether alive or dead)
Bonn Convention
I: included in Annex I to the Treaty (migratory species in danger of extinction)

II: included in Appendix II to the Treaty (migratory species benefiting from international cooperation on conservation and management measures)
International Convention CITES
I: included in Appendix I to the Convention (species threatened with extinction and affected or likely to be affected by trade)
II: included in Appendix II of the Convention (species which, although not currently threatened with extinction, may become threatened in the future if trade is not strictly regulated)
III: included in Appendix III to the Convention (species for which a Contracting State declares that they are subject, within the limits of its competence, to regulation aimed at preventing or restricting the exploitation of these species and requiring the cooperation of the other Contracting States)

Table 21: *Species of avifauna in the research area by month of observations*

Scientific Name	English Name	July 2020	August 2020	September 2020	October 2020	November 2020	December 2020	January 2021	February 2021	March 2021	April 2021	May 2021	June 2021
Aegithalos caudatus	Long tailed Tit				*				*				
Aegypius monachus	Cinereous Vulture	*	*	*	*						*		*
Buteo buteo	Common Buzzard			*	*	*	*		*	*	*	*	*
Carduelis carduelis	European Goldfinch				*	*	*	*	*	*			
Cercopis daurica	Red rumped Swallow		*										
Chloris chloris	European Greenfinch				*	*	*	*	*	*	*	*	
Certhia brachydactyla	Short toed Treecreeper			*									
Circaetus gallicus	Short toed Snake Eagle	*	*	*							*	*	
Coccothraustes coccothraustes	Hawfinch					*	*		*	*			
Columba palumbus	Common Wood Pigeon	*	*		*	*	*	*	*	*	*		
Corvus corax	Common Raven	*	*		*		*	*	*		*		
Corvus cornix	Hooded crow		*				*	*	*	*			
Cuculus canorus	Common Cuckoo										*	*	
Curruca curruca	Lesser Whitethroat	*										*	

Scientific Name	English Name	July 2020	August 2020	September 2020	October 2020	November 2020	December 2020	January 2021	February 2021	March 2021	April 2021	May 2021	June 2021
Curruca melanocephala	Sardinian Warbler											*	
Cyanistes caeruleus	Blue Tit	*	*	*	*	*	*	*	*	*	*	*	*
Dendrocopos major	Great Spotted Woodpecker	*	*			*					*		
Dryobates minor	Lesser Spotted Woodpecker						*						
Dryocopus martius	Black Woodpecker												*
Emberiza cia	Rock Bunting			*									
Emberiza cirlus	Cirl Bunting		*				*			*			
Erithacus rubecula	European Robin	*	*	*	*	*	*	*	*	*	*	*	*
Falco tinnunculus	Common Kestrel				*								
Fringilla coelebs	Common Chaffinch	*	*	*	*	*	*	*	*	*	*	*	*
Garrulus glandarius	Eurasian Jay	*	*	*	*	*	*	*	*	*	*	*	*
Gyps fulvus	Griffon Vulture		*	*	*					*			
Hieraaetus pennatus	Booted Eagle												*
Hirundo rustica	Barn Swallow		*										*
Lanius collurio	Red backed Shrike		*	*									*
Leiopicus medius	Middle Spotted Woodpecker		*										
Linaria cannabina	Common Linnet			*	*	*	*	*		*	*		
Lullula arborea	Woodlark				*		*					*	*
Merops apiaster	European Bee eater	*	*									*	*
Muscicapa striata	Spotted Flycatcher			*									
Parus major	Great Tit	*	*	*	*	*	*	*	*	*	*	*	*
Periparus ater	Coal Tit				*								

Scientific Name	English Name	July 2020	August 2020	September 2020	October 2020	November 2020	December 2020	January 2021	February 2021	March 2021	April 2021	May 2021	June 2021
Pernis apivorus	European Honey Buzzard		*										
Phylloscopus collybita	Common Chiffchaff	*	*								*		
Phylloscopus trochilus	Willow Warbler		*										
Picus viridis	European Green Woodpecker										*		
Poecile lugubris	Parus lugubris								*		*		
Poecile palustris	Marsh Tit					*	*	*	*	*			
Regulus regulus	Goldcrest				*				*				
Scolopax rusticola	Eurasian Woodcock				*								
Serinus serinus	European Serin											*	
Sitta europaea	Eurasian Nuthatch	*	*	*	*	*	*	*	*	*	*	*	*
Spinus spinus	Eurasian Siskin				*	*	*		*	*			
Streptopelia turtur	European Turtle Dove											*	*
Strix aluco	Tawny Owl				*		*						
Sturnus vulgaris	Common Starling							*	*	*			
Tachymarptis melba	Alpine Swift		*										*
Troglodytes troglodytes	Wren					*	*		*				
Turdus merula	Common Blackbird	*	*	*	*	*	*	*	*	*	*	*	*
Turdus philomelos	Song Thrush					*	*			*			
Turdus pilaris	Fieldfare							*	*				
Turdus viscivorus	Mistle Thrush	*	*	*	*	*	*	*	*	*	*	*	*
Upupa epops	Hoopoe	*										*	

The population data of the avifauna of the study area, which is located both within the statutory area as a Natura 2000 network SPA with the code GR1110010 and within the non-statutory area GR003 with the designation IBA, were based on the population estimates of the non-governmental organisation Hellenic Ornithological Society, as well as on the population estimates of the main study area SPA GR1110010 and the neighbouring study areas (GR1130011, GR1110002 and BG0002019). In addition, population estimates have been provided for the nearest SPA GR008. This data has been presented in Tables 9, 10, 11, 12, 13 and 14 herein.

A table (Table 22) is presented below showing the records of raptor species and species considered 'important' for the field study area, the frequency with which these species were observed in the survey and study area, and the months in which they were recorded. The table is derived from the daily and monthly field research logs. Species of importance for the area are recorded in the table below as those species observed in the field research area that are either qualifying or delimiting species of the main study SPA GR1110010, either they are designation species of the nearest Greek IBA GR003 (where the project under study is located), or they are designation species of the nearest Greek IBA GR003 (where the project under study is located), either they are designation species of the nearest SPA GR1130011 and the nearest IBA GR008, either they are species of interest (as selected in a previous section from the total number of protected areas under study) or they are included in Annex I of Directive 79/409/EEC, as codified by Directive 2009/147/EC.

The field measurements show that 9 species included in Annex I of Directive 2009/147/EC were identified in the area. Of these species, 7 are species of interest, as selected in a previous section of this report. Also observed were the species Curruca melanocephala, Picus viridis and Strix aluco which, although not Annex I species of the above Directive, are included in the table below as they are species of interest in this SEA (species of interest for the classification of the IBA under study).

Table 22. *Important species of avifauna that meet the criteria for further analysis.*

Species	Total species recordings	Months (numeric: e.g., 1=January)
Aegypius monachus	13	7/2020, 8/2020, 9/2020, 10/2020, 4/2021, 6/2021
Circaetus gallicus	7	7/2020, 8/2020, 9/2020, 4/2021, 5/2021
Dryocopus martius	2	11/2020, 6/2021
Gyps fulvus	6	8/2020, 9/2020, 10/2020, 3/2021
Hieraaetus pennatus	2	6/2021
Lanius collurio	4	8/2020, 9/2020, 6/2021
Lullula arborea	4	10/2020, 12/2020, 5/2021, 6/2021
Leiopicus medius	1	8/2020
Pernis apivorus	2	8/2020
Curruca melanocephala	1	5/2021
Picus viridis	1	4/2021
Strix aluco	2	10/2020, 12/2020

Description of recorded flights

In the next section, a commentary is provided on the recorded flights and sightings of the raptor species presented in the above table, as well as of the other important species listed in Annex I of Directive 2009/147/EC.

The Cinereous Vulture (Aeygypius monachus) was recorded 13 times (19 individuals in total) in the study area during the observations in July 2020, August 2020, September 2020, October 2020, April 2021 and June 2021, with six of the total records being the crossing of two individuals per flight/record. Of these six records with two individuals per flight, one took place within the Direct Effect Zone (distance of less than 100 m from the location of the nearest wind turbine of the WPP studied, but at an altitude of more than 30 m and less than 150 m), one recording took place within zone A (distance of less than 250 metres from the location of the nearest wind turbine of the WPP studied) and even at a distance of less than 100 metres from the location of the nearest wind turbine of the project, but with a very high flight altitude (more than 300 metres) and for this reason this flight was not considered to be in the direct impact zone, one flight took place within zone B (distance between 250 and 1.000 metres from the location of the nearest wind turbine of the WPP studied). One recording took place within Zone C (distance between 1.000 and 2.000 metres from the location of the nearest wind turbine of the project), while the remaining two recordings were made outside the zones of impact with the wind turbines of the project (distance more than 2 km from the location of the nearest wind turbine of the project) and one within Zone C (distance more than 2 km from the location of the nearest wind turbine of the project). Finally, of the remaining seven single recordings (crossing of one individual per flight/recording), one took place within Zone A, two of them two were carried out within Zone C and four were carried out outside of the impact zones with the project wind turbines (distance greater than 2 km).

The vulture (Gyps fulvus) was recorded six times (13 individuals in total) in the study area during the observations in the months of August 2020, September 2020, October 2020 and March 2021, of which one record was a crossing of seven individuals and took place within Zone A, at a distance of less than 100 m from the location of the nearest wind turbine of the Project, but with a high flight altitude (greater than 250 m) and for this reason this flight was not classified as a Direct Impact Zone. Also, of the total number of records, one was a crossing of two individuals and took place within Zone A, less than 100 m from the location of the nearest wind turbine of the Project, but at a very high altitude (approximately 500 m). Finally, of the remaining four single records ("single individual crossing/record"), two were within Zone B and two were in Zone B. Both were outside the impact zones of the project's wind turbines (more than 2 km from the location of the nearest wind turbine).

The Short-toed Eagle (Circaetus gallicus) was recorded seven times (ten individuals in total) in the study area during the observations in the months of July 2020, August 2020, September 2020, April 2021 and May 2021, with three of these recordings involving the passage of two individuals per flight/recording and one within Zone B, while the other two were made outside the zones of influence of the project turbines (distance greater than 2 km from the installation site of the nearest turbine). Of the remaining four individual recordings (one individual passage per flight/recording), one was made within Zone B and the remaining three were made outside the WPP impact zones (distance greater than 2 km).

The Booted Eagle (Hieraaetus pennatus) was recorded twice (two individuals) in the study area during the observations in June 2021. One of the individuals passed through Zone C, while the second occurred outside the WPP impact zones (at a distance of more than 2 km from the site of the nearest wind turbine of the project under study).

The European Honey Buzzard *(Pernis apivrous*) was recorded twice (six individuals in total) in the study area during the August 2020 observations, with one recording involving the crossing of four individuals and occurred in zone B and the second recording, involving the passage of two individuals, occurred in zone C.

In summary, no active nest of any of the above species was detected in the vicinity of the project area, nor did their movements indicate the presence of a nest in the field survey area, therefore there is no need to designate nesting and feeding zones as required by No. 2 of Ministerial Decision 8353/276/E106.

Apart from the above species, which, based on their protection status and other criteria that they meet and were analyzed in the previous sections, deserve further analysis, two of the most common raptor species in Greece (although they are not species of Annex I of Directive 2009/147/EC), the **Buzzard (Buteo Buteo)** and the **Common Kestrel (Falco tinnunculus)** were observed in the area. The two common species mentioned above were recorded several times in the study area (buzzard: eleven times with eleven individuals passing) (Common Kestrel two times with two individuals passing).

Apart from the raptor species, whose flights were described above, a description of the other species of interest found in the area is given below.

The **Red backed Shrike (Lanius collurio)** was recorded four times (5 individuals in total) in the study area during observations in August 2020, September 2020, and June 2021.

The **Woodlark (Lullula arborea)** was recorded four times (5 individuals in total) in the study area during observations in October 2020, December 2020, May 2021, and June 2021.

The **Middle-Spotted Woodpecker (Leiopicus medius)** was recorded once (one individual) in the study area during observations in August 2020.

The **Black woodpecker (Dryocopus martius)** was recorded twice (two individuals) in the study area during observations in November 2020 and June 2021.

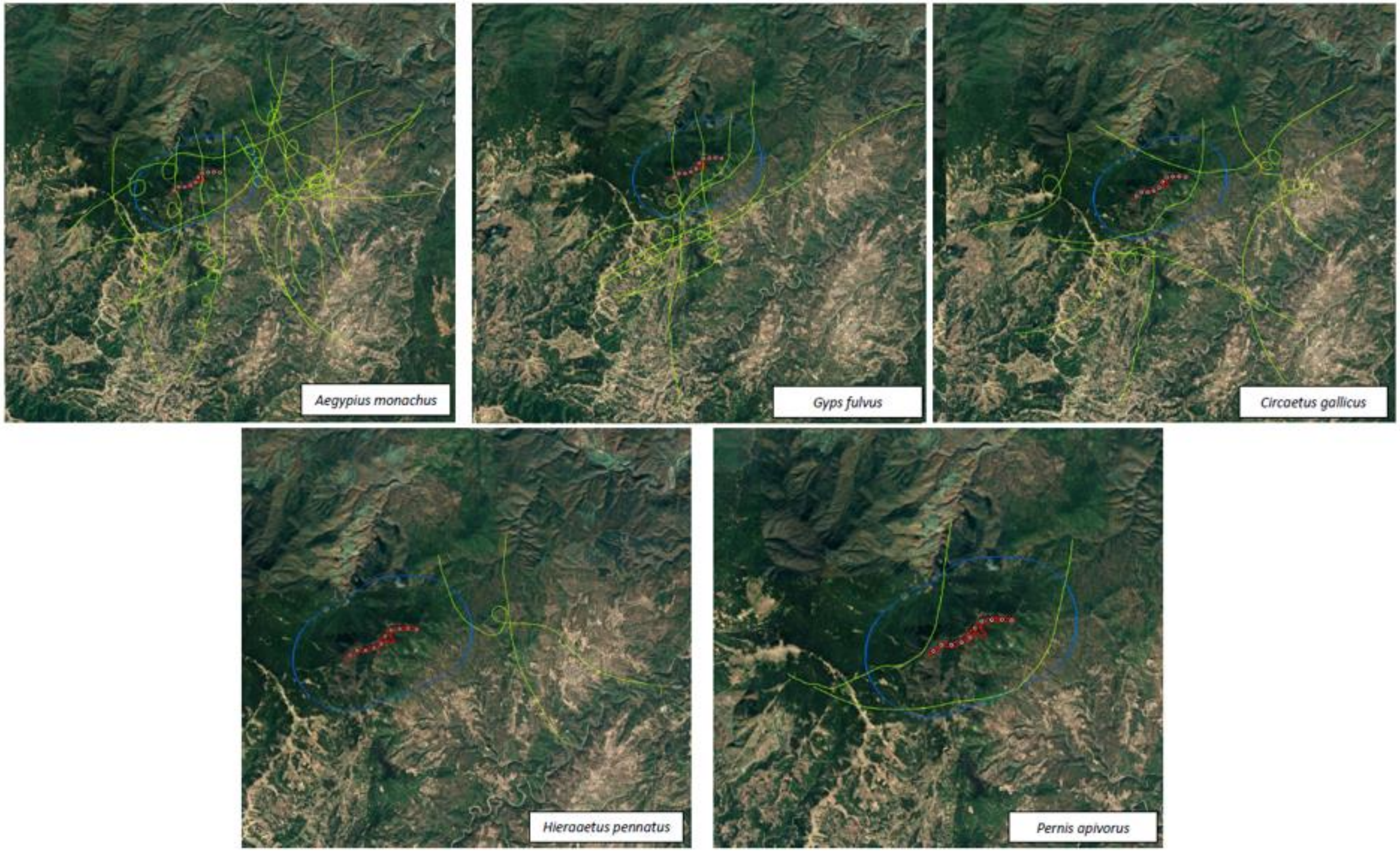
The **Sardinian Warbler (Curruca melanocephala)** was recorded once (one individual) in the study area during observations in May 2021.

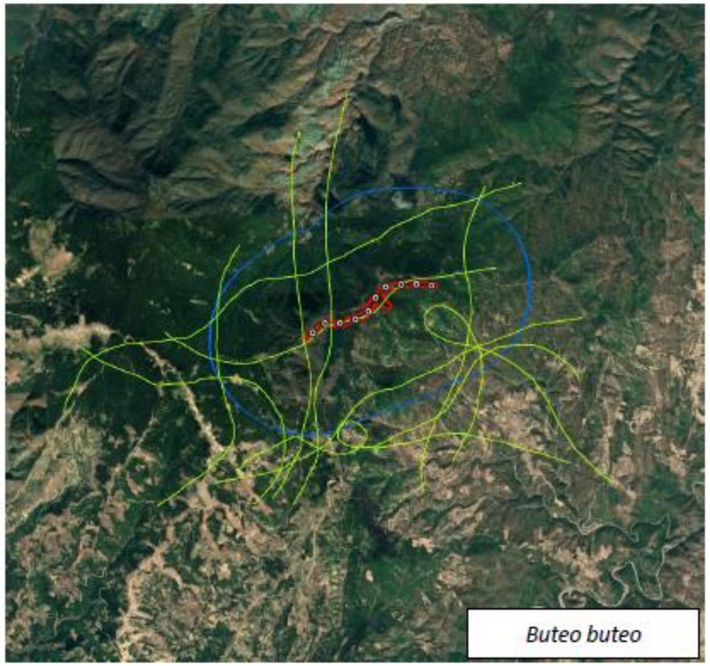
The **Tawny Owl (Strix aluco)** was recorded twice (two individuals) in the study area during observations, in October 2020 and December 2020.

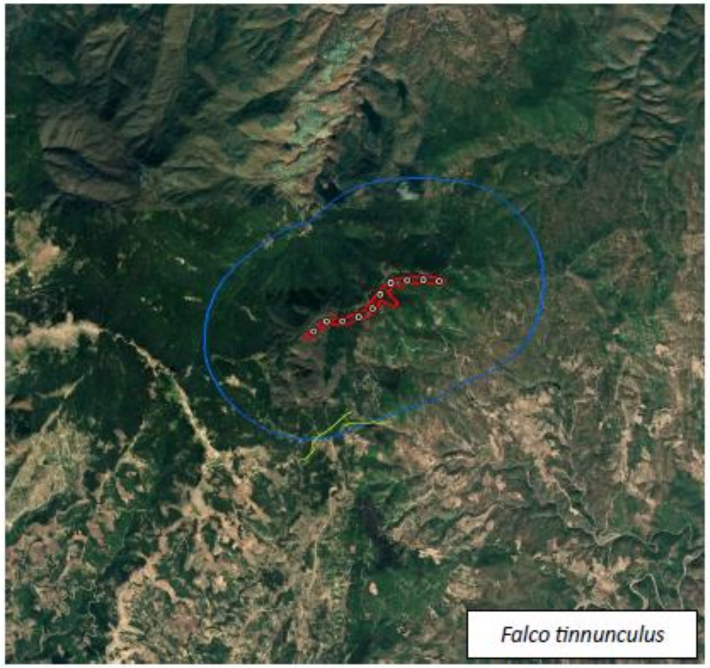
Capturing the above information on Maps with bird recording points

The field research area and the field sampling locations of the avifauna within it (and with satellite image background) are then depicted on Maps with bird recording points, as analyzed in the previous section. In addition, maps for land use and habitat types within the field research area according to the 2018 Corine land cover base, and maps with satellite image backgrounds depict all flights of raptors and other important species recorded during the field research along with the locations of the wind turbine installations for the project under study. Finally, a Map with bird recording points also illustrates the locations of the nearest significant bat caves in the study area and their locations relative to the location of the field research area.

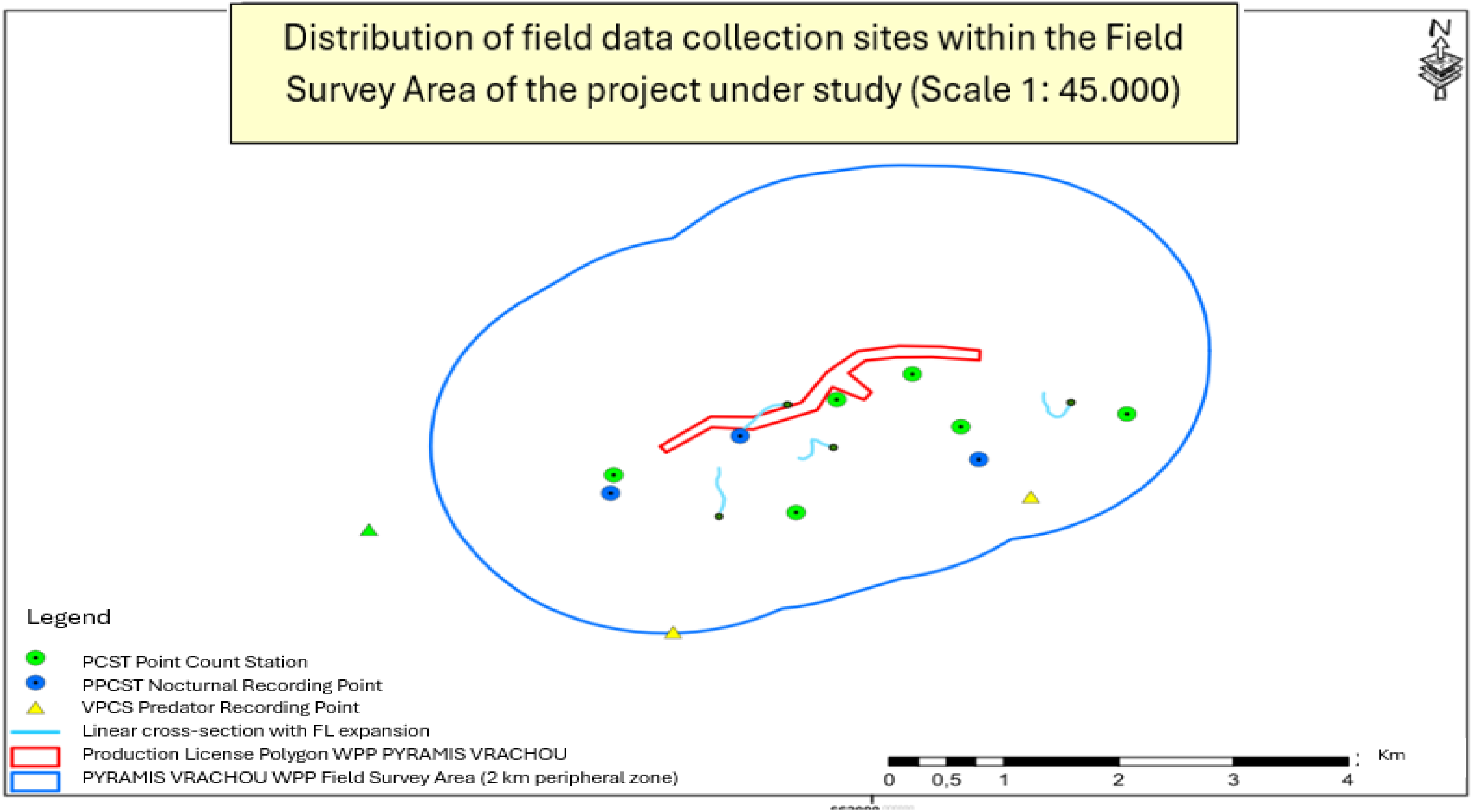
Mapping of the flights of important species (and other predators) **recorded during the survey**



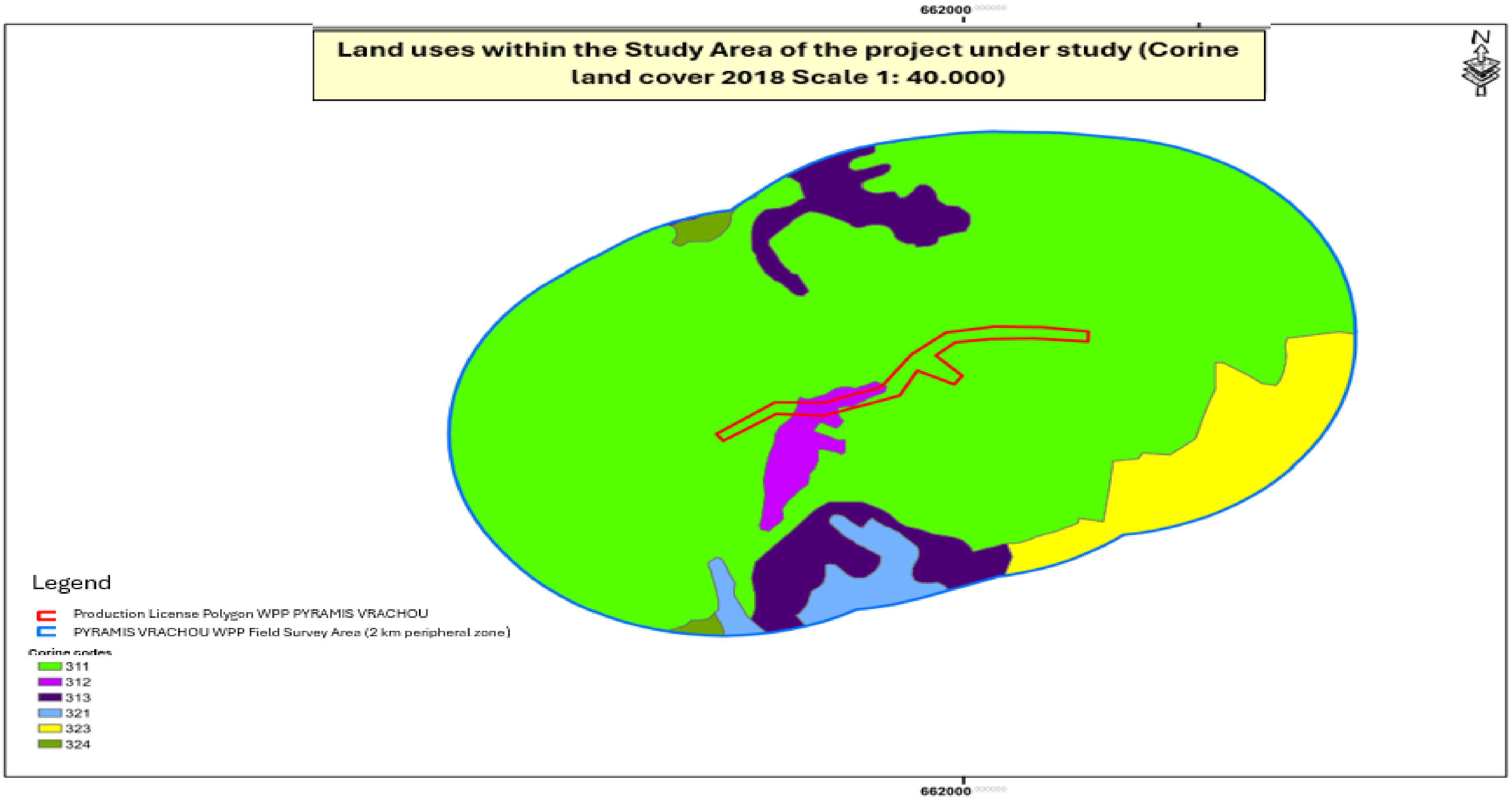

Buteo buteo


Falco tinnunculus

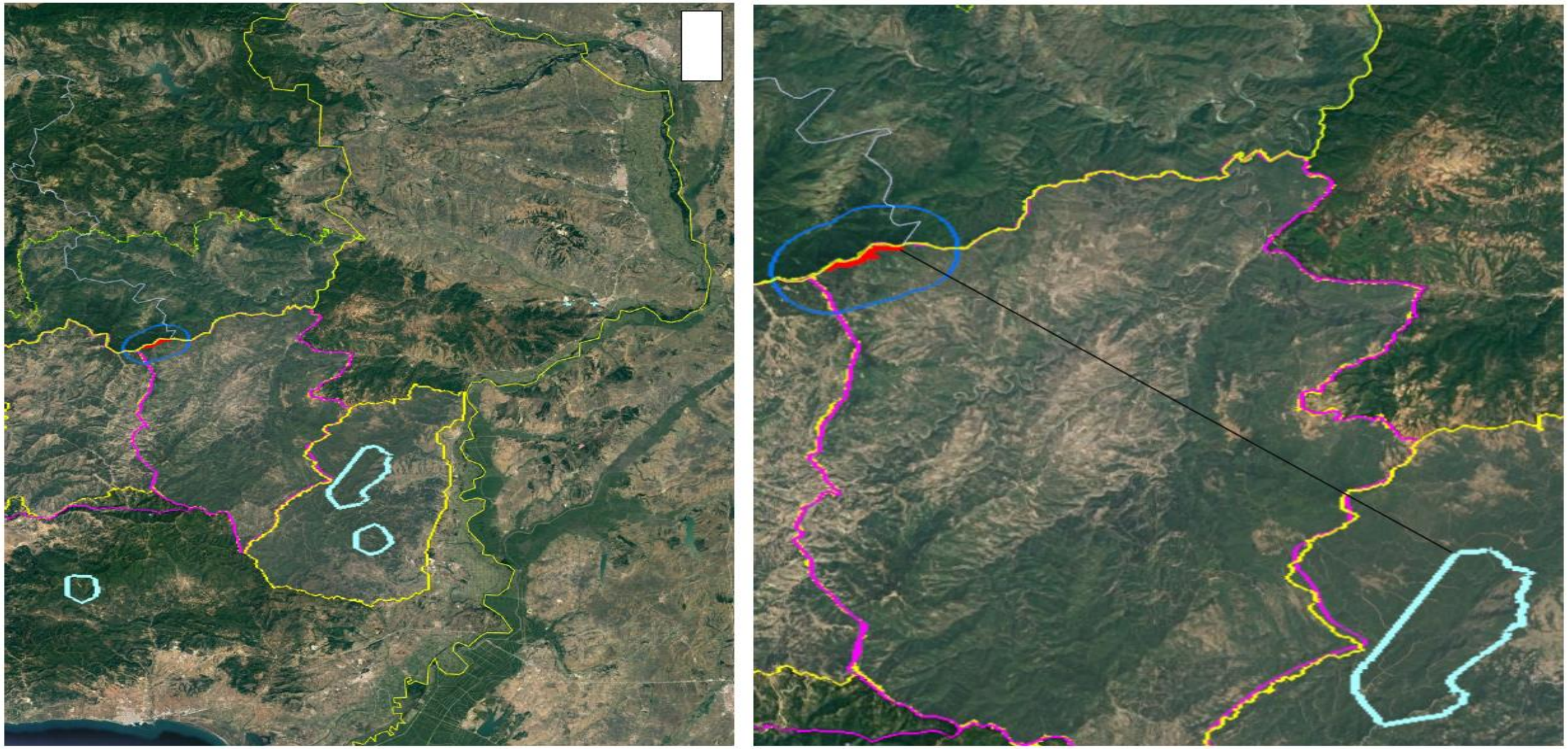
Map 104: Satellite image of distribution of field data collection sites for avifauna (red outline shows the production permit polygons of the project under study and blue outline shows the field research area).



Map 105: Distribution map of field data collection locations within the Field research Area of the project under study.



Map 106: Land use within the Field research Area of the project under study, according to the land cover database and mapping (Corine land cover 2018)



Map 107: Location of the most important caves and their proposed protection areas (outlined in blue) near the study areas, GR1110010, GR1130011, GR1110002, BG0002019 (outlined in pink) and GR003 and GR008 (outlined in green), and in relation to the location of the field research area (outlined in blue) and the project's production license polygons (outlined in red). The nearest corresponding location is more than 25 km away (26,54 km) and is the 'Dadia Mines' location (map on the right - the distance from this location is indicated by a black straight line.

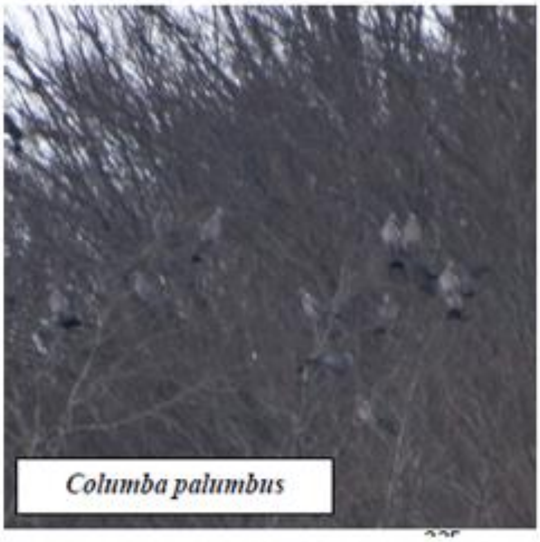
Photographic documentation of the study area: Indicative photographs of wildlife species from the field research

Aegypius monachus

Gyps fulvus

Parus major

Buteo buteo



Columba palumbus

Pernis apivorus

Lanius collurio

Garrulus glandarius

Dendrocopos major

Circaetus gallicus

Coccothraustes coccothraustes

INVENTORY OF THE STATE OF THE NATURAL ENVIRONMENT IN THE NATURA 2000 NETWORK AREA

The Production Licence Polygon of the Project under consideration, as mentioned in previous sections of this SEA, is located within the protected area of the Natura 2000 SPA GR1110010, as well as within the BIA GR003, taking into account the neighbouring protected areas of the SPAs GR1130011, GR1110002 and BG0002019, as well as the nearest BIA GR008.

Conservation objectives of the Natura 2000 site concerned parameters contributing to the conservation value of the site.

The establishment of conservation objectives for the avifauna species included in the Special Protection Areas (SPAs) of the National Ecological Network NATURA 2000, as provided for by the Decree of the Ministers of Finance, Economy, Competitiveness and Shipping, and of Environment, Energy and Climate Change (Β' 1495), in accordance with subparagraph b' of para. 3 of Article 21 of Law No. 1650/1986 (A' 160), a better assessment of the monitoring of the evolution of the protected object of the Natura site in question can be made.

The conservation objectives for the bird species listed in par. 1 and 2 of Article 4 of Directive 2009/147/EC for all the Special Protection Areas (SPAs) of the national ecological network NATURA 2000 of Greece were established by the decision of the Deputy Minister of Environment and Energy ΥΠΕΝ/ΔΔΦΠΒ/50146/1786 (ΦΕΚ 3118/Β'/10-05-2023).

The aforementioned decision includes the annex concerning the SPAs GR1110010, GR1130011 and GR1110002 (for the SPA BG0002019 no Management Plan has been prepared), within or close to which the study area is located, setting out the conservation objectives depicted in the tables below:

Conservation Objectives for the OREINOS EVROS - KOILADA DEREIOU SPA (GR1110010)							
Species referred to in par. 1 and 4 of Article 4 of Joint Ministerial Decision 2 under No 37338/1807/E.103/01.09.2010							
Code	**Name**	**Type**	**Parameter**	**Unit of measurement of parameter**	**Target value**	**Specific target**	**Observations**
A402	Accipiter brevipes	r	Population	pairs	Insufficient data	Insufficient data	
A223	Aegolius funereus	p	Population	pairs	Insufficient data	Insufficient data	
A079	Aegypius monachus	p	Population	pairs	Insufficient data	Insufficient data	
A229	Alcedo atthis	p	Population	pairs	Insufficient data	Insufficient data	
A255	Anthus campestris	r	Population	pairs	Insufficient data	Insufficient data	

A226	Apus apus	r	Population	pairs	Insufficient data	Insufficient data	
A091	**Aquila crhysaetos**	**p**	**Population**	pairs	**7**	**Reach**	
A404	Aquila heliaca	c	Population	individuals	Insufficient data	Insufficient data	
A028	Adrea cinarea	c	Population	individuals	Insufficient data	Insufficient data	
A215	Bubo bubo	p	Population	pairs	Insufficient data	Insufficient data	
A087	Buteo buteo	r	Population	pairs	Insufficient data	Insufficient data	
A403	Buteo rufinus	c	Population	individuals	Insufficient data	Insufficient data	
A243	Calandrella brachydactylla	r	Population	pairs	Insufficient data	Insufficient data	
A224	Caprimulgus europaeus	r	Population	pairs	Insufficient data	Insufficient data	
A031	Ciconia ciconia	c	Population	individuals	Insufficient data	Insufficient data	
A030	**Ciconia nigra**	**r**	**Population**	pairs	**6**	**Conservation**	**Given the general picture of the species in the Evros region and the existence of interests (forests and the permanent flow of rivers for feeding), the population is estimated to be larger than the recorded one. The ETA is defined as the number of 6 pairs which is the maximum historical estimate.**
A080	**Circaetus gallicus**	**r**	**Population**	pairs	Insufficient data	**Conservation**	
A081	Circus aeruginosus	c	Population	individuals	Insufficient data	Insufficient data	
A082	Circus cyaneus	c	Population	individuals	Insufficient data	Insufficient data	
A083	Circus macrourus	c	Population	individuals	Insufficient data	Insufficient data	
A084	Circus pygargus	c	Population	individuals	Insufficient data	Insufficient data	
A859	Clanga clanga	c	Population	individuals	Insufficient data	Insufficient data	
A858	**Clanga Pomarina**	**r**	**Population**	pairs	**6**	**Reach**	
A231	Coracias garullus	r	Population	pairs	Insufficient data	Insufficient data	
A113	Coturnix coturnix	r	Population	pairs	Insufficient data	Insufficient data	
A212	Cuculus canorus	c	Population	individuals	Insufficient data	Insufficient data	
A212	Cuculus canorus	r	Population	pairs	Insufficient data	Insufficient data	

A738	Delichon urbicum (urbica)	r	Population	pairs	Insufficient data	Insufficient data	
A239	Dendrocopus leucotus	p	Population	pairs	Insufficient data	Insufficient data	
A429	Dendrocopus syriacus	p	Population	pairs	Insufficient data	Insufficient data	
A236	Dryocopus martius	p	Population	pairs	Insufficient data	Insufficient data	
A447	Emperiza caesia	r	Population	pairs	Insufficient data	Insufficient data	
A379	Eperiza hortulana	r	Population	pairs	Insufficient data	Insufficient data	
A098	Falco columbarius	c	Population	individuals	Insufficient data	Insufficient data	
A100	Falco eleonorae	c	Population	individuals	Insufficient data	Insufficient data	
A095	Falco naumanni	c	Population	individuals	Insufficient data	Insufficient data	
A103	Falco peregrinus	p	Population	pairs	Insufficient data	Insufficient data	
A097	Falco vespertinus	c	Population	individuals	Insufficient data	Insufficient data	
A321	Ficedula albicollis	c	Population	individuals	Insufficient data	Insufficient data	
A320	Ficedula parva	c	Population	individuals	Insufficient data	Insufficient data	
A442	Ficedula semitorquata	r	Population	pairs	Insufficient data	Insufficient data	
A078	Gyps Fulvus	c	Population	individuals	Insufficient data	Insufficient data	
A078	Gyps Fulvus	w	Population	individuals	Insufficient data	Insufficient data	
A707	Hieraatus fasciatus (Aquila fasciata)	c	Population	individuals	Insufficient data	Insufficient data	
A092	Hieraaetus pennatus (Aquila pennata)	r	Population	pairs	6	Reach	
A439	Hippolais olivetorum	r	Population	pairs	Insufficient data	Insufficient data	
A251	Hirundo rustica	r	Population	pairs	Insufficient data	Insufficient data	
A233	Junx torquilla	r	Population	pairs	Insufficient data	Insufficient data	
A338	Lanius collurio	c	Population	pairs	Insufficient data	Insufficient data	
A338	Lannius collurio	r	Population	pairs	Insufficient data	Insufficient data	
A339	Lanius minor	r	Population	pairs	Insufficient data	Insufficient data	
A433	Lanius nubicus	r	Population	pairs	Insufficient data	Insufficient data	
A868	Leiopicus medius	p	Population	pairs	Insufficient data	Insufficient data	
A246	Lullula arborea	p	Population	pairs	Insufficient data	Insufficient data	
A242	Melanorypha calandra	r	Population	pairs	Insufficient data	Insufficient data	

A230	Merops apiaster	r	Population	pairs	Insufficient data	Insufficient data	
A073	Milvus migrans	c	Population	individuals	Insufficient data	Insufficient data	
A074	Milvus milvus	c	Population	individuals	Insufficient data	Insufficient data	
A260	*Motacilla flava*	*c*	Population	individuals	Insufficient data	Insufficient data	
A260	Motacilla flava	r	Population	pairs	Insufficient data	Insufficient data	
A077	**Neophron percnopterus**	**r**	Population	pairs	**2**	**Reach**	
A533	Oenanthe pleschanka	r	Population	pairs	Insufficient data	Insufficient data	
A337	Oriolus oriulus	c	Population	individuals	Insufficient data	Insufficient data	
A337	Oriolus oriolus	r	Population	pairs	Insufficient data	Insufficient data	
A094	Pandion haliaetus	c	Population	individuals	Insufficient data	Insufficient data	
A355	Passer hispaniolensis	p	Population	pairs	Insufficient data	Insufficient data	
A072	Pernis apivorus	r	Population	pairs	Insufficient data	Insufficient data	
A234	Picus canus	p	Population	pairs	Insufficient data	Insufficient data	
A210	Streptopelia turtur	r	Population	pairs	Insufficient data	Insufficient data	
A210	Streptocella turtur	c	Population	individuals	Insufficient data	Insufficient data	
A307	Sylvia nisoria	r	Population	pairs	Insufficient data	Insufficient data	
A228	Tachymarphis melba	r	Population	pairs	Insufficient data	Insufficient data	
A282	Turdus torquatus	c	Population	individuals	Insufficient data	Insufficient data	
Conservation objectives for the Koilada Filiouri SPA (GR1130011)							
Species referred to in par. 1 and 4 of Article 4 of Joint Ministerial Decision 2 under No 37338/1807/E.103/01.09.2010							
Code	**Name**	**Type**	**Parameter**	**Unit of measurement of parameter**	**Target Value**	**Specific target**	**Observations**
A402	Accipiter brevipes	r	Population	pairs	Insufficient data	Insufficient data	
A079	Aegypius monachus	c	Population	individuals	Insufficient data	Insufficient data	
A229	Alcedo atthis	p	Population	pairs	Insufficient data	Insufficient data	
A255	Anthus campestris	r	Population	pairs	Insufficient data	Insufficient data	
A226	Apus apus	r	Population	pairs	Insufficient data	Insufficient data	
A091	**Aquila crhysaetos**	**p**	Population	pairs	**3**	**Reach**	

A404	Aquila heliaca	c	Population	individuals	Insufficient data	Insufficient data	
A215	Bubo bubo	p	Population	pairs	Insufficient data	Insufficient data	
A087	**Buteo buteo**	**r**	Population	pairs	**12**	**Conservation**	
A403	**Buteo rufinus**	**p**	Population	pairs	**1**	**Conservation**	
A224	Caprimulgus europaeus	r	Population	pairs	Insufficient data	Insufficient data	
A031	Ciconia ciconia	c	Population	individuals	Insufficient data	Insufficient data	
A030	Ciconia nigra	r	Population	pairs	Insufficient data	Insufficient data	
A080	**Circaetus gallicus**	**r**	Population	pairs	**8**	**Conservation**	
A081	Circus aeruginosus	c	Population	individuals	Insufficient data	Insufficient data	
A082	Circus cyaneus	c	Population	individuals	Insufficient data	Insufficient data	
A083	Circus macrourus	c	Population	individuals	Insufficient data	Insufficient data	
A084	Circus pygargus	c	Population	individuals	Insufficient data	Insufficient data	
A858	Clanga clanga	c	Population	pairs	Insufficient data	Insufficient data	
A858	**Clandga pomarina**	**r**	Population	pairs	**2**	**Reach**	
A231	Coracias garrulus	r	Population	pairs	Insufficient data	Insufficient data	
A738	Delichon urbicum (urbica)	c	Population	individuals	Insufficient data	Insufficient data	
A738	Delichon urbicum (urbica)	r	Population	pairs	Insufficient data	Insufficient data	
A429	Dendrocopus syriacus	p	Population	pairs	Insufficient data	Insufficient data	
A236	Dryocopus martius	P	Population	pairs	Insufficient data	Insufficient data	
A379	Emperiza hotulana	r	population	pairs	Insufficient data	Insufficient data	
A100	Falco eleonorae	c	Population	individuals	Insufficient data	Insufficient data	
A095	Falco naumanni	c	Population	individuals	Insufficient data	Insufficient data	
A103	Falco peregrinus	p	Population	pairs	Insufficient data	Insufficient data	
A321	Ficedula albicollis	c	Population	individuals	Insufficient data	Insufficient data	
A320	Ficedula parva	c	Population	individuals	Insufficient data	Insufficient data	
A442	Ficedula semitorquata	r	Population	pairs	Insufficient data	Insufficient data	
A076	**Gypeatus barbatus**	**p**	Population	**pairs**	**1**	**Reach**	**The species has suffered a great historical decline**

							both locally and nationally. In this case, the population of the species in the SPA before the extinction was calculated as ORP. It is assumed that if anthropogenic threats (poison baits) are eliminated, there is suitable habitat and food for the SPA species. The target in an annual SPA is to increase to at least 1 pair of the species.
A078	**Gyps fulvus**	**p**	Population	**individuals**	**15**	**Conservation**	**Due to the species' biology and social lifestyle the conservation goal will be the minimum population of individuals to establish a colony. As 10% to 50% of the individuals in a colony are likely to nest, the target at the SPA level will be an increase to 15 adults of the species.**
A092	**Hieraatus pennatus (Aquila pennata)**	**r**	Population	pairs	**8**	**Reach**	
A439	Hippolais olivetorum	r	Population	pairs	Insufficient data	Insufficient data	
A251	Hirundo rustica	c	Population	individuals	Insufficient data	Insufficient data	
A251	Hirundo rustica	r	Population	pairs	Insufficient data	Insufficient data	
A338	Lanius collurio	r	Population	pairs	Insufficient data	Insufficient data	
A339	Lanius minor	r	Population	pairs	Insufficient data	Insufficient data	
A868	Leiopicus medius	p	Population	pairs	Insufficient data	Insufficient data	
A246	Lullula arborea	p	Population	pairs	Insufficient data	Insufficient data	
A230	Merops apiaster	r	Population	pairs	Insufficient data	Insufficient data	
A260	Motacilla flava	r	Population	pairs	Insufficient data	Insufficient data	
A077	**Neophron percnopterus**	**r**	Population	pairs	**2**	**Reach**	
A337	Oriulus Oriulus	r	Population	pairs	Insufficient data	Insufficient data	
A072	Pernis apivorus	r	Population	pairs	Insufficient data	Insufficient data	
A210	Streptopella turtur	r	Population	pairs	Insufficient data	Insufficient data	
A307	Sylnia nisoria	r	Population	pairs	Insufficient data	Insufficient data	

Conservation Objectives for the SPA Dadias forest - Soufli (GR111002)							
Species referred to in par. 1 and 4 of Article 4 of Joint Ministerial Decision 2 under No 37338/1807/E.103/01.09.2010							
Code	**Name**	**Type**	**Parameter**	**Unit of measurement of parameter**	**Target value**	**Specific target**	**Observations**
A402	Accipiter brevipes	r	Population	pairs	6	Reach	
A168	Acitis hypoleucos	c	Population	individuals	Insufficient data	Insufficient data	
A079	Aegypius monachus	r	Population growth rate	pairs per year	0.7	Reach	The trend of the species at local (and therefore national) level is medium and long-term positive, the conservation objective is to maintain the growth rate (0.7 pairs/year) until the population finally stabilizes and the carrying capacity of the SPA is reached.
A247	Alauda arvensis	r	Population	pairs	Insufficient data	Insufficient data	
A229	Alcedo atthis	p	Population	pairs	Insufficient data	Insufficient data	
A053	Anas platyrhynchos	r	Population	individuals	Insufficient data	Insufficient data	
A255	Anthus campestris	r	Population	pairs	Insufficient data	Insufficient data	
A226	Apus Apus	r	Population	pairs	Insufficient data	Insufficient data	
A091	Aquila chrysaetos	p	Population	pairs	4	Insufficient data	
A404	Aquila heliaca	w	Population	individuals	4	Insufficient data	
A215	**Bubo bubo**	**p**	Population	pairs	**5**	**Reach**	
A087	**Buteo buteo**		Population	pairs	**128**	**Reach**	
A403	**Buteo rufinus**	**r**	Population	pairs	**3**	**Reach**	
A243	Calandrella brachydactylla	c	Population	individuals	Insufficient data	Insufficient data	
A224	Caprimulgus europaeus	**r**	Population	pairs	Insufficient data	Insufficient data	
A031	Ciconia ciconia	r	Population	individuals	27	Reach	
A030	**Ciconia nigra**	**r**	Population	**pairs**	**32**	**Conservation**	
A080	Circaetus gallicus	r	Population	pairs	41	Reach	
A081	Circus aeruginosus	c	Population	individuals	Insufficient data	Insufficient data	
A082	Circus cyaneus	c	Population	individuals	Insufficient data	Insufficient data	

A083	Circus macrourus	c	Population	individuals	Insufficient data	Insufficient data	
A084	Circus pygargus	c	Population	individuals	Insufficient data	Insufficient data	
A859	Clanga clanga	w	Population	individuals	4	Conservation	
A858	**Clanga Pomarina**	**r**	Population	pairs	**22**	**Reach**	
A231	Coracias garullus	r	Population	pairs	Insufficient data	Insufficient data	
A113	Coturnix coturnix	r	Population	pairs	Insufficient data	Insufficient data	
A738	Delichon urbicum (urbica)	r	Population	pairs	Insufficient data	Insufficient data	
A239	Dendrocopus leucotus	p	Population	pairs	Insufficient data	Insufficient data	
A429	Dendrocopus syriacus	p	Population	pairs	Insufficient data	Insufficient data	
A236	Dryocopus martius	p	Population	pairs	Insufficient data	Insufficient data	
A026	Egretta garzetta	c	Population	individuals	Insufficient data	Insufficient data	
A447	Emperiza caezia	r	Population	pairs	Insufficient data	Insufficient data	
A379	Emperiza Hortulana	r	Population	pairs	Insufficient data	Insufficient data	
A101	Falco biarmicus	p	Population	pairs	1	Reach	
A098	Falco columbarius	c	Population	individuals	Insufficient data	Insufficient data	
A100	Falco eleonorae	c	Population	individuals	Insufficient data	Insufficient data	
A095	Falco naumanni		Population	individuals	Insufficient data	Insufficient data	
A103	Falco peregrinus	p	Population	pairs	3	*Reach*	
A099	Falco subbuteo		Population	pairs	11	Insufficient data	
A097	Falco vespertinus	c	Population	individuals	Insufficient data	Insufficient data	
A321	Ficedula albicollis	c	Population	individuals	Insufficient data	Insufficient data	
A320	Ficedula parva	c	Population	individuals	Insufficient data	Insufficient data	
A442	Ficedula semitorquata	r	Population	pairs	Insufficient data	Insufficient data	
A125	Fulica atra	r	Population	pairs	Insufficient data	Reach	
A076	**Gypaetus barbatus**		Population	pairs	**1**	**Reach**	
A078	Gyps fulvus	c	Population	individuals	115	Conservation	

A078	Gyps fulvus	p	Population	pairs	11	Insufficient data	
A075	Haliaeetus albicilla	w	Population	individuals	Insufficient data	Insufficient data	
A707	Hierraaetus fasciatus (Aqila fasciata)	r	Population	-	Insufficient data	Reach	
A092	Hierraaetus pennatus (Aquila pennata)	r	Population	pairs	24	Insufficient data	
A439	Hippolais olivetorum	r	Population	pairs	Insufficient data	Insufficient data	
A251	Hirundo rustica	r	Population	pairs	Insufficient data	Insufficient data	
A233	Junx torqilla	r	Population	pairs	Insufficient data	Insufficient data	
A338	Lanius collurio	r	Population	pairs	Insufficient data	Insufficient data	
A339	Lanius minor	r	Population	pairs	Insufficient data	Insufficient data	
A433	Lanius nubicus	r	Population	pairs	Insufficient data	Insufficient data	
A868	Leiopicus medius	p	Population	pairs	Insufficient data	Insufficient data	
A246	*Lullula arborea*	*p*	Population	pairs	Insufficient data	Insufficient data	
A242	Melanorypha calandra	r	Population	pairs	Insufficient data	Insufficient data	
A230	Merops apiaster	r	Population	pairs	Insufficient data	Insufficient data	
A875	Microcarbo pygmaeus	c	Population	individuals	Insufficient data	Insufficient data	
A073	Milvus migrans	r	Population	pairs	2	Reach	
A073	Milvus migrans	w	Population	individuals	Insufficient data	Insufficient data	
A074	Milvus milvus	c	Population	individuals	Insufficient data	Insufficient data	
A260	Motacilla flava	r	Population	pairs	Insufficient data	Insufficient data	
A077	Neophron percnopterus	r	Population	pairs	12	Reach	
A077	Neophron percnopterus	c	Population	individuals	Insufficient data	Insufficient data	
A023	Nycticorax nyctirorax	c	Population	pairs	Insufficient data	Insufficient data	
A337	Oriolus oriolus	r	Population	pairs	Insufficient data	Insufficient data	
A094	Pandion halliaetus	c	Population	individuals	Insufficient data	Insufficient data	
A355	Passer hispaniolensis	r	Population	pairs	Insufficient data	Insufficient data	
A072	Pemis apivorus	r	Population	pairs	28	Insufficient data	

A391	Phalacrocorax carbo sinensis	c	Population	individuals	Insufficient data	Insufficient data	
A234	Picus Canus	p	Population	pairs	Insufficient data	Insufficient data	
A249	Riparia riparia	r	Population	pairs	Insufficient data	Insufficient data	
A210	Streptopella turtur	r	Population	pairs	Insufficient data	Insufficient data	
A307	Sylvia nisoria	r	Population	pairs	Insufficient data	Insufficient data	
A228	Tachymarptis melba	r	Population	pairs	Insufficient data	Insufficient data	
A282	Turdus torquatus	c	Population	individuals	Insufficient data	Insufficient data	
A142	Vanellus vanellus	w	Population	individuals	Insufficient data	Insufficient data	

Legend:

Code: *The species code as indicated in the NATURA 2000 database.*

Name: *the scientific name of the species.*

Type: *The population type under which the species occurs in the SPA:*

Permanent (p): the species occurs in the locality throughout the year (non-migratory species, resident population of a migratory species).

Reproductive (r): the species uses the site for rearing offspring (e.g. breeding, nest building).

Concentration (c): the species uses the site for staging or roosting or stopping during migration or for changing plumage outside its breeding site and excluding overwintering.

Management (w): the species uses the site during the winter.

Parameter: *The parameter against which the conservation objective is defined.*

Parameter measurement unit: *The unit of measurement that specifies the parameter against which the Conservation Objective is defined.*

Target value*: The Conservation Target reference value for each species, which is the same as the Satisfactory*

Specific objective*: The action required to achieve the conservation objective.*

Comments: *Comments mainly related to derogations.*

For the Natura 2000 network sites under study (SPAs GR1110010, GR1130011, GR1110002 and BG0002019), no Management Plan has been prepared and is in force and no conservation objectives have been defined on the basis of the above mentioned Management Plans. The objective of this SEA is to assess the potential impacts of the project location on important species, conservation objectives and the integrity of Natura 2000 sites. In the absence of a management plan in force and the definition of conservation objectives for the study area and satisfactory reference values for species, the general conservation objective of the SPAs is to maintain or restore to a satisfactory conservation status the important species of Community interest of the sites, which are the main object of protection, based on the content of the Standard Data Forms for these sites.

The ecological requirements of the species and habitat types for which the Natura 2000 sites in question have been designated.

This study area does not belong to the Natura 2000 network sites of SACs or SCIs and there is no requirement, according to the SEA specifications, for further analysis of habitat types. With regard to the Natura 2000 network SPAs under study (GR1110010, GR1130011, GR1110002 and BG0002019), the ecological requirements of the species of interest (as selected in a previous section of this SEA) have been fully analyzed in a previous corresponding sub-chapter, in order to provide the reader with a more complete picture of the avifauna of the study area, In the following, the ecological requirements of the species of interest are analyzed in accordance with the "Deliverable 8 Guide to ecological requirements, threats and appropriate measures for the species of interest" of the identification of compatible activities in relation to the species of interest of the Special Protection Areas for avifauna (Dimalexis 2009), prepared by the Ministry of Environment, Spatial Planning and Public Works. - Environmental Planning Department - Environmental Planning Division, Natural Environment Management Department.

Cinereous Vulture (Aegypius monachus)

The main ecological factors for the species are the existence of forest stands of coniferous and broad-leaved trees with mature large trees with broad tops that can support the species' massive nest and suitable foraging habitat such as forest gaps with low vegetation used as pasture. Extensive livestock farming is an important food source for the species.

In more detail:

<u>Breeding habitat:</u> The species nests in old trees in sparse stands of coniferous (pine) and deciduous (oak) trees in semi-mountainous and hilly areas of low altitude (300 - 400 m). In Greece, the only colonies of the species occur in black and pine forests (Poirazidis et al. 2004).

<u>Feeding ecology:</u> The species forages either in small groups or in pairs. It feeds on corpses of medium-sized ungulates and small animals such as rabbits, which it locates at low flights (below 100 m) (Donazar 1993). The main foraging habitat of the species is semi-mountainous forests with several gaps with low vegetation.

<u>Main habitats supporting the species:</u>

- Broad-leaved deciduous forests
- Native coniferous forests

Griffon Vulture (Gyps fulvus)

Two conditions are necessary for the presence of the species in a region: a) the existence of rocky sites for nesting and b) the presence of extensive livestock breeding in the area. Open areas such as extensive grasslands and pastures are also important parameters for locating the foraging habitat.

In more detail:

Breeding habitat: The Griffon vulture nests in groups of 2-18 pairs always on rocky crags, mainly of calcareous substratum (Cramp and Simmons 1980, Donázar 1993), while on the islands several colonies are found on coastal rocks (Xirouchakis and Mylonas 2004, 2005).

Feeding ecology: Species of open areas, found in semi-mountainous and mountainous areas. (Donázar 1993, Handrinos and Akriotis 1997, Xirouchakis and Andreou 2009). Feeds exclusively on corpses of large or medium-sized animals, selecting the soft body parts (Tucker and Heath 1994, Xirouchakis 2005). Almost throughout its range in the western Palaearctic, the species follows nomadic herds in their seasonal movements, resulting in winter occurrence in semi-mountainous areas close to crops, toast or bare ground or any type of habitat as long as it is used as pasture, while in summer it is found in regulars, mountainous crops and mainly in mountain and sub-alpine pastures with livestock activity (Handrinos and Akriotis 1997; Xirouchakis and Mylonas 2004). Also, the presence of rocks and hilly areas with low vegetation facilitates the flight of the species using thermal currents.

Main habitats supporting the species:

- Sclerophyllic scrub, garrigue and maquis
- Alpine, sub-alpine and northern temperate grasslands
- Harsh soils
- Inland cliffs

Egyptian vulture (Neophron percnopterus)

The species needs rocky formations for nesting, traditional land use and extensive forms of livestock farming. Control of the use of poisoned baits is also a key factor in its presence.

In more detail:

Breeding habitat: The species nests in hollows or rock crevices although the wider nesting habitat may include wooded areas, rivers or open areas with low vegetation or crops. It nests in individual pairs or forms loose colonies (Cramp and Simmons 1980; Tucker and Heath 1994).

Feeding ecology: The species is nearly omnivorous. It feeds on the corpses of small animals and is very often seen in rubbish dumps or livestock farms where it forages for carcass remains and sheep and goat droppings (Donázar 1993; Handrinos and Akriotis 1997). Also, in the Evros region, turtles are a major food source, which it captures alive. The foraging habitat includes open dry plains with topsoil or hilly semi-steppe areas (Adamakopoulos et al. 1995).

Migration: The main migratory route is the Bosphorus straits, although several observations suggest that the species also moves through the Aegean Sea and Crete (Handrinos and Akriotis 1997).

Main habitats supporting the species:

- Steppes and dry calcareous grasslands
- Harsh soils
- Inland cliffs

Golden eagle (Aquila chrysaetos)

The presence of rocky outcrops is essential for the species as well as open areas for foraging.

In more detail:

Breeding habitat: The species mainly nests on rocks (800 - 2000 m, Handrinos 1987) although nesting has also been recorded in trees in areas with abundant food (Evros: 30%, Hallmann 1989).

Feeding ecology: The species is restricted to mountainous areas with rocky outcrops (Handrinos and Akriotis 1997). It prefers open areas with low vegetation and avoids forests, although it may be endemic to woodlands using gaps for foraging (Adamakopoulos et al. 1995). It is mainly found in mountainous and semi-mountainous areas and is often observed in the alpine zone in summer (Xirouchakis 2001). Its diet consists mainly of small and medium-sized birds and mammals (e.g., partridges, hares, rabbits, pigeons, pheasants, rabbits, but also skunks, squirrels, or foxes) and dead animals, especially in winter (Vaglianos 1981, Handrinos 1987, Hallmann 1989, Watson et al. 1993, Handrinos and Akriotis 1997).

Main habitats supporting the species:

- Sclerophyllic shrubs, garrigue and maquis
- Alpine, sub-alpine and northern temperate grasslands
- Steppes and dry calcareous grasslands
- Harsh soils
- Inland cliffs

Lesser Spotted Eagle (Clanga pomarina)

The species requires mature trees in lowland stands of deciduous or coniferous species and aquatic ecosystems with watery vegetation and wet meadows where it feeds mainly on reptiles and amphibians.

In more detail:

Breeding habitat: The nesting habitat of the Lesser Spotted Eagle includes low- to mid-elevation forest stands with deciduous and coniferous species (Svehlik and Meyburg 1979, Cramp and Simmons 1980, Adamakolpoulos et al. 1995).

Feeding ecology: The species feeds mainly in freshwater wetlands, rivers, and streams with aquatic vegetation but also in crops, grasslands and shrublands mainly with reptiles and amphibians but also micro-mammals and birds. Large insects and more rarely carrion are also part of its diet (Vlachos 1989, Zogaris et al. 2003).

Main habitats supporting the species:

- Broad-leaved deciduous forests

- Native coniferous forests
- Wet meadows
- Rivers and streams
- Standing brackish and salt water
- Parks vegetation
- Lagoons

Booted Eagle (Hieraaetus pennatus)

The species needs mature trees, in dense stands of deciduous forests with gaps, in bushes or meadows.

In more detail:

Breeding habitat: The species usually nests in trees, in lowland and semi-mountainous forests, but also in more open areas with stands of mainly deciduous trees (Tucker and Heath 1994, Ferguson Lee and Christie 2001, Bosch 2003, Bosch et al. 2005, Poirazidis et al. 2007, Gensbol and Thiede 2008).

Feeding ecology: The species forages in intra-forest interspaces and in open areas such as grasslands, Mediterranean scrub, and agricultural systems. It feeds mainly on birds but also on reptiles or mammals (Handrinos and Akriotis 1997; Garcia-Dios 2006; Palomino and Carrascal 2007).

Predation: The Eagle Owl is a key predator of offsprings and adults.

Main habitats supporting the species:

- Broad-leaved deciduous forests
- Mixed forests
- Forest boundary habitat
- Sclerophyllic shrubs, garrigue and maquis
- Shrubs and bushes
- Mesophilic grasslands

Short toed Snake Eagle (Circaetus gallicus)

The species requires mature trees in intact stands of deciduous or coniferous forest for nesting and extensive open, dry areas for foraging.

In more detail:

Breeding habitat: The species nests in large trees in mature deciduous and coniferous forests (Pinus spp. Quercus spp. Fagus spp.) in semi-mountainous and mountainous areas (Cramp and Simmons 1980, Tucker, and Heath 1994, Bakaloudis et al. 2001, Bakaloudis et al. 2005, Gensbol and Thiede 2008).

Feeding ecology: Feeds almost exclusively 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).

Predation: The Eagle Owl is reported as an important predator of the species.

Main habitats supporting the species:

- Broad-leaved deciduous forests
- Broad-leaved evergreen forests
- Mixed forests
- Native coniferous forests
- Sclerophyllic shrubs, garrigue and maquis
- Alpine, sub-alpine and northern temperate grasslands
- Dry, siliceous grasslands
- Steppes and dry calcareous grasslands
- Harsh soils
- Inland cliffs
- Stones and boulders

Black stork (Ciconia nigra)

The species nests in small numbers in Thrace, Macedonia, Epirus, North Thessaly, and Lesvos, in mature and undisturbed forests or on rocks and feeds in shallow rivers and streams, ponds, marshes and wet meadows.

In more detail:

Breeding habitat: Nests solitarily in mature, undisturbed forest, mixed or unmixed, deciduous, or coniferous woodland with clearings. The nest is a large platform constructed on trees with a flat top and a wide enough cone to hold the structure. It also nests in rocks and canyons.

Feeding ecology: Feeds in shallow rivers and streams, ponds, marshes, and wet meadows mainly on fish, amphibians, crustaceans, and aquatic insects and less on reptiles and small mammals for this reason it is more dependent on water than the white stork.

Migration habitat: The species migrates through the Bosphorus alone or in small groups and during this period may also be seen in coastal wetlands. A part of the population also migrates through the western coastline of Greece towards the southern Peloponnese - Kythera - Antikythera - Crete. Usually, the species does not stop during the migration, but only briefly in coastal wetlands. In such locations some individuals overwinter.

Main habitats supporting the species:

- Broadleaf deciduous forests
- Native coniferous forests
- Rivers and streams
- Standing freshwater forests.
- Inland cliffs

Greater Spotted Eagle (Clanga clanga)

Large wetlands with high food availability are a key ecological parameter for the species. The species is a winter visitor in Greece. The species is distributed in Thrace - Central and Eastern Macedonia, Epirus, and Central Greece, with the largest wintering populations of the species being counted in the Evros Delta, Lake Kerkini, Nestos Delta, and Amvrakikos Gulf (Handrinos and Akriotis 1997).

In more detail:

Winter habitat: The species uses for roosting and nesting lowland and riparian forests as well as eucalyptus stands near wetlands. It feeds in large wetlands and sporadically in adjacent wetland crops on waterfowl, large insects, and carrion (Alivizatos et al. 2004, Alivizatos et al. 2006).

Main habitats supporting the species:

- Constant brackish and salt water
- Lagoons

Eagle owl (Bubo bubo)

A crucial factor for the well-being of the species is the existence of rocks for nesting and open areas rich in food reserves.

In more detail:

Breeding habitat: The species nests in large rock cavities, preferring canyons, cliffs, rock formations and outcrops, with an abundance of habitat if there are abundant food resources in the area (Tucker and Heath 1994, Handrinos and Akriotis 1997).

Feeding ecology: It is a species of mainly open areas with rocks, grasslands, crops, and fallow fields. However, it is also found in shrublands and deciduous, coniferous, or mixed forest ecosystems but also in areas where there are many clearings and rocks. It is also found close to populated areas with high food supplies. Its diet includes a variety of species, but mainly rodents (rats), hedgehogs, wild rabbits and medium-sized birds, while it is considered to be a super-feeder, capturing other species (hawks, hawk eagles, peregrines, snake eagles, etc.).etc.) by surprising them at dusk when they roost, but also carnivorous mammals (e.g. foxes) (Cramp and Simmos 1980, Mikkola 1983, Papageorgiou, et al. 1993, Alivizatos et al. 2005).

Main habitats supporting the species:

- Sclerophyllic shrubs, garrigue and maquis
- Dry, siliceous grasslands
- Mesophilic grasslands
- Steppes and dry calcareous grasslands
- Harsh soils
- Inland cliff

Middle Spotted Woodpecker (Leiopicus medius)

The species prefers mature deciduous forests (mainly oak forests), riparian forests or in the case of Lesvos also olive groves. The age of the forests, their total area and their degree of isolation are important selection factors at the spatial level of the landscape. In its territories, the species selects forest sites with mature trees and a high proportion of dead trunks or old trees.

In more detail:

Breeding habitat: The species nests in cavities in old trees (> 22 cm in diameter) in an advanced stage of decay (Robles et al. 2007) or in dead webbed trunks, mainly of deciduous trees (Kosinski and Winiecki 2004). Nest height ranges from 1.3 to 4.5 m above ground level (Cramp 1998). It is observed at low altitudes in deciduous forests, especially oak forests (Pasinelli 2000), in riparian forests (e.g., hedgerows, willows, etc.), while in Lesvos, in addition to deciduous forests (oak and chestnut forests), it colonizes areas with olive groves (Handrinos and Akriotis 1997). High densities of the species are observed in riparian or waterlogged forests, probably due to the high diversity of vegetation, both in species abundance and the dense vertical structure of these forests (Kosinski and Winiecki 2005). Population density, at the spatial level of the territory, is positively related to the density of mature (large-sized) trees and the availability of old trees or dead stems (Pasinelli 2007, Muller et al. 2009, Robles et al. 2007). At the spatial landscape level, high population densities are positively related to the total area of oak woodland (secondary deciduous) and negatively related to the degree of isolation (Kosinski and Winiecki 2005, Pettersson 1985).

Feeding ecology: The species feeds almost exclusively on insects throughout the year, which it locates on the trunks, branches, and crown of trees (Cramp 1998). It feeds in mature deciduous forests on old trees with rough and uneven bark (such as oaks) where they harbor a wide variety of insects (Robles et al. 2007, Pasinelli 2000). Insect abundance strongly influences the choice of foraging sites. Thus, at the spatial level of the territory, old trees, or trees where part of the crown is dead are selected (Muller et al. 2009), while at the spatial level of the landscape, mature deciduous forests, mainly of the genus Quercus, are selected (Kosinski and Winiecki 2005). The species seems to avoid young forests, as well as conifer plantations (Kosinski and Winiecki 2004). Also, an important parameter is the high availability of dead logs both in the territory and in the total forest area (Muller et al. 2009, Pasinelli 2007).

Predation: Among juveniles, a high proportion of mortality is resigned in the first three weeks after fledging and is due to predation. After offsprings become independent from their parents, they face another critical period during the first winter, with a high mortality rate (Robles et al. 2007).

Main habitats supporting the species:

- Alluvial and hydrophytic forests
- Broad-leaved deciduous forests

European Green Woodpecker (Picus viridis)

The species prefers low-altitude areas with mature forests, mainly deciduous, adjacent to open areas e.g., clearings, meadows, crops with scattered old trees, stream tree vegetation e.g., willows, poplars. The availability of suitable trees for foraging increases with the proportion of mature forest, and 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 or fruit trees.

In more detail:

Breeding habitat: The species nests in a wide variety of tree species, in cavities opened by both sexes (Cramp 1998). Selection of suitable nesting sites is related to the presence of mature trees near areas rich in food resources (Tucker and Heath 1994). The species selects with a strong habitat mosaic, where islands of forest (mainly deciduous) alternate with hedgerows, scattered old trees, or stream vegetation in agricultural or agroforestry areas (Tucker and Heath 1994; Handrinos and Akriotis 1997). Also preferred are forests with natural openings and gaps or forest habitats with grassland. The species remains in the areas where it breeds and rarely moves more than 5 km from the breeding sites (Cramp 1998).

Feeding ecology: The species feeds, primarily on ants that it catches on the ground. Secondarily it feeds on insects that it takes from tree branches (Cramp 1998). The choice of feeding sites is related to the availability of ants. It prefers open sunny areas (e.g., meadows, clearings, etc.) near forest. In these areas, the role of grazing by livestock is important, which maintains the open structure of grasslands and interspaces (Tucker and Heath 1994).

Main habitats supporting the species:

- Ecotone of forest boundaries
- Cultivated land.
- Perennial crops, tree crops
- Urban parks and gardens

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Main habitats supporting the species:

- Ecotone of forest boundaries
- Cultivated land.
- Perennial crops, tree crops
- Urban parks and gardens

Olive tree Warbler (Hippolais olivetorum)

This species is found in areas with higher vegetation than other species of chironomid, e.g., black chironomid. The species prefers sparse oak forests (Handrinos and Akriotis 1997, Tucker and Heath 1994)

In more detail:

Breeding habitat: The species nests on branches of low trees or within dense shrub vegetation, usually at low heights from the ground (30 - 350 cm) (Cramp 1998). Breeding habitat includes sparse oak woodland and shows high population densities in suitable habitat, with several pairs congregating in small patches (Cramp 1998).

Feeding ecology: The species' diet consists primarily of insects during the breeding season, and it also feeds on fruit in the fall (Cramp 1998). It obtains its food through dense shrub vegetation and secondarily from the ground (Cramp 1998).

Main habitats supporting the species:

- Broadleaf deciduous forests
- Sclerophyll shrubs, garrigue and maquis
- Scrubs
- Cultivated land

Black eared Wheatear (Oenanthe hispanica)

Breeding habitat: The species breeds in dry open areas with scattered rocks, cobbles, rocky gullies, old mines and in areas with more vegetation, such as slopes with relatively dense maquis, vineyards, and olive groves. The species is usually found at low altitudes of up to 500 meters but has been observed in Crete reaching altitudes of up to 1,500 meters. The species builds its nest on the ground in shallow holes, under stones or in dense vegetation (Cramp and Perrins 1993, Tucker, and Heath 1994, Handrinos and Akriotis 1997).

Feeding ecology: The diet of this species consists mainly of various insects. The species usually uses supervisory sites up to three meters in height. The foraging habitat is identical to that of the nesting habitat (Cramp and Perrins 1993, Tucker, and Heath 1994).

Main habitats supporting the species.

- Sclerophyll shrubs, garrigue and maquis
- Shrublands
- Inland cliffs

Western Rock Nuthatch (Sitta neumayer)

Breeding habitat: The species breeds in rocky, mainly calcareous, areas. It builds its nest in rock recesses, even in old buildings or other human structures. The species is usually observed at low and medium altitudes in dry areas.

Feeding ecology: The diet of the species consists of insects, seeds, and snails (Cramp and Perrins 1993, Handrinos and Akriotis 1997).

Main habitats supporting the species:

- Sclerophyll scrub, garrigue and maquis
- Stone pits and boulders
- Inland cliffs

Subalpine Warbler (Curruca cantillans)

Breeding habitat: The species nests in bushes within dense vegetation, usually at low ground level (20 - 180 cm) (Cramp 1998). The species is also found at higher elevations than the Black-crowned Nightjar, colonizing areas with higher vegetation such as forests of copper pine or trachyte pine with dense understory. It prefers to live in evergreen broadleaf stands (Pistasia lentiscus, Quercus coccifera, etc.) and low, long vegetation.

Feeding ecology: Its diet consists of insects during the breeding season, and it supplements its diet with fruit in the fall (Cramp 1998). It obtains most of its food through dense shrub vegetation and secondarily from the ground (Cramp 1998).

Main habitats supporting the species:

- Sclerophyll scrub, garrigue and maquis
- Broad-leaved evergreen forests
- Shrubs and bushes

Sardinian Warbler (Curruca melanocephala)

Breeding habitat: The species nests in bushes within dense vegetation, usually at a low height from the ground (20 - 180 cm) (Cramp 1998). It prefers regulars of evergreen broadleaves (Pistasia lentiscus, Quercus coccifera, etc.) and low maquis vegetation. The territory size of the species is relatively small, ranging from 0.3 to 1.9 hectares (Cramp 1998).

Feeding ecology: Its diet consists of insects during the breeding season, and it supplements its diet with fruit in the fall (Cramp 1998). It obtains most of its food through dense shrub vegetation and secondarily from the ground (Cramp 1998).

Main habitats supporting the species:

- Sclerophyll scrub, garrigue and maquis
- Broad-leaved evergreen forests
- Shrubs and bushes

Cretzschmar's Bunting (Emberiza caesia)

This species prefers open rocky slopes with fringing or sparse maquis vegetation (Handrinos and Akriotis 1997, Brooks 1998). After the end of the breeding season (July-August) it disperses to areas with available water and rich in food resources (mainly small invertebrates). These may be streams or estuaries of small streams with available fresh water or even arable land (Kakalis 2009)

In more detail:

Breeding habitat: The species nests on the ground in suitable locations with rock and vegetation cover, usually under plants of the genus Cistus (Cramp 1998). The main nesting habitat is the fringing areas or areas with low and sparse maquis vegetation, at altitudes up to 1.000 m (Handrinos and Akriotis 1997).

Feeding ecology: Feeds mainly on seeds and small invertebrates (Cramp 1998). Open rocky slopes with sparse vegetation (mainly toadflax and low long vegetation) are the main foraging habitat of the species (Handrinos and Akriotis 1997, Brooks 1998). Also, in Lesvos, it is possible to colonise open forest areas (trachea of Pefkis) or gaps between them after fires (Kakalis E. 2009). Finally, after the breeding season (July-August), it disperses to food-rich areas in the presence of available water, such as crop borders or sites with dense stream vegetation.

Competition: the species probably develops a competitive relationship with related species, such as Emberiza cineracea and Emberiza hortulana, as it is absent or rare in areas with high concentrations of these species (Handrinos and Akriotis 1997).

Main habitats supporting the species.

- Sclerophyllic bushes, garrigue and maquis
- Dry, siliceous grasslands
- Steppes and dry calcareous grasslands

Black headed Bunting (Emberiza melanocephala)

The main habitat of the species consists of both open areas with a small amount of scrub and areas with trees or areas adjacent to forests. It is also found in open olive groves, vineyards, and fruit tree crops. The species prefers low-intensity crops in the presence of natural vegetation where food availability is high.

In more detail:

Breeding habitat: The species nests low in dense vegetation of shrubs or trees with dense crowns and has been observed in some cases nesting on the ground (Cramp 1998). The species builds its nest at elevations up to 1,200 m in all types of agricultural areas from open areas with scattered shrubs or natural vegetation to agroforestry areas with a high proportion of hedgerows, trees, or forests. Beyond cereal crops the species prefers open olive groves, vineyards, and open shrublands (Handrinos and Akriotis 1997, Tucker and Heath 1994)

Feeding ecology: The diet of this species consists mainly of seeds and invertebrates, especially during the breeding season. The species collects its food both from the ground and at the height of the bushes. The species selects low intensity cultivated areas in the presence of wild vegetation and shrubs where seed and invertebrate availability is high (Tucker and Heath 1994). Finally, it uses the tops of shrubs and trees as roosting and singing sites (Handrinos and Akriotis 1997).

Main habitats supporting the species.

- Ecotone of forest boundaries
- Shrublands

- Cultivated land.

Red backed Shrike (Lanius collurio)

The Red backed Shrike uses habitats including grasslands and pastures with scattered bushes, trees, and hedgerows, which it uses as surveillance points to locate its prey. Intensive crops are not preferred as there is not enough bushy vegetation and prey density is limited. Mild grazing favors the feeding of the Red backed Shrike. Medium-sized shrubs providing good cover are necessary for foraging. Crows are the main predators of Red backed Shrike's offsprings. The territories of the species have an average area of 1,5 ha.

In more detail:

Breeding habitat: The species nests in bushes and trees, forming an 'open cup' nest. The nest is located on average one meter above the ground. The breeding territories cover an area of approximately 1,5 ha. (Cramp and Perrins 1993, Muller et al. 2005, Tucker and Heath 1994). Reproductive success increases when the species nests relatively early in the spring, when the nest has adequate cover, and when few predators (mainly crows) are present. In contrast, reproductive success does not appear to be affected by parental age, nest height, or weather conditions (Golawski 2008, Muller et al. 2005).

Feeding ecology: The species feeds on insects (mainly beetles), other invertebrates, small mammals, birds, and reptiles in open grasslands with scattered shrubs, on slopes with long vegetation, in crops, on the edges and in forest clearings, in hedgerows and in vineyards (Cramp and Perrins 1993, Tucker and Heath 1994). It can often be found at relatively high altitudes, up to 1500 m (Handrinos and Akriotis 1997). Prey is found from exposed, relatively low elevations. The presence of thorny bushes, on which the birds pin their prey, is important. Grasslands with mild grazing have a positive effect on the foraging of Red backed Shrike. 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 shrub growth, which negatively affects foraging success (Golawski and Meissner 2008; Muller et al. 2005; Vanhinsbergh and Evans 2002). Also, grasslands and pastures are preferred over croplands due to more abundant forage (Golawski and Golawska 2008). In southern Europe, preferred habitats include grassland/cropland mosaics with scattered shrubs and firebreaks (Brambilla et al. 2007).

Competition: Intraspecific competition, as well as intraspecific predation of offsprings, influences the population density of the species (Muller et al. 2005).

Predation: Red backed Shrike offsprings are frequently preyed upon by coral reefs

Migratory habitat: Generally, the same habitats are used during migration as during the breeding season. The species feeds on other small migratory sturgeon during migration rather than storing substantial amounts of fat prior to the start of the passeriform season (Cramp and Perrins 1993).

Refueling and resting stations: it uses Aegean islands and islets as resting stations. Significantly, it is the second most frequent prey of Eleonora's Falcon during the autumn migration (Ristow et al. 1986).

Migration corridors: The Red backed Shrike is particularly abundant in Antikythera during the autumn migration period.

Main habitats supporting the species:

- Habitat of forest boundaries
- Sclerophyllic bushes, garrigue and maquis
- Shrublands
- Mesophilic grasslands
- Cultivated land.

Syrian Woodpecker (Dendrocopos syriacus)

The species prefers low-altitude areas with mature forests, mainly deciduous, adjacent to open areas e.g., clearings, meadows, crops with scattered old trees, stream tree vegetation such as willows and poplars. The availability of suitable trees for foraging increases with the proportion of mature forest, and 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 or fruit trees.

In more detail:

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

Feeding ecology: The species 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, so the species chooses complex cropping systems (e.g., perennial tree crops) adjacent to mainly deciduous forests. Plantations with conifers are usually avoided (Cramp 1998).

Main habitats supporting the species:

- Forest boundary habitat
- Cultivated land.
- Perennial crops, tree crops
- Urban parks and gardens

Ortolan Bunting (Emberiza hortulana)

This species prefers highly heterogeneous agricultural landscapes or pastures. Areas of extensive crops (mainly cereals) or grasslands alternating with forest islands, scrubland and scattered trees are the optimal habitat for the species. Meadows, pastures, and fields under fallow with the presence of plant barriers are also heavily used.

In more detail:

Breeding habitat: The species builds its nest on the ground in places with vegetation cover (Cramp 1998). It nests at the edges of fields or meadows where natural vegetation (photo-fences) or bushes are present. It has also been observed nesting in gaps or natural openings and in forest patches with agricultural or grassland areas (Handrinos and Akriotis 1997). The species prefers areas with high heterogeneity of vegetation at ground level (Vepsäläinen et al. 2005), where sites with bare ground or sparse vegetation are mixed with sites with taller vegetation e.g., bushes or trees (Berg 2008). The availability of nesting, singing and foraging sites accounts for this selection (Golawski and 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). The species benefits from small-scale fires that create openings and open spaces in areas of dense vegetation (Dale and Olsen 2002, Pons, and Bas 2005) and colonises them in a brief period of time (Pons and Prodon 1996). A typical example is the spread of the species in Catalonia, Spain, which is largely attributed to fires (Brotons et al. 2008).

Feeding ecology: The species feeds on seeds (mainly cereals or grasses) and supplements its diet with invertebrates during the breeding season. It collects its food mainly on the ground and often near 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 (Vepsäläinen et al. 2005, Berg 2008). The species also prefers grasslands, pastures, or fields under fallow in the presence of scattered shrubs, as insect and invertebrate availability is high in these areas due to the limited use of agrochemicals (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 and Prodon 1996, Dale and Olsen 2002, Brotons et al. 2008).

Main habitats supporting the species:

- Forest boundary habitat
- Dry, siliceous grasslands
- Mesophilic grasslands
- Steppes and dry calcareous grasslands
- Cultivated land.

Semicollared Flycatcher (Ficedula semitorquata)

This species prefers mature, closed deciduous forests of mainly beech, with no understorey and with high and bare trunks. It is also found in lowland areas along streams in the presence of surface water, dominated by stands of Platanus orientalis or Alnus glutinosa. In some cases, it is possible to nest near or within settlements, e.g., in central squares with mature plane trees and in the presence of water. During the breeding season it feeds on insects near the nest.

In more detail:

Breeding habitat: The species nests in natural cavities or cavities opened by woodpeckers in dead webbed trunks or dead branches, mainly of deciduous trees. The height of the nest ranges from 2.5 to 12 m above the ground (Cramp 1998). The selection of suitable nest sites is closely related to the presence of oak leaves in the area which open suitable cavities for nesting, which are colonized by the oakleaf. The species selects mature, closed deciduous (mainly beech) forests, with high and bare trunks, in the absence of understory (Handrinos and Akriotis 1997). It is also observed in lowland areas along streams, in the presence of surface water, dominated by stands of Platanus orientalis or Alnus glutinosa (Tucker and 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 and Heath 1994). In suitable habitats population density is high as neighboring pairs may nest on average within 70 m of each other (Cramp 1998).

Feeding ecology: The species feeds on insects which it catches in flight (Cramp 1998). During the breeding season the species feeds near the nest. This leads to the selection of sites with high insect abundance. For this reason, in lowland areas it feeds in streams in the presence of water and mature forest as the availability of insects in these areas is particularly high (Tucker and Heath 1994). At the spatial level of the landscape, mature forests with a high proportion of deciduous species (especially beech) are preferred.

Competition: the species develops intense competition for nesting habitat with other species that colonize woodpecker nesting sites, such as Tits, Eurasian Nuthatch and Treecreeper (Cramp 1998).

Main habitats supporting the species:

- Alluvial and waterlogged forests
- Broad-leaved deciduous forests

Tawny Owl (Strix aluco)

The species requires mature trees where it nests or roosts during the day and dense forest stands in a mosaic of habitats including peri-urban forests or tree plantations.

In more detail:

Breeding habitat: The Tawny Owl nests in tree cavities in a variety of forest ecosystems, but also in urban parks near human settlements or tree farms (Cramp and Simmons 1980, Mikkola 1983, Tucker and Heath 1994).

Feeding ecology: It feeds primarily on small mammals and small birds although amphibians as well as insects may be an important part of the diet in areas where they are abundant (Manganaro et al. 2001, Sunde and Bølstad 2004, Solonen and Ursin 2008). Hunting habitat includes a variety of forest ecosystems and shrublands from lowland areas to the forest edge of the alpine zone (Petty 1999, Capizzi 2000).

Main habitats supporting the species:

- Broad-leaved deciduous forests
- Broad-leaved evergreen forests
- Mixed forests
- Native coniferous forests
- Mixed forests
- Shrublands

Eastern Bonelli's Warbler (Phylloscopus bonelli orientalis)

Breeding habitat: The species nests on the ground under dense vegetation so that the nest is completely covered (Cramp 1998). It breeds in forests at high altitude (up to 1800 m), while in Thrace it is also observed at low altitudes (from 200 m upwards) (Handrinos and Akriotis 1997). It prefers broad-leaved oak and beech forests but is also observed in coniferous forests (Cramp 1998). It remains unclear whether it prefers stands of forest with a rich understory or not as in some countries the former is the case and in others the latter (Cramp 1998).

Feeding ecology: The species feeds on insects and other invertebrates, which it finds in the crown of trees, usually on the outer branches (Cramp 1998). In suitable and rich habitats, it breeds at high densities with neighboring pairs only 50-100 m apart (Cramp 1998).

Main habitats supporting the species:

- Broadleaf deciduous forests
- Native coniferous forests

Eastern Orphean Warbler (Curruca crassirostris)

This species is found in areas with higher vegetation than other species of terns. It prefers tall (2-3 m) and sparse shrubs of evergreen broadleaves mixed with oaks and hedgerows and tall trees in extensive crops or meadows (Handirnos and Akriotis 1997).

In more detail:

Breeding habitat: The species nests on branches of low trees or within dense shrub vegetation, usually at low ground level (30-350 cm) (Cramp 1998). It breeds in areas with higher vegetation compared to some species of warbler e.g., Sardinian warbler. Prefers tall (2-3 m) and sparse stands of evergreen broadleaf shrubs mixed with oaks and hedgerows and tall trees in extensive crops or pastures. The range size of the species is quite large and usually adjacent ranges are 300-400 m apart (Cramp 1998).

Feeding ecology: The species' diet consists of insects during the breeding season and supplements its diet with fruit in the fall (Cramp 1998). It obtains most of its food through dense shrub vegetation and secondarily from the ground (Cramp 1998).

Migration interval: During fall migration, the species feeds on fruit, especially figs (Cramp 1998), and prefers locations where surface water is available. It is possible that the availability of food and surface water is a limiting factor during autumn migration, particularly on the Aegean islands.

Main habitats supporting the species:

- Broad-leaved deciduous forests
- Sclerophyllic bushes, garrigue and maquis
- Shrublands
- Cultivated land.

Eastern Imperial Eagle (Aquila heliaca)

The species needs mature trees in sparse lowland forest stands and a mosaic of habitats with open areas or crops where it forages.

In more detail:

Breeding habitat: The species nests in trees, mainly pine (Pinus brutia) but also oak (Quercus spp.) in sparse lowland forests of relatively low altitude (<500 m). However, nests of the species in Europe have been recorded at altitudes of 200-1000 m. (Tucker and Heath 1994, Ferguson - Lees and Christie 2001).

Feeding ecology: The species feeds on a variety of birds and mammals as well as reptiles such as lizards and turtles. However, its main food species are those that are usually abundant in its territory. For example, in the Evros region, European ground squirrels (Spermophilus citellus) are its main prey as well as domestic species such as chickens. The species also feeds on dead animals, especially in winter. Its foraging habitat consists mainly of lowland forests with clearings and crops or bare rocky areas and riparian ecosystems (Handrinos and Akriotis 1997; Katzner et al. 2006; Gensbol and Thiede 2008).

Main habitats supporting the species:

- Broadleaf deciduous forests
- Native coniferous forests
- Forest boundary habitat
- Shrublands
- Mesophilic grasslands
- Woodland vegetation

- Cultivated land.

Osprey (Pandion haliaetus)

Breeding habitat: The species nests in trees in riparian forests or thickets near large wetlands with rich fish stocks and on the ground on islands and coastal rocks on some Mediterranean islands (Cramp and Simmons 1980; Moson 2001; Casado and Ferrer 2005; Dennis 2007).

Feeding ecology: The foraging habitat of this species includes all types of natural or artificial wetlands provided there is abundant food (Francour and Thibault 1996, Casado and Ferrer 2005, Watts and Paxton 2007, Castellanos-Vera and Rivera 2007, Marquiss et al. 2007).

Main habitats supporting the species:

- Stagnant brackish and saltwater
- Permanent freshwater
- Lagoons
- Salt marshes

Western Marsh Harrier (Circus aeruginosus)

The existence of reedbeds and wetland ecosystems with abundant food (reptiles, amphibians, and birds) is a key ecological factor for the species.

In more detail:

Breeding habitat: The species nests on the ground, preferring extensive reedbeds (Cramp and Simmons 1980; Ferguson-Lee and Christie 2001; Nemeckova et al. 2008).

Feeding ecology: Feeds on small mammals and birds as well as reptiles, amphibians, and fish. Its foraging habitat includes wetland systems for almost all species (Tucker and Heath 1994, Gensbol and Thiede 2008).

Main habitats supporting the species:

- Wet grasslands
- Alkaline peatlands and swamps, transitional marshes, and springs
- Stagnant brackish and salt water
- Volatile freshwater
- Land vegetation.
- Lagoons
- Salt marshes

Hen Harrier (Circus cyaneus)

The main ecological factor for this species is the existence of marshes and open areas.

In more detail:

Breeding habitat: The habitat of the species is marshes with low vegetation, grasslands, and generally open areas. It is also found in brushwood ecosystems even at high altitude (in winter and during autumn migration). It feeds on small birds, small mammals, reptiles, and insects (Cramp and Simmons 1980, Ferguson-Lee, and Christie 2001, Leckie et al. 2008, Arroyo et al. 2009).

Main habitats supporting the species:

- Sclerophyllic scrub, garrigue and maquis
- Alpine, sub-alpine and northern temperate grasslands
- Mesophilic grasslands
- Alkaline peatlands and swamps, transitional marshes, and springs
- Cultivated land.

Montagu's Harrier (Circus pygargus)

Cereal crops are the most important nesting habitat for this species.

In more detail:

Breeding habitat: The species always nests (often in loose colonies) on the ground in mainly cereal crops but it is very likely that it also nests in subalpine grasslands (Cramp and Simmons 1980, Ferguson-Lee, and Christie 2001, Gensbol and Thiede 2008, Wiacek 2008).

Feeding ecology: The species feeds on small birds, rodents but also reptiles and insects. Foraging habitat includes crops and grasslands although it is also observed in wetlands and coastal areas with sand dunes, especially during migration (Johnson and Igl 2001, Gensbol and Thiede 2008, Trierweiler et al. 2008).

Main habitats supporting the species:

- Cultivated land.

Pallid Harrier (Circus macrourus)

The main ecological factor for this species is open dry land.

In more detail:

Migratory habitat: The habitat includes open lowland areas with low vegetation and is not so dependent on the availability of water. It feeds on small birds, small mammals, reptiles, and insects (Cramp and Simmons 1980; Ferguson-Lee and Christie 2001; Leckie et al. 2008; Arroyo et al. 2009).

Main habitats supporting the species:

- Sclerophyllic scrub, garrigue and maquis
- Alpine, sub-alpine and northern temperate grasslands
- Mesophilic grasslands
- Alkaline peatlands and swamps, transitional marshes, and springs
- Cultivated land.

Levant Sparrowhawk (Accipiter brevipes)

The presence of tall trees or shrubs in deciduous forests and forest gaps with grasslands or rivers and streams rich in riparian and aquatic vegetation are key ecological factors for the species.

In more detail:

Breeding habitat: Typical woodland species. It nests in trees, preferring mainly deciduous forests with many clearings and river valleys with tall trees or shrubs (Gensbol and Thiede 2008). It often breeds singly in trees near crops or rivers and even in forest plantations (e.g., whitewood plantations) (Tucker and Heath 1994).

Feeding ecology: The species feeds mainly on small mammals, birds, reptiles, and large flying insects (e.g., grasshoppers, cicadas, etc.) which it preys in forest clearings, or in the nearest fields and meadows, as well as near the riverbed in riparian vegetation (Gensbol and Thiede 2008).

Main habitats supporting the species:

- Alluvial and hydric forests
- Broad-leaved deciduous forests
- Wet meadows
- Mesophilic grasslands
- Rivers and streams
- Parks vegetation

European Honey Buzzard (Pernis apivorus)

The maintenance of mature trees and forest clearings is vital for the conservation of the species.

In more detail:

Breeding habitats: Typically, a forest-dwelling species, nesting in mature trees of mostly deciduous forests (Cramp and Simmons 1980, Amcoff et al. 1994, Tucker and Heath 1994).

Feeding ecology: Hunting habitat includes a variety of forest ecosystems (deciduous, coniferous, e.g., Quercus spp., Pinus spp., Fagus spp.) but with the basic requirement of clear and open stands and extensive plots where it hunts for food. Its diet consists mainly of insects (bees and wasps) but also reptiles, mammals, birds, and fruits (Voskamp 2000, Ferguson-Lee and Christie 2001, Gensbol and thiede 2008).

Main habitats supporting the species:

- Broad-leaved deciduous forests
- Broad-leaved evergreen forests
- Mixed forests
- Native coniferous forests
- Forest boundary habitat

Black Kite (Milvus migrans)

The basic conditions for the presence of this species are the existence of mature trees for nesting and the abundance of food.

In more detail:

Breeding habitats: The species nests in trees in stands of deciduous and coniferous forests (Cramp and Simmons 1980; Ferguson-Lee and Christie 2001).

Feeding Ecology: The species feeds on a wide variety of species such as small mammals, birds, reptiles, fish, insects and corpses or garbage. Hoarding species that frequents dumpsites and near paddocks where it feeds on garbage or copepod insects (e.g., beetles). Hunting habitat includes open areas such as wetlands, crops, meadows, and grasslands as well as bare ground usually in lowlands and valleys (Sergio and Boto 1999, Sergio et al. 2002, Palomino and Carrascal 2007, Gensbol and Thiede 2008).

Main habitats supporting the species:

- Broadleaf deciduous forests
- Native coniferous forests
- Sclerophyllic bushes, garrigue and maquis
- Shrubs and bushes
- Dry, siliceous grasslands
- Steppes and dry calcareous grasslands
- Standing fresh water
- Cultivated land.
- Other urban and industrial areas
- Landfills

Long legged Buzzard (Buteo rufinus)

The species needs a mosaic of habitats, such as steep cliffs and bare ground or dry steppe meadows.

In more detail:

Breeding habitat: The species always nests on rocks in forest clearings or at the edges of forest stands but mainly in open areas with rocky formations (Cramp and Simmons 1980; Alivizatos 1996; Alivizatos and Goutner 1997).

Feeding ecology: The species is a predator of open areas with bare ground and low vegetation. Foraging habitat includes steppe, semi-arid areas with brushwood vegetation where it feeds primarily on reptiles and less so on birds (Cramp and Simmons 1980, Alivizatos 1996, Alivizatos and Goutner 1997).

Predation: Predation pressure from Bubo bubo (Bubo bubo) is reported in some territories.

Main habitats supporting the species:

- Steppes and dry calcareous grasslands
- Steep and rocky coasts
- Infertile lands
- Inland cliffs

Bonelli's Eagle (Aquila fasciata)

The presence of rocks and open areas with bare ground and toasty grasslands with medium sized mammals and birds are very important nesting and feeding habitats.

In more detail:

Breeding habitat: It always nests on rocks either on inland cliffs or in coastal areas over the sea (Cramp and Simmons 1980; Ferguson-Lee and Christie 2001; Gensbol and Thiede 2008; Bourdakis and Xirouchakis 2009).

Feeding ecology: The species in Greece is found in Mediterranean, island ecosystems. The foraging habitat of the species includes mainly toast and scrubland with long vegetation and young sparse forests near cultivated areas or wetlands. It feeds on medium-sized mammals and birds and to a lesser extent on reptiles, and lizards (Handrinos Akriotis 1997; Alivizatos and Bourdakis 2002; Carrete et al. 2002; Sanz et al. 2005; Bourdakis and Xirouchakis 2009).

Main habitats supporting the species:

- Sclerophyllic bushes, garrigue and maquis
- Shrubby bushes
- Rocky columns and islands
- Cliffs and rocky shores
- Infertile lands

White tailed Eagle (Haliaeetus albicilla)

This species needs mature trees in riparian forests near large wetlands for food (i.e., aquatic populations).

In more detail:

Breeding habitat: The species nests in trees, primarily in lowland and riparian forests and broadleaf deciduous forests (Cramp and Simmons 1980; Ferguson-Lees and Christie 2001).

Feeding Ecology: Feeds on aquatic and wading birds, fish and to a lesser extent mammals. In winter part of its diet consists of corpses (Selva et al. 2005). Its foraging habitat is large wetland systems such as lakes, deltas, and riparian forests (Tucker and Heath 1994; Zawadzka 1999; Sulkava et al. 1997; Gensbol and Thiede 2008; Radovic and Mikuska 2009).

Main habitats supporting the species:

- Broadleaf deciduous forests
- Native coniferous forests
- Standing brackish and saltwater forests.
- Perennial freshwater
- Lagoons
- Salt marshes
- Tidal zone of rivers and tidal water bodies

Lesser Kestrel (Falco naumanni)

The species requires the presence of rocky outcrops and old houses and open areas with low vegetation or bare ground and unirrigated crops.

In more detail:

Breeding habitat: The species is purely colonial and nests in villages and settlements in old houses and rubble in rural areas in cracks or under roofs (Vlachos et al. 2004).

Feeding ecology: The species prefers open areas with low vegetation and bare ground, as well as grasslands, and hunts almost exclusively in rural areas with dry insect crops (Vlachos et al. 2003; Ursúa et al. 2005; Gensbol and Thiede 2008).

Predation: crows are considered predators of the eggs and offsprings of the common Lesser Kestrel.

- Main habitats supporting the species:
- Dry siliceous grasslands
- Cultivated land.
- Other urban and industrial areas
- Infertile Land

Red footed Falcon (Falco vespertinus)

Migration habitat: the Red footed Falcon prefers open areas with crops, grassland and Mediterranean topsoil and maquis, where it feeds mainly on insects, and captures reptiles and, less frequently, small worms (Cramp and Simmosn 1980, Hölzinger 1987, Gensbol and Thiede 2008).

Main habitats supporting the species:

- Sclerophyllic shrubs, gorges, and maquis
- Shrublands
- Mesophilic grasslands
- Cultivated land.
- Perennial crops, tree crops
- Infertile Land

Peregrine Falcon (Falco peregrinus)

This species requires the presence of suitable rocks for nesting and good populations of certain species for feeding.

In more detail:

Breeding habitat: The species nests on steep vertical cliffs in canyons and coastal cliffs. The nest is in small cavities or terraces usually with rocky roofs (Newton 1979, Tucker, and Heath 1994, Rizzolli et al. 2005).

Feeding ecology: The species feeds on a wide variety of species the majority of which are birds (Ratcliffe 1993, Gensbol and Thiede 2008). However, it feeds mainly on species that are abundant in its range (Jenkins and Avery 1999). For example, inland, partridges and small to medium sized birds form the species' diet, while on islands, rock doves are its main food item. In contrast, in cities it preys mainly on pigeons and collar doves (Sielicki and Mizera 2009).

Competition: theoretically the species competes with the lanner falcon for nesting sites and does not occur on adjacent rocks.

Main habitats supporting the species:

- Sclerophyllic scrub, garrigue and maquis
- Dry, siliceous grasslands
- Steppes and dry calcareous grasslands
- Rocky columns and islands
- Steep and rocky coasts
- Inland cliffs

Eleonora's Falcon (Falco eleonorae)

The species requires rocky islets with vertical, steep cliffs and intense migratory activity of small birds in the area during the autumn period. Good wind conditions are an essential prerequisite for the breeding success of the species.

In more detail:

Breeding and feeding habitat: The species nests on isolated Aegean islands with steep coastal cliffs in crevices and cavities, but also on the ground under large rocks or bushes (Walter 1979, Handrinos and Akriotis 1997). The largest colonies of the species coincide with the main migration routes in the Aegean Sea and found on inhabited islands (Dimalexis et al. 2007).

Competition: predation of eggs by rats who are present on Aegean rocky islets is a major problem. On uninhabited islands has been estimated that 30% of eggs are predated (Ristow and Wink 1985).

Main habitats supporting the species:

- Open seas
- Rocky shores and islands
- Steep and rocky coasts

Merlin (Falco columbarius)

Hibernation habitat: species of open areas, frequenting dry crops (mainly cereals), brushwood and grassland, but also wetlands. It feeds mainly on small mammals and insects (Fergusoin Lees and Christie 2001; Gensbol and Thiede 2008).

Main habitats supporting the species:

- Sclerophyllic scrub, gorges, and maquis
- Shrublands
- Dry, siliceous grasslands
- Mesophilic grasslands
- Steppes and dry calcareous grasslands
- Cultivated land.

White stork (Ciconia ciconia)

The species breeds mainly in Northern Greece, in the countryside and in urban areas near feeding areas or at distances of up to 2-3 km. It feeds in shallow standing water in lagoons, ponds, gullies, marshes, and in flooded areas, wet meadows, and dry crops during migration. The species migrates via Thrace - Central Asia, while a smaller part of the population is concentrated as far as Attica from where they cross the Aegean Sea to reach the Asia Minor coast. A third, even smaller part of the population of the species ends up, mainly via the western coastline, in the southern Peloponnese - Kythera - Antikythera - Crete and then in Africa.

In more detail:

Breeding habitat: The nest is constructed in the countryside and in urban areas on a platform with branches and is usually placed up to 30 m above ground on trees, roofs, pillars, posts and other man-made structures and specially constructed artificial nests. The species nests solitarily or in loose colonies, in traditional locations and often in the same nests. Nests are made near feeding areas, or at distances of up to 2-3 km.

Feeding ecology: Feeds solitarily or in flocks when food is abundant, during the day, in shallow standing water in ponds, gullies, marshes, with aquatic organisms (fish, amphibians, molluscs, crustaceans) and in flooded areas, wet meadows and crops with insects or mice. In some areas (Thessaly, Central Macedonia) it feeds largely on cereal crops, pastures, and other areas away from water.

Migration habitat and resting and refuelling stations: During migration, the species is found in open areas with shallow standing water, lagoons, ponds, reservoirs, gullies, swamps, flooded areas, wet grasslands, and crops. During most of their migration within the country, the species does not stopover in large numbers. More significant concentrations are observed in eastern Thrace and in some parts of Attica, where flocks congregate in bare fields before moving on.

Migration routes: the species migrates by taking advantage of upward currents over the continental shelf, therefore avoiding open sea areas, and limiting itself to narrow crossings. In Greece, most storks migrate via Thrace – Asia Minor. A smaller part of the population is concentrated as far as Attica from where they cross the Aegean Sea to reach the Asia Minor coast. A third, even smaller part of the population of the species ends up, mainly via the western coastline, in the southern Peloponnese - Kythera - Antikythera - Crete and then in Africa.

Main habitats supporting the species:

- Wet grasslands
- Mesophilic grasslands
- Standing fresh water.
- Cultivated land.
- Other urban and industrial areas
- Urban parks and gardens
- Artificial landscapes (aquatic)

The species **Boreal Owl (Aegolius funereus)** and **Red Kite (Milvus milvus)** are not mentioned in the above deliverable. The main characteristics of the above species, as well as their ecological requirements, have been reported in Section 5, in the relevant subsection required.

The species of interest are then grouped according to their ecological requirements in accordance with "Deliverable 2 Grouping of species of interest according to their ecological requirements" of the identification of compatible activities in relation to the species of interest of the Special Protection

Areas for avifauna (Dimalexis 2009), prepared by the Ministry of Environment and Spatial Planning - Environmental Planning Division, Department of Natural Environment Management. Table 24 below gives the grouping of the species of interest and then a more detailed description of each group according to the ecological requirements of the species.

Table 23: *Categorization of species of interest into groups according to their ecological requirements.*

Category	**Species**
Big predators	*Aegypius monachus, Neophron percnopterus, Buteo rufinus, Gyps fulvus, Haliaeetus albicilla, Hieraaetus pennatus, Aquila chrysaetos, Circaetus gallicus, Clanga pomarina, Clanga clanga, Aquila heliaca, Circus aeruginosus, Circus cyaneus, Circus macrourus, Circus pygargus, Milvus migrans, Accipiter brevipes, Pandion haliaetus, Pernis apivorus, Aquila fasciata, Milvus milvus*
Ardeidae– Ciconiiformes	*Ciconia nigra, Ciconia ciconia*
Falconidae	*Falco naumanni, Falco peregrinus, Falco columbarius, Falco vespertinus, Falco eleonorae*
Nocturnal	*Bubo bubo, Strix aluco, Aegolius funereus*
Interforestry	*Dendrocopos syriacus, Picus viridis, Leiopicus medius, Phylloscopus orientalis, Ficedula semitorquata*
Types of agro-pasture ecosystems	*Lanius collurio, Oenanthe hispanica, Emberiza hortulana, Curruca crassirostris, Curruca cantillans, Curruca melanocephala, Hippolais olivetorum, Sitta neumayer, Emberiza caesia, Emberiza melanocephala*

<u>Big predators</u>

In this category, the most used habitats include both open and forested areas. Deciduous and coniferous forests are nesting habitats for many species, but also foraging habitats for many of them. Rocky slopes in the inland and coastal environment play a significant role in the ecology of these species, as they are important nesting habitat for many species. Open areas, such as areas with maquis vegetation and cultivated land, are mainly the main habitats of large predators. Also, some species such as harriers feed in wetlands. The diet of large predators includes mainly mammals and birds, and some species are scavengers. Several species in this category are migratory.

<u>Ardeidae– Ciconiiformes</u>

This category includes herons, storks, pelicans, etc. A common characteristic of the majority of these species, apart from their direct association with the aquatic element, is the fact that they breed in colonies in trees close to their feeding areas, as a consequence of the above, in addition to wetland habitats (standing fresh and salt water, wet meadows, salt marshes, lagoons, reed beds), very important habitats are also aluvic and hydrophytic forests, which are also the main breeding and nesting habitats.

Interforestry

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. Except for the two species of flycatcher (Ficedula sp.) and Bonelli’s warbler (Phylloscopus bonelli), the other species are non-migratory.

Types of agro-pasture ecosystems

This category includes species native to open areas (typical Mediterranean landscape species (maquis and toadflax) such as Lanius sp.). Also, they are included agricultural species and those of alpine grasslands. The main habitats for species in this category are cultivated land, grasslands (mesophilic, dry, alpine), areas with topsoil and maquis vegetation, scrubland, inland cliffs, etc. Most species nest on the ground or in bushes, and this category also includes swallows and swifts, which use buildings for nesting. The food of these species includes insects, seeds, and fruits.

Falconidae

Hawks use open areas such as grasslands, scrubland, and farmland for feeding. Rocky slopes are their main foraging habitat, with some species preferring coastal rock formations (Falco eleonorae, partly Falco peregrinus). A special case is the Lesser 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.

Nocturnal

This category includes species that breed and feed in open areas, but also in more wooded areas (e.g., Strix aluco). Also, some species, such as the owl, often breed near human presence. Nocturnal predators feed on small mammals and birds and are all non-migratory.

The conservation status of the above species and habitat types at national and European level

They have been discussed in the corresponding chapters.

Threats and risks of degradation, destruction, or nuisance

This study area does not belong to the Natura 2000 network sites of the SAC-SCI network and there is no requirement, according to the SEA specifications, for further analysis of habitat types. With regard to the Natura 2000 network SPAs under study (GR1110010, GR1130011, GR1110002 and BG0002019), the threats to the species of interest (as selected in a previous section of this SEA) have been fully analyzed in a previous corresponding sub-chapter, in order to provide the reader with a more complete picture of the avifauna of the study area, then the threats to the species of interest are analyzed in accordance with the "Deliverable 8 Guide to ecological requirements, threats and appropriate measures for the species of interest" of the identification of compatible activities in relation to the species of interest of the Special Protection Areas for avifauna (Dimalexis 2009), prepared by the Ministry of Environment, Spatial Planning and Public Works. - Department of Environmental Planning Department of Natural Environment Management.

Cinereous Vulture (Aegypius monachus)

The use of baits to control carnivorous mammals and the destruction of forest stands of mature trees is a primary threat. In addition, the abandonment of traditional farming methods, the reduction of forest buffers due to undergrazing and disturbance due to logging or forest recreation activities further contribute to the decline of the species.

In particular:

Threats to breeding habitat: The destruction of upland forests and the lack of stands of old trees are a major threat to the species. In addition, disturbance during the nesting season due to logging activities plays a vital role in the reproductive failure of the species (Adamakopoulos et al. 1995).

Threats to foraging habitat: Afforestation, deforestation of sparse stands, undergrazing and abandonment of extensive livestock farming are the most important threats to the foraging habitat of the species.

Direct threats: The use of poisoned baits to control the wolf in mainland Greece played a key role in the extinction of the species (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 previous decade (Antoniou et al. 1996, Skarti et al. 2008). Also, in the same area the siting and operation of wind farms is a threat that needs to be monitored (Ruiz et al. 20005). Poaching, although a potential threat to the species, is of minor importance.

Vulture (Gyps fulvus)

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 played a decisive role in the decline of the species in mainland Greece.

In more detail:

Threats to breeding habitat: Destruction or degradation of the species' nesting habitat occurs through development infrastructure (construction of roads, settlements, winter tourism facilities) and mining and quarrying activities (Tucker and Heath 1994; Slotta-Bachmayr et al. 2004).

Threats to foraging habitat: A key threat to the species is the abandonment of traditional livestock husbandry and grazing practices, upland farming, and land use changes in natural agroecosystems (Slotta-Bachmayr et al. 2004).

Direct threats: A critical factor in the extinction of the species is secondary poisoning, the result of the illegal use of baits to control carnivorous mammals considered "noxious" in agriculture and livestock production, the main representative being the wolf (Canis lupus). Poaching and taxidermy are a problem but to a lesser extent and are found in some areas of mainland Greece and Crete. Other sources of mortality include drowning at sea, in irrigation reservoirs or in open sewage disposal tanks (e.g., olive oil waste), electrocution, collision with power lines and killing in wind turbine blades. The use of antibiotics or other veterinary drugs is a significant threat to vultures, but this needs to be investigated for Greece (Bourdakis et al. 2004, Xirouchakis 2004).

Egyptian vulture (Neophron percnopterus)

The abandonment of traditional livestock farming, the closure of landfills and the use of poisoned baits are the most critical factors in the decline of the species.

In more detail:

Threats to breeding habitat: The species shows considerable tolerance to human presence (Mundy et al. 1993). However, elevated levels of disturbance in nesting territory are a key requirement for reproductive success of pairs nesting on low cliffs (Ceballos and Donazar 1989; Tucker and Heath 1994).

Threats to foraging habitat: The intensification of livestock production and modern animal husbandry techniques deprive the species of important food sources. Also, disappearance of some large colonies and the abandonment of some territories in Central Greece coincided with the closure of nearby landfills and landfilling (Xirouchakis and Tsiakiris 2009).

Direct threats: Direct killing by humans and the use of poisons for pest control are considered among the main causes of species decline. The latter threat is consistently present throughout its distribution range and is the first cause of mortality for the species. Livestock drugs, heavy metals and antibiotics have also been underestimated and appear to play a significant role in the species' population decline (Tucker and Heath 1994; Hernadez and Margalida 2008).

Black stork (Ciconia nigra)

A critical factor is the degradation of the species' nesting habitats due to deforestation, the opening of forest roads in inaccessible forest areas and consequent disturbance, as well as the felling of large mature or dead trees in which it nests. Regarding feeding and staging habitats, critical factors include drainage of seasonal freshwater ponds and marshes, use of agrochemicals, straightening, encapsulation of rivers and streams, pollution, and general degradation of small streams in semi-mountainous areas.

The species is probably the most directly threatened species of the Greek avifauna by the construction of dams and small hydroelectric projects. The Black Stork is recorded as a victim of poaching and collision with power lines.

In more detail:

<u>Threats to breeding habitat</u>: Threats to the species are recorded as degradation of forest nesting habitat due to deforestation, the opening of forest roads in inaccessible areas, and the felling of large mature or dead trees in which the species builds its nest.

<u>Threats to foraging habitat</u>: Drainage of seasonal freshwater ponds and marshes, small coastal wetlands, and the use of agrochemicals (Birdlife International 2008).

<u>Direct threats:</u> Poaching and collision with power lines (Birdlife International 2008).

Lesser Spotted Eagle (Clanga pomarina)

The destruction of mature trees and the degradation and shrinkage of wetlands are the main causes of the species' population decline.

In more detail:

<u>Threats to breeding habitat</u>: The species is mainly threatened by deforestation and the destruction of mature trees in lowland areas. In addition, disturbance due to human activities in lowland forests results in a reduction in the species' reproductive success (Tucker and Heath 1994; Lohmus 2005).

<u>Threats to foraging habitat:</u> Destruction of wading vegetation, conversion of wet grasslands to cropland, and use of agrochemicals are the primary causes of degradation of the species' foraging habitat.

Snake eagle (Circaetus gallicus)

Habitat destruction and abandonment of traditional land uses are the main threats to the species.

In more detail:

<u>Threats to breeding habitat</u>: Destruction of mature forests, fires, and disturbance due to the opening of forest roads as well as logging and recreation are the main threats to the species' breeding habitat.

<u>Threats to foraging habitat:</u> Afforestation of open lands, undergrazing, abandonment of traditional grazing systems and upland crops, and intensification of agriculture are the main threats to the species' foraging habitat. Also, the use of insecticides and pesticides reduce the availability of its food.

<u>Direct threats:</u> Poaching is an additional threat, especially during the migration season.

Golden eagle (Aquila chrysaetos)

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

In more detail:

Threats to breeding habitat: Disturbance near nesting sites is the main threat to the species' nesting habitat. Also, tourism development of mountainous areas (e.g., ski resorts) degrade many of the nesting sites due to extensive disturbance (Cramp and Simmosn 1980, Watson 1997, Kaisanlahti-jokimäki et al. 2008).

Threats to foraging habitat: Degradation of foraging habitat (e.g., abandonment of upland crops), and over-exploitation of some key food species such as partridge and hare (Xirouchakis 2001). Also, extensive reforestation and natural afforestation of abandoned lands have negative effects on the foraging habitat of the species (Watson 1997). In central Greece, quarries are also causing the destruction of the species' habitat.

Direct threats: The main threats to the species are poaching (especially in Crete where for this reason immature individuals are observed in 1/3 of pairs), and in mainland Greece the uncontrolled and illegal use of poisoned baits to control "harmful" carnivorous mammals.

Booted eagle (Hieraaetus pennatus)

The removal of mature trees and the degradation or destruction of lowland forests are the main threats to the species.

In more detail:

Threats to breeding habitat: Destruction of forests, especially lowland forests, is the main threat to the species' nesting habitat. In addition, the use of agrochemicals has serious impacts on breeding success (Suarez et al. 2000, Martinez-Lopez et al. 2007, Martinez-Lopez et al. 2009)

Threats to foraging habitat: Habitat degradation mainly due to forest destruction attributed to agriculture and residential development is the most serious threat to the species' foraging habitat (Martinez et al. 2006).

Spotted eagle (Clanga clanga)

Threats to breeding habitat: The destruction, shrinkage, and degradation of the country's large wetlands (Chandrinos 1992)

Direct threats: Poaching and possibly the use of poisoned baits

Eurasian Eagle Owl (Bubo bubo)

Disturbance near nesting sites and degradation of feeding areas through expansion and intensification of agriculture are the main threats to the species.

In more detail:

Threats to breeding habitat: The main threat to the species' nesting habitat is disturbance during the breeding season. Another threat is the destruction or degradation of nesting habitat, especially in lowland areas with high urbanization.

Threats to foraging habitat: Changes in land use such as the conversion of grassland to intensive monoculture. Also, the preservation of clearings and bare ground seem to favor the species. Finally, overcrowding of certain key food items such as wild rabbits and the use of agrochemicals for rodent control degrade foraging habitat and affect reproductive success.

Direct threats: Poisoning due to the use of miticides for rodents and rabbits and collision with high-voltage power lines, especially near nesting sites.

Syrian Woodpecker (Dendrocopos syriacus)

Threats to breeding habitat: The main threats to the species are related to degradation/loss of critical habitat. This degradation is mainly based on the intensification of forestry with the felling of mature forest stands degrading the species' nesting habitat by reducing the number of suitable trees available (Tucker and Heath 1994). Also, the gradual decline of traditional livestock farming in agroforestry areas is leading to the deforestation of grasslands and clearings, which are important foraging habitats for the species. At the same time, the abandonment and replacement of tree crops (e.g., almond, walnut, mulberry) with other types of crops, and the destruction of stream vegetation in rural landscapes e.g., willows, poplars, greatly reduce the heterogeneity of the topiary, which is required for the establishment of colonies (Tucker and Heath 1994).

Medium woodpecker (Leiopicus medius)

Threats to breeding habitat: The main threats to the species are related to 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 its range (Angelstam et al. 2004, Muller et al. 2009). At the spatial level of the landscape, forest fragmentation is a serious threat (Pasinelli 2000). Also, clear-cutting of deciduous forests and establishment with conifers in them leads to loss of habitat (Kosinski and Winiecki 2004).

Green woodpecker (Picus viridis)

Threats to breeding habitat: The main threats to the species are related to the degradation/loss of its critical habitat. Thus, the intensification of forestry with the felling of mature forest stands is degrading its nesting habitat, reducing the number of suitable trees available (Tucker and Heath 1994). Also, the gradual decline of traditional livestock farming in agroforestry areas is leading to the deforestation of grasslands and clearings, which are important feeding grounds for the species. At the same time, the abandonment and replacement of tree plantations (e.g. almond, walnut, mulberry) with other types of crops, the reforestation of conifers in deciduous forests, the destruction of stream riparian vegetation in rural landscapes e.g. e.g. willows, poplars, and afforestation projects, greatly reduce the landscape heterogeneity required for the establishment of headlands (Tucker and Heath 1994).

Ortolan Bunting (Emberiza hortulana)

Threats to breeding habitat: Habitat loss due to agricultural intensification and homogenization of rural landscapes is a major threat to the species (Fonderflick et al. 2005, Vepsäläinen et al. 2005). Alteration of natural vegetation, 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 areas, is the long-term abandonment of crops (mainly cereals) and the gradual decline of traditional livestock farming, processes that accelerate the gradual conversion of open areas into forests. Finally, residential development may be a factor in the decline of the species' populations at local scales (Tucker and Heath 1994).

Semicollared Flycatcher (Ficedula semitorquata)

Threats to breeding habitat: The main threats to the species are related to degradation/loss of critical habitat. This degradation is mainly based on the intensification of forestry, with the felling of mature forest stands and the extraction of dead standing trees, threatening the species at the spatial level of its territory. In addition, the construction of forest roads along the streams is altering 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, clear-cutting of deciduous forests and the establishment of conifer plantations in them leads to a loss of habitat.

Olive tree Warbler (Hippolais olivetorum)

Threats to breeding habitat: The main threats to the species are related to degradation/loss of critical habitat, particularly nesting habitat. Logging of sparse oak woodlands, extensive and recurrent fires, and the use of agrochemicals in extensive crops with a high proportion of Quickset hedge or tall trees (Tucker and Heath 1994) are threats to the species' habitat. The species is also closely associated with areas where grazing is practiced (sparse oak woodlands) which keeps the structure of breeding areas open. The reduction/abandonment of grazing in these areas may have negative effects on the species' populations.

Cretzschmar's Bunting (Emberiza caesia)

The main threats to the species (although most of them remain unclear due to the lack of knowledge of the ecology of the Greek population) are overgrazing, large-scale fires and intense residential development in the brushwood ecosystems. These threats alter or shrink the species' breeding habitats.

In more detail:

Threats to breeding habitat: The species' population trend in Greece appears to have been stable in recent years (Tucker and Heath 1994). The species prefers open areas with low vegetation (toadflax or sparse maquis), therefore practices that accelerate vegetation succession alter the species' habitat. Such a practice, to a small extent at the level of Greece, is the gradual abandonment of traditional livestock farming in coastal areas. Also, the role of extensive fires traditionally set by livestock farmers and farmers in the breeding areas of the species remains unclear. Small-scale fires are thought to make a positive contribution to the species' population by increasing the diversity of height and density of organic vegetation (patches of sparse and low vegetation alternating with patches of dense and tall vegetation). On the other hand, large-scale fires play a negative role, which, combined with overgrazing, lead to a gradual degradation of pastures (desertification process). Finally, the intensive residential development of coastal areas (fringing ecosystems) leads to a loss of habitat for the species.

Threats to foraging habitat: the loss of surface water sites during summer e.g., stream beds or waterholes and seasonal wetlands negatively affects the survival of the species. The problem is more pronounced on the Aegean islands as in many cases small seasonal island wetlands are threatened with total loss (Katsadorakis and Paragamian 2007).

Black eared Wheatear (Oenanthe hispanica)

Threats to breeding habitat: The main threats to the species are related to degradation/loss of critical habitat. Thus, the intensification of agriculture enhances monocultures, destroying the land mosaic. Also, land abandonment and undergrazing lead to afforestation of open areas, resulting in a reduction of suitable habitat for the species (Tucker and Heath 1994).

Western Rock Nuthatch (Sitta neumayer)

Threats to breeding habitat: The main threats to the species are associated with degradation/loss of critical habitat, primarily due to undergrazing or quarry operations.

Black headed Bunting (Emberiza melanocephala)

Threats to breeding habitat: Agricultural intensification is considered the main threat to the species as it alters its habitat. In particular, the destruction of natural vegetation, plant barriers and scattered trees in rural areas, reforestation projects that convert small-scale extensive crops into large-scale intensive crops of high homogeneity, intensive use of agrochemicals are measures that degrade the species' habitat (Handrinos and Akriotis 1997, Tucker and Heath 1994). Illegal capture and captivity also threaten the species on the Aegean islands (Tucker and Heath 1994).

Subalpine Warbler (Curruca cantillans)

Threats to breeding habitat: The main threats to the species are related to the degradation/loss of critical habitat, particularly nesting habitat. Repeated and extensive fires in shrublands or areas with long vegetation alter the vegetation structure to such an extent that it is difficult or impossible to colonize them. In addition, cutting or removal of shrubs in breeding areas gradually degrades the habitat of the species.

Sardinian Warbler (Curruca melanocephala)

Threats to breeding habitat: The main threats to the species are related to degradation/loss of critical habitat, particularly nesting habitat. Repeated and extensive fires in shrublands or areas with maquis vegetation alter the vegetation structure to such an extent that it is difficult or impossible to colonize them. In addition, cutting or removal of shrubs in breeding areas gradually degrades the habitat of the species.

Red backed Shrike (Lanius collurio)

The main threats are related to the degradation and destruction of the species' critical habitat. This degradation is mainly based on the intensification of agriculture.

In more detail:

Threats to breeding habitat: The main threats to the species are related to the degradation and loss of its critical habitat. Agricultural intensification is destroying the mosaic of land use, the plantation hedges. Also, extensive use of pesticides and fertilizers is reducing insect populations (Tucker and Heath 1994). Land abandonment intensifies deforestation of open areas that are essential for foraging for the species.

Tawny Owl (Strix aluco)

The destruction of forests and the decline of peri-urban forests and the removal of mature trees which deprives the species of important nesting sites are the main threats to the species.

Eastern Orphean Warbler (Curruca crassirostris)

Threats to breeding habitat: The main threats to the species are related to the degradation/loss of critical habitat, particularly nesting habitat. Logging of sparse oak woodlands, extensive and repeated fires, and the use of agrochemicals in extensive crops with a high proportion of hedgerows or tall trees (Tucker and Heath 1994) are threats to the species' habitat. The species is also closely associated with areas where grazing is practiced (sparse oak woodlands) which keeps the structure of breeding areas open. The reduction/abandonment of grazing in these areas may have negative effects on the species' populations.

Threats to migration habitat: The abandonment of fig cultivation and the gradual reduction of surface water sites in much of the island country (especially on small islands) is likely to lead to a reduction in food availability during autumn migration.

Eastern Bonelli's Warbler (Phylloscopus bonelli orientalis)

Threats to breeding habitat: The main threats to the species remain largely unclear due to the lack of information on its ecology. For example, the impact of logging on the species' populations or other forestry projects remains unclear. Thus, perhaps the most important threat is the lack of knowledge of its ecology (description of population size, optimal breeding habitat, requirements on the spatial scale of the territory).

Bonelli's Eagle (Aquila fasciata)

Residential development on many Aegean islands, abandonment of traditional land uses and over-exploitation of key food species of the species (mainly the island partridge and wild rabbits) combined with direct mortality are the main threats to the species.

In more detail:

Threats to breeding habitat: Disturbance near nesting sites and tourism development on the Aegean islands are key threats to the species' nesting habitat (Chandrinos 1992; Tucker and Heath 1994).

Threats to foraging habitat: Overhunting and poaching of key food species of the species and land use changes in its territories are the most important threats to the species' foraging habitat. (Chandrinos 1992; Lopez-Lopez et al. 2007).

Direct threats: The use of pesticides for the extermination of wild rabbits on some islands, poses a significant threat, as does human-induced mortality or the destruction of their burrows. In addition, the ongoing development of wind farms may have an impact on the species' populations.

Eastern Imperial Eagle (Aquila heliaca)

The destruction of mature trees and lowland stands of deciduous trees is the main threat to the species. In addition, the intensification of agriculture and direct killing due to persecution or secondary poisoning are major threats to the species.

In more detail:

Threats to breeding habitat: Destruction of mature trees and lowland forests attributed to agriculture is the main threat to the species' nesting habitat. Also, road building and increased disturbance in the species' territories are a major cause of breeding failure (Tucker and Heath 1994).

Threats to foraging habitat: Destruction of lowland forests, particularly of habitat between forest stands and crops. Also, the intensification of agriculture and the conversion of open lands to monoculture grain crops. Often the destruction of the grasslands of rabbit colonies due to the construction of dams in riparian areas or their return to agriculture has a direct impact on the productivity of the pairs.

Direct threats: Direct killing by humans is a major cause of the species' decline in the Balkans. Also, the use of poisoned baits to kill carnivorous mammals threatens both the breeding population and the wintering individuals in Greece (Hallmann 1989). Collision with power lines and electrocution are reported as serious mortalities but in Greece they are of minor importance due to the small population of the species (Hallmann 1996).

Western Marsh Harrier (Circus aeruginosus)

The destruction of riparian vegetation, especially reeds, and the filling of wet meadows.

Threats to breeding habitat: Burning and clearing of reeds is the main threat to nesting habitat.

Threats to foraging habitat: Destruction and shrinkage of wetlands especially wet meadows and shallow water areas where amphibians and reptiles abound.

Hen Harrier (Circus cyaneus)

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

Montagu's Harrier (Circus pygargus)

The intensification and industrialization of agriculture is the most serious threat to the species.

Threats to breeding habitat: The main threat to the species is the destruction of nests by agricultural (especially harvesting) machinery (Sanders and Maloney 2002).

Threats to foraging habitat: The species is threatened by agricultural intensification/industrialization and extensive use of agrochemicals (Sanders and Maloney 2002; Denker et al. 2003).

Pallid Harrier (Circus macrourus)

Threats to migration habitat: The species' habitat includes open lowland areas with low vegetation and is less dependent on water. It feeds on small mammals, small mammals, reptiles, and insects (Cramp and Simmons 1980; Ferguson-Lee and Christie 2001; Leckie et al. 2008; Arroyo et al. 2009).

Osprey (Pandion haliaetus)

Degradation or shrinkage of wetlands and coastal ecosystems as well as direct human persecution.

In more detail:

Threats to breeding habitat: Destruction of riparian forests and stands and disturbance of rocky shores where it nests (Tucker and Heath 1994; Saurola 1997; Newbrey et al. 2005). Also, uncontrolled use of pesticides and other agrochemicals that pass-through water into the food chain. (Wiemeyer et al. 1980, Hakkinen and Hasanen 1980, Toschik et al. 2006).

Threats to foraging habitat: Degradation and shrinkage of wetlands.

Direct threats: The species is often poached, and its nests are destroyed because it is considered a competitor to human fishing activities.

Merlin (Falco columbarius)

Threats to wintering habitat: Residential and tourism development of coastal areas, degradation of wetland ecosystems and agricultural intensification are the main threats to the species.

White tailed Eagle (Haliaeetus albicilla)

Threats to breeding habitat: The destruction of riparian forests with stands of mature trees deprives the species of valuable nesting habitat (Rosenvald and Lõhmus 2003). Also, the use of pesticides has negative effects on the species' reproductive success, although the exact effect of these is still unknown. Also, disturbance is a serious threat especially at nesting sites, to individual trees in isolated lowland stands (Jerrentrup 1988; Chandrinos 1992; Tucker and Heath 1994).

Threats to foraging habitat: Wetland destruction and degradation has been the major cause of population decline (Tucker and Heath 1994).

Direct threats: Leads from consumption of injured or dead prey species are some of the major causes of additional mortality of the species.

Levant Sparrowhawk (Accipiter brevipes)

Mature logging and destruction of riparian ecosystems, forest fires and intensification of agriculture negatively affect the species.

In detail:

Threats to breeding habitat: Forest destruction and the absence of suitable trees for foraging are the main threats to the species' breeding (Newton 1979).

Threats to foraging habitat: Agricultural intensification with extensive use of insecticides, destruction of riparian ecosystems due to urban or tourist development, and disturbance due to recreational activities degrade foraging habitat. Also, since the species feeds on reptiles, climate changes with extreme events resulting in a decrease in their activity negatively affect the reproductive success of the species (Shamoun-Baranes et al. 2006, Gensbol and Thiede 2008).

Peregrine Falcon (Falco peregrinus)

Direct killing due to competition with humans for prey species (rock doves, partridges, thrushes, etc.) and the use of strong agrochemicals with high residual capacity are the main threats to the species.

In more detail:

Threats to breeding habitat: Destruction of nesting habitat and disturbance (e.g., climbing tracks) are the main threats to nesting habitat (Brambilla et al. 2004).

Threats to foraging habitat: Agricultural intensification and extensive pesticide use are the main threat because pesticide preparations highly toxic to birds accumulate in the body of higher predators such as peregrine falcon (Ratcliffe 1993; Movalli 2000). At the same time, illegal predation on key food species (e.g., rock doves) degrades the hunting habitat of the species.

Threats of competition: Climate change favors the spread of the golden egret over the Lanner Falcon, as the former prefers drier, semi-arid areas compared to the peregrine falcon.

Direct threats: Direct killing by humans is the main cause of the species' absence from areas with suitable nesting habitat and relatively clean environments such as canyons, coastal cliffs, and river valleys.

Long legged Buzzard (Buteo rufinus)

Residential and tourism development and land-use changes in grassland and dry infertile land are the main threats to the species.

In more detail:

Threats to breeding habitat: Island tourism development and disturbance are the most serious threats to the species' breeding habitat.

Threats to feeding habitat: Destruction of forest clearings, intensification of agriculture and land-use change of bare open areas attributed to agriculture or residential development are major causes of degradation of the species' foraging habitat. Also, the conversion of grasslands to arable crops or of dry grasslands to irrigated monocultures have significant impacts on the species' hunting areas (Chandrinos 1992).

Black Kite (Milvus migrans)

Destruction of mature trees, landfilling of waste and dead animals, and the use of poisons are the main threats and causes of population decline of the species.

In more detail:

Threats to breeding habitat: Landfill closures and animal stalling are key threats to the species. In addition, the burial of dead animals and the general abandonment of nomadic farming are equally important threats (Blanco 1997, Meunier et al. 2000)

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

European Honey Buzzard (Pernis apivorus)

Destruction of mature trees, inland forest interspaces and extensive use of insecticides are the main threats to the species. Also, direct killing by humans during migration is a threat to the species.

In more detail:

Threats to breeding habitat: Destruction of forests and removal of mature trees degrade the species' nesting habitat. In addition, disturbance during the breeding season from logging practices and recreational activities pose an additional threat to the species' breeding success (Cramp and Perrins 1980; Steiner 2000).

Threats to foraging habitat: The main threats to the foraging habitat of the species are clear-cutting and destruction of key food items due to extensive use of insecticides.

Red footed Falcon (Falco vespertinus)

The destruction and degradation of the species' habitats (grasslands, wetlands, coasts) and the intensification of agriculture are threats to the species.

In more detail:

<u>Threats to migration habitat:</u> Agricultural intensification and extensive use of pesticides and insecticides are the main threats to the species (Tucker and Heath 1994).

<u>Direct threats:</u> Poaching is a threat to the species in several Mediterranean countries.

Lesser Kestrel (Falco naumanni)

Threats to the species include destruction of houses and intensification of agriculture.

In more detail:

<u>Threats to breeding habitat:</u> Urbanisation in synergy with the renovation of old buildings or the destruction of old houses is the most serious threat to the Lesser Kestrel (Handrinos and Akriotis 1997, Vlachos et al. 2004).

<u>Threats to foraging habitat:</u> Agricultural intensification and industrialization combined with extensive pesticide use threaten the species (Newton 1979; Village 1990; Tucker and Heath 1994). Also, abandonment of traditional agricultural and livestock practices and afforestation of grasslands result in the loss or degradation of the species' hunting habitat (Sánchez-Zapata et al. 2003). In particular, the conversion of dryland crops (mainly cereals) to irrigated monocultures has had devastating effects on the species (Tella and Forero 2000; Liven-Schulman et al. 2004).

Eleonora's Falcon (Falco eleonorae)

Tourist exploitation of breeding islands, disturbance due to visitor disturbance and predation by introduced species are the main threats to nesting habitat. In addition, the use of pesticides directly threatens the viability and reproduction of the species.

In more detail:

<u>Threats to breeding habitat:</u> Disturbance to breeding islands or the introduction of predators such as rats or cats are key threats to the species. Hunting (especially of wild rabbits) on Aegean islands is an additional disturbance factor, as is egg collection (Tucker and Heath 1994). Finally, uncontrolled tourism and overbuilding on many Aegean islands is a potentially severe problem.

Threats to foraging habitat: As the species feeds on insects and small birds it is prone to secondary poisoning due to accumulation of pesticides or other agrochemicals (Ristow et al. 1980). Already significant cases of poisoning were recorded at the beginning of the decade in Crete which were attributed to the use of a specific pesticide formulation (Ristow 2001). The species is also threatened using baits aimed at controlling small worms and mice that damage vineyards (Ristow and Xirouchakis 2000, Tsatsakis et al. 2001).

Competition threats: Visitation of breeding islands induces predation by rats (Ristow et al 1991) or other small carnivores (e.g., cats).

White stork (Ciconia ciconia)

Threats to feeding habitat: The species is threatened by habitat alteration particularly the drainage of wet meadows and floodplains. It is also threatened using agrochemicals on crops.

Direct threats: The species is often shot by poachers and is threatened by the placing of poisoned baits for "harmful" mammals and by bumping into power lines or telephone lines, particularly during the migration period.

The species **Boreal Owl funereus** is not mentioned in the above deliverable. The main characteristics of this species, as well as the pressures and threats to it, have been reported in Section 5, in the relevant subsection required.

A detailed description of the pressures and threats faced by the species of interest is given below, which, as we have seen in the previous sub-chapter, are derived according to their ecological requirements (see Table 23), according to the "Deliverable 2 Grouping of species according to their ecological requirements" of the identification of compatible activities in relation to the species characterization of the Special Protection Areas of avifauna (Dimalexis 2009), prepared by the Ministry of Environment and Natural Resources. Environmental Planning Department - Environmental Planning Division, Department of Natural Environment Management.

Big predators

Big predators are particularly vulnerable species and face many serious threats. It is characteristic that of the 22 species in this category, 15 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 'harmful' mammals (wolf, fox, skunk, etc.) and from poaching. These species are particularly sensitive to human disturbance. Finally, the incorrect siting of wind farms can cause serious problems due to impact and killing to many large predators.

Ardeidae– Ciconiiformes

Human activities associated with the degradation of forest ecosystems are the most important threats to endo-forest species. Thus, deforestation and inappropriate forest management are the main causes of degradation of the breeding and feeding habitats of endemic forest species.

Species of agroforestry ecosystems

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

Falconidae

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

Nocturnal

The main threats to nocturnal predators are the abandonment of traditional land uses, including extensive agriculture and livestock farming, the use of poison baits and inappropriate forest management. Agrochemical pollution, residential development, persecution, and human disturbance also threaten these species.

Their national and European importance for the conservation of biodiversity

The importance of species for the conservation of biodiversity at national and European level is commented on individually in the subsections describing each species of importance for the region.

The overall coherence of the NATURA 2000 network

The overall coherence of the Natura 2000 network of the wider study area is considered satisfactory. The project under study is located within the SPA GR1110010.

Conservation status of the habitat types and/or species for which the NATURA 2000 site concerned has been designated.

For the habitat type(s) listed in Annex I to Directive 92/43/EK

The specific project site is located outside of protected areas of the Natura 2000 network classified as SAC, SCI, and therefore there is no mapping of important habitat types.

For species listed in Annex II of Directive 92/43/EK:

As mentioned above, this site does not belong to the Natura 2000 network sites designated as SCAs, SCIs and there is no record of Directive 92/43/EK species in the Standard Data Forms of the network, however, indicative sampling was carried out for the other fauna species of the area (except for the avifauna that is the protected object of the SPAs and for which detailed records were made), and the presence of the species found is reflected in the relevant tables of this document with reference to their protection status.

As regards the species of avifauna listed in Annex I of Directive 2009/147 and migratory species with significant presence

The 46 species of interest (ornithofauna) selected, and all their information, listed in the respective SDFs of the studied SPAs GR1110010, GR1130011, GR1110002 and BG0002019, are shown in Table 24 below, which also shows in detail the conservation status, reflecting the degree of habitat protection important for each species and the likelihood of its recovery. With regard to the species Strix aluco, Curruca melanocephala, Curruca crassirostris, Curruca cantillans, Phylloscopus orientalis, Picus viridis, Sitta neumayer, Oenanthe hispanica and Emberiza melanocephala, which are within the selected 46 species of interest, are not listed in the SDFs of the SPAs under study, as they are qualifying species of the IBAs under study, however they are not Annex I species of the Birds Directive.

Table 24. *Section of the Standard Data Forms of the Natura 2000 network sites GR1110010, GR1130011, GR1110002 and BG0002019, showing the species of interest of the site recorded in them and the conservation status of their area.*

Natura code	G	Code	Scientific Name	S	NP	T	Size Min	Max	Unit	Cat.	D.qual.	A|B|C|D Pop.	A|B|C Con.	Iso.	Glo.
GR1110010	B	A079	*Aegypius monachus*			p	4	4	i		M	A	B	B	B
GR1130011	B	A079	*Aegypius monachus*			c				C	DD	B	B	A	A
GR1110002	B	A079	*Aegypius monachus*			r	21	35	p		G	A	B	A	A
BG0002019	B	A079	*Aegypius monachus*			p		46	i		G	C	A	B	B
GR1110010	B	A078	*Gyps fulvus*			c				P	DD	C	B	C	B
GR1110010	B	A078	*Gyps fulvus*			w				P	DD	C	B	C	B
GR1130011	B	A078	*Gyps fulvus*			p	13	13	I		G	C	B	C	B
GR1110002	B	A078	*Gyps fulvus*			c	115	115	i		G	A	B	B	B
GR1110002	B	A078	*Gyps fulvus*			p	0	3	p		G	C	B	B	B
BG0002019	B	A078	*Gyps fulvus*			p		35	i		G	C	A	C	C
GR1110010	B	A077	*Neophron percnopterus*			r	2	3	p		G	B	B	C	B
GR1130011	B	A077	*Neophron percnopterus*			r	1	1	p		G	B	B	C	B
GR1110002	B	A077	*Neophron percnopterus*			c				P	DD	A	B	B	A
GR1110002	B	A077	*Neophron percnopterus*			r	5	5	p		G	A	B	B	A
BG0002019	B	A077	*Neophron percnopterus*			r	1	2	p		G	B	A	C	A
GR1110002	B	A075	*Haliaeetus albicilla*			p	1	1	p		G	B	B	B	B
GR1110002	B	A075	*Haliaeetus albicilla*			w	4	16	i		G	B	B	B	B
BG0002019	B	A075	*Haliaeetus albicilla*			c				V	DD	C	B	C	C
GR1110010	B	A090	*Aquila clanga*			c				P	DD	C	B	B	B
GR1110002	B	A090	*Aquila clanga*			w	4	7	i		G	C	B		C
GR1110010	B	A089	*Aquila pomarina*			r	4	6	i		G	B	B	B	B
GR1130011	B	A089	*Aquila pomarina*			r	1	1	p		G	B	B	B	A
GR1110002	B	A089	*Aquila pomarina*			r	16	19	p		G	A	B	C	B
BG0002019	B	A089	*Aquila pomarina*			r	4	12	p		G	C	A	C	B
GR1110010	B	A404	*Aquila heliaca*			c				P	DD	B	B	B	B
GR1130011	B	A404	*Aquila heliaca*			c				R	DD	A	B	B	A
GR1110002	B	A404	*Aquila heliaca*			w	4	4	i		G	A	C	B	B
BG0002019	B	A404	*Aquila heliaca*			p	1	2	p		G	A	A	C	A
GR1110010	B	A091	*Aquila chrysaetos*			p	4	5	i		G	B	B	C	B
GR1130011	B	A091	*Aquila chrysaetos*			p	1	1	p		G	C	B	C	B
GR1110002	B	A091	*Aquila chrysaetos*			p	4	4	p		G	B	B	B	B

Natura code	G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
							Min	Max				Pop.	Con.	Iso.	Glo.
BG0002019	B	A091	*Aquila chrysaetos*			p	2	3	p		G	C	A	C	C
GR1110010	B	A092	*Hieraaetus pennatus*			r	3	6	p		G	B	B	C	B
GR1130011	B	A092	*Hieraaetus pennatus*			r				P	DD	C		C	A
GR1110002	B	A092	*Hieraaetus pennatus*			r	20	23	p		G	A	B	C	B
BG0002019	B	A092	*Hieraaetus pennatus*			r	2	8	p		G	B	A	C	A
GR1110010	B	A080	*Circaetus gallicus*			r	8	10	i		G	B	A	C	B
GR1130011	B	A080	*Circaetus gallicus*			r				C	DD	B	A	C	B
GR1110002	B	A080	*Circaetus gallicus*			r	37	40	p		G	B	B	C	B
BG0002019	B	A080	*Circaetus gallicus*			r	9	11	p		G	C	A	C	B
GR1110010	B	A403	*Buteo rufinus*			c				P	DD	C	B	B	B
GR1130011	B	A403	*Buteo rufinus*			p				P	DD	C	B	B	B
GR1110002	B	A403	*Buteo rufinus*			r	1	2	p		G	C	B	B	B
BG0002019	B	A403	*Buteo rufinus*			p	4	5	p		G	C	A	C	C
GR1110010	B	A072	*Pernis apivorus*			r	8	10	i		G	C	A	C	B
GR1130011	B	A072	*Pernis apivorus*			r				P	DD	C		C	B
GR1110002	B	A072	*Pernis apivorus*			r	15	16	p		G	C	B	C	B
BG0002019	B	A072	*Pernis apivorus*			r	8	25	p		G	C	A	C	A
GR1110010	B	A074	*Milvus milvus*			c				P	DD	B	A	B	B
GR1110002	B	A074	*Milvus milvus*			c				P	DD	C	B		B
GR1110010	B	A030	*Ciconia nigra*			r	4	6	i		G	B	B	B	B
GR1130011	B	A030	*Ciconia nigra*			r				P	DD	B	B	B	B
GR1110002	B	A030	*Ciconia nigra*			r	31	35	p		G	A	A	B	A
BG0002019	B	A030	*Ciconia nigra*			r	6	18	p		G	B	A	C	A
GR1110010	B	A215	*Bubo bubo*			p	2		p		M	C	A	C	B
GR1130011	B	A215	*Bubo bubo*			p	1	1	p		G	C	A	C	B
GR1110002	B	A215	*Bubo bubo*			p	4	4	p		G	C	B	C	B
BG0002019	B	A215	*Bubo bubo*			p	2	2	p		G	C	A	C	C
GR1110010	B	A429	*Dendrocopos syriacus*			p	11	11	i/sq.km		M	C	A	B	B

Natura code	G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
							Min	Max				Pop.	Con.	Iso.	Glo.
GR1130011	B	A429	*Dendrocopos syriacus*			p				C	DD	C	A	C	B
GR1110002	B	A429	*Dendrocopos syriacus*			p	1	11	i/sq.km		M	C	B	C	B
BG0002019	B	A429	*Dendrocopos syriacus*			p	200	350	p		G	C	A	C	C
GR1110010	B	A238	*Dendrocopos medius*			p				P	DD	C	B	C	B
GR1130011	B	A238	*Dendrocopos medius*			p				C	DD	C	B	C	B
GR1110002	B	A238	*Dendrocopos medius*			p				P	M	C	B	C	B
BG0002019	B	A238	*Dendrocopos medius*			p	100	150	p		G	C	A	C	B
GR1110010	B	A379	*Emberiza hortulana*			r				P	DD	C	A	C	B
GR1130011	B	A379	*Emberiza hortulana*			r				C	DD	C	A	B	B
GR1110002	B	A379	*Emberiza hortulana*			r	1	17	i/sq.km		M	C	B	C	B
BG0002019	B	A379	*Emberiza hortulana*			r	67	194	p		G	C		C	C
GR1110010	B	A338	*Lanius collurio*			c	53	53	i/sq.km		M	C	B	C	B
GR1110010	B	A338	*Lanius collurio*			r				C	DD	C	B	C	B
GR1130011	B	A338	*Lanius collurio*			r	8	8	i/sq.km		M	C	B	C	B
GR1110002	B	A338	*Lanius collurio*			r	2	28	i/sq.km		M	C	B	C	B
BG0002019	B	A338	*Lanius collurio*			r	4500	5500	p		G	C	A	C	B
GR1110010	B	A442	*Ficedula semitorquata*			r				P	DD	C	B	C	B
GR1130011	B	A442	*Ficedula semitorquata*			r				R	DD	B		B	A
GR1110002	B	A442	*Ficedula semitorquata*			r				P	DD	C	B	B	B
BG0002019	B	A442	*Ficedula semitorquata*			r	2	25	p		G	C	B	C	C
GR1110010	B	A439	*Hippolais olivetorum*			r				P	DD	C	B	C	B
GR1130011	B	A439	*Hippolais olivetorum*			r				P	DD	C		C	B
GR1110002	B	A439	*Hippolais olivetorum*			r				P	DD	C	B	C	B
BG0002019	B	A439	*Hippolais olivetorum*			r	30	40	p		G	C	A	C	A
GR1110010	B	A447	*Emberiza caesia*			r				P	DD	C	C	C	B
GR1110002	B	A447	*Emberiza caesia*			r				P	DD	C	B	B	B
GR1110010	B	A073	*Milvus migrans*			c				P	DD	C	B	C	B
GR1110002	B	A073	*Milvus migrans*			r	0	1	p		G	C	B	B	B

Natura code	G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
							Min	Max				Pop.	Con.	Iso.	Glo.
GR1110002	B	A073	*Milvus migrans*			w	28	53	i		M		B	B	B
BG0002019	B	A073	*Milvus migrans*			r	2	2	p		G	C	A	C	B
GR1110010	B	A094	*Pandion haliaetus*			c				P	DD	C	C	C	B
GR1110002	B	A094	*Pandion haliaetus*			c				P	DD	C	B		B
GR1110010	B	A709	*Falco peregrinus*			p				P	DD	C	B	C	B
GR1130011	B	A709	*Falco peregrinus*			p				R	DD	C	A	C	B
GR1110002	B	A709	*Falco peregrinus*			p	3	4	p		G	C	B	C	B
BG0002019	B	A103	*Falco peregrinus*			r	2	2	p		G	C	A	C	C
GR1110010	B	A081	*Circus aeruginosus*			c				P	DD	C	B	C	B
GR1130011	B	A081	*Circus aeruginosus*			c				P	DD	C	B	C	B
GR1110002	B	A081	*Circus aeruginosus*			p	2	3	p		G	B	B	C	B
GR1110002	B	A081	*Circus aeruginosus*			c				P	DD	B	B		B
GR1110010	B	A082	*Circus cyaneus*			c				P	DD	C	A	C	B
GR1130011	B	A082	*Circus cyaneus*			c				P	DD	C	A	B	B
GR1110002	B	A082	*Circus cyaneus*			w	30		i		M	B	B	C	B
GR1110010	B	A083	*Circus macrourus*			c				P	DD	C	B	B	B
GR1130011	B	A083	*Circus macrourus*			c				R	DD	C	B	C	B
GR1110002	B	A083	*Circus macrourus*			c				P	DD	C	B		B
GR1110010	B	A084	*Circus pygargus*			c				P	DD	C	B	C	B
GR1130011	B	A084	*Circus pygargus*			c				P	DD	C	B	C	B
GR1110002	B	A084	*Circus pygargus*			c				P	DD	C	B		B
BG0002019	B	A084	*Circus pygargus*			r	1	1	p		G	C	A	C	C
GR1110010	B	A707	*Aquila fasciata*			c				P	DD	C	B	B	B
GR1110002	B	A707	*Aquila fasciata*												
BG0002019	B	A093	*Aquila fasciata*			c	1	1	i		G	A	B	B	A
BG0002019	B	A093	*Aquila fasciata*			r		3	i		G	A	B	B	A
GR1110010	B	A402	*Accipiter brevipes*			r				P	DD	C	A	B	B
GR1130011	B	A402	*Accipiter brevipes*			r	2		p		M	C	A	B	B

Natura code	G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
							Min	Max				Pop.	Con.	Iso.	Glo.
GR1110002	B	A402	*Accipiter brevipes*			r	3	4	p		G	C	B	C	B
BG0002019	B	A402	*Accipiter brevipes*			r	2	2	p		G	C	B	C	C
GR1110010	B	A095	*Falco naumanni*			c				P	DD	C	B	C	B
GR1130011	B	A095	*Falco naumanni*			c				P	DD	C		C	B
GR1110002	B	A095	*Falco naumanni*												
BG0002019	B	A095	*Falco naumanni*			r		1	p		G	A	A	B	B
GR1110010	B	A100	*Falco eleonorae*			c				P	DD	C	B	B	B
GR1130011	B	A100	*Falco eleonorae*			c				P	DD	C	B	C	B
GR1110002	B	A100	*Falco eleonorae*			c				P	DD	C	B		B
GR1110010	B	A097	*Falco vespertinus*			c				P	DD	C	B	C	B
GR1110002	B	A097	*Falco vespertinus*			c				P	DD	C	B		B
BG0002019	B	A097	*Falco vespertinus*			c				P	DD	C	B	C	C
GR1110010	B	A098	*Falco columbarius*			c				P	DD	C	B	C	B
GR1110002	B	A098	*Falco columbarius*			c				P	DD	C	B	C	B
GR1110010	B	A667	*Ciconia ciconia*			c				P	DD	C	B	C	B
GR1130011	B	A667	*Ciconia ciconia*			c				P	DD	C		C	B
GR1110002	B	A667	*Ciconia ciconia*			r	25	25	p		M	C	B	C	B
BG0002019	B	A031	*Ciconia ciconia*			r	5	5	p		G	C	A	C	C
GR1110010	B	A223	*Aegolius funereus*			p				P	DD	B	A	B	B

As regards the species of avifauna listed in Annex I of Directive 2009/147 and migratory species with significant presence.

The 46 species of interest (avifauna) selected, as well as all their information, listed in the respective SDF form of the studied SPAs GR1110010, GR1130011, GR1110002 and BG0002019, are shown in Table 24 below, which also shows in detail the conservation status, reflecting the degree of habitat protection important for each species and the likelihood of its recovery. Regarding the species Strix aluco, Curruca melanocephala, Curruca crassirostris, Curruca cantillans, Phylloscopus orientalis, Picus viridis, Sitta neumayer, Oenanthe hispanica and Emberiza melanocephala, which are within the selected 46 species of interest, are not listed in the SDF of the study SPAs, as they are species of designation in the study IBA, however they are not Annex I species of the Birds Directive.

The analysis of the above table shows that:

Regarding the SPA GR1110010

The **Cinereous Vulture** (Aegypius monachus) is a resident species in the study area and has at least four individuals in the area. The data provided are of moderate quality and are based on both field data and partial modelling of the species' distribution. Conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means excellent conservation. The population of the species is classified as not isolated but within the limits of its range, and the overall conservation value of the site is good.

The **Golden Eagle** (Aquila chrysaetos) is a resident species in the study area and has at least four individuals in the area. The data provided is of excellent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site, as it relates to the conservation of the species, is good.

The **Greater Spotted Eagle** (Clanga clanga) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2 % of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is classified as B, which means good conservation. The population of the species is classified as not isolated but within the limits of its range, and the overall conservation value of the site is good.

The **Eastern Imperial Eagle** (Aquila heliaca) is a species that occurs in concentrations in the study area with the population in the study area representing 2 - 15% of the national population (population criterion B). The data provided is classified as insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is given a conservation criterion of B, meaning good conservation. The population of the species is classified as not isolated but within the limits of its range, and the overall conservation value of the site is good.

The **Lesser Spotted Eagle** (Clanga pomarina) is a species that breeds in the study area and has at least four individuals in the area. The data provided is of decent quality and are based on field data. The conservation status, which reflects the degree of habitat protection important to the species and the likelihood of its recovery, is rated B, which means good conservation. The population of the species is classified as not isolated but within the limits of its range, and the overall conservation value of the site is good.

The **Eagle Owl** (Bubo bubo) is a resident species in the study area and has at least two pairs in the area. The data provided are of moderate quality and are based on both field data and partial modelling of the distribution of the species. Conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Long-legged Buzzard** (Buteo rufinus) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2 % of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is classified as B, which means good conservation. The population of the species is classified as not isolated but within the limits of its range, and the overall conservation value of the site is good.

The **Black Stork** (Ciconia nigra) is a species that breeds in the study area and has at least four individuals in the area. The data provided is of decent quality and are based on field data. The conservation status, which reflects the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as not isolated but is located within the range boundary, and the overall conservation value of the site is good.

The Snake Eagle (Circaetus gallicus) is a species that breeds in the study area and has at least eight individuals in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Marsh Harrier** (Circus aeruginosus) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2 % of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is classified as B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Hen Harrier** (Circus cyaneus) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2 % of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is given a conservation criterion of A, meaning excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Pallid Harrier** (Circus macrourus) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2 % of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is classified as B, which means good conservation. The population of the species is classified as not isolated but within the limits of its range, and the overall conservation value of the site is good.

The **Montagu's Harrier** (Circus pygargus) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2 % of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is classified as B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Medium Woodpecker** (Leiopicus medius) is a resident species in the study area with its population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of its recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Syrian woodpecker** (Dendrocopos syriacus) is a resident species in the study area and numbers at least 11 individuals per square kilometer in the area. The data provided are of moderate quality and are based on both field data and partial modelling of the distribution of the species. Conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as not isolated but within the limits of its range, and the overall conservation value of the site is good.

Cretzschmar's Bunting (Emberiza caesia) is a breeding species in the study area, with the population in the study area representing 0-2% of the national population (population criterion C). The data provided is considered insufficient. Conservation status, reflecting the degree of habitat protection important to the species and the likelihood of its recovery, is assigned a conservation criterion of C, which means moderate or degraded conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

Ortolan Bunting (Emberiza hortulana) is a species that breeds in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is given a conservation criterion of A, meaning excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Peregrine Falcon** (Falco peregrinus) is a resident species in the study area with its population in the study area representing 0-2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of its recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Semicollared Flycatcher** (Ficedula semitorquata) is a species that breeds in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Griffon vulture** (Gyps fulvus) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good. The species also winters in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). In this category of the species' relationship with Natura (overwintering), the data provided are considered insufficient. The conservation status, which reflects the degree of protection of the habitat important for the species and the likelihood of its recovery, is classified as B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Booted Eagle** (Hieraaetus pennatus) is a species that breeds in the study area and has at least three pairs in the area. The data provided is of decent quality and are based on field data. The conservation status, which reflects the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site, as it relates to the conservation of the species, is good.

The olive tree Warbler (Hippolais olivetorum) is a species that breeds in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Red Backed Shrike** (Lanius collurio) is a species that breeds in the study area, with its population in the study area representing 0-2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good. The species is also observed in concentrations in the study area and has at least 53 individuals per square kilometer in the area. In this category of the species' relationship with Natura (in concentrations), the data provided are of moderate quality and are based on both field data and partial modelling of the species' distribution. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is assigned a B criterion, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Black Kite** (Milvus migrans) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Red Kite** (Milvus milvus) is a species that occurs in concentrations in the study area with the population in the study area representing 2 - 15% of the national population (population criterion B). The data provided is classified as insufficient. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is given a conservation criterion of A, which means excellent conservation. The population of the species is classified as not isolated but within the limits of its range, and the overall conservation value of the site is good.

Egyptian Vulture (Neophron percnopterus) is a species that breeds in the study area and has at least two pairs in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site, as it relates to the conservation of the species, is good.

The **osprey** (Pandion haliaetus) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. Conservation status, reflecting the degree of habitat protection important to the species and the likelihood of its recovery, is assigned a conservation criterion of C, meaning moderate or degraded conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **European Honey Buzzard** (Pernis apivorus) is a species that breeds in the study area and has at least eight individuals in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Bonelli's Eagle** (Aquila fasciata) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2 % of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is classified as B, which means good conservation. The population of the species is classified as not isolated but within the limits of its range, and the overall conservation value of the site is good.

The **Levant Sparrowhawk** (Accipiter brevipes) is a breeding species in the study area, with its population in the study area accounting for 0-2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is given a conservation criterion of A, meaning excellent conservation. The population of the species is classified as not isolated, but within the limits of its range, and the overall conservation value of the site is good.

The **Lesser Kestrel** (Falco naumanni) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Eleonora's Falcon** (Falco eleonorae) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as not isolated, but within the limits of its range, and the overall conservation value of the site is good.

The **Red footed Falcon** (Falco vespertinus) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Merlin** (Falco columbarius) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. Conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **White Stork** (Ciconia ciconia) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. Conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

Boreal Owl (Aegolius funereus) is a resident species in the study area with its population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of its recovery, is given a conservation criterion of A, meaning good excellent conservation. The population of the species is classified as not isolated, but within the limits of its range, and the overall conservation value of the site is good.

As regards the SPA GR1130011

The **Cinereous Vulture** (Aegypius monachus) is a species observed in concentrations in the study area with its population in the study area representing 2 - 15% of the national population (population criterion B). The data provided is considered insufficient. Conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is classified as B, which means good conservation. The population of the species is classified as almost isolated, while the overall conservation value of the site is excellent.

The **Golden Eagle** (Aquila chrysaetos) is a resident species in the study area and has at least one pair in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site, as it relates to the conservation of the species, is good.

The **Snake Eagle** (Circaetus gallicus) is a species that breeds in the study area, with the population in the study area accounting for 2 - 15% of the national population (population criterion B). The data provided is classified as insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is given a conservation criterion of A, meaning excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Middle-Spotted Woodpecker** (Leiopicus medius) is a resident species in the study area with its population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of its recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Syrian Woodpecker** (Dendrocopos syriacus) is a resident species in the study area with its population in the study area representing 0-2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of its recovery, is given a conservation criterion of A, meaning excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

Ortolan Bunting (Emberiza hortulana) is a species that breeds in the study area with its population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is given a conservation criterion of A, meaning excellent conservation. The population of the species is classified as not isolated but within the limits of its range, and the overall conservation value of the site is good.

The **Semicollared Flycatcher** (Ficedula semitorquata) is a species that breeds in the study area with the population in the study area accounting for 2 - 15% of the national population (population criterion B). The data provided is classified as insufficient. No assessment was made of the conservation status, which reflects the degree of habitat protection important to the species and the likelihood of its recovery. The population of the species is classified as not isolated but is located within the limits of its range, and the overall conservation value of the site is excellent.

The **Griffon Vulture** (Gyps fulvus) is a resident species in the study area and has at least 13 individuals in the area. The data provided are of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Red backed Shrike** (Lanius collurio) is a breeding species in the study area, with at least 8 pairs per square kilometer in the area. The data provided are of moderate quality and are based on both field data and partial modelling of the distribution of the species. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Egyptian vulture** (Neophron percnopterus) is a breeding species in the study area and numbers up to one pair in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site, as it relates to the conservation of the species, is good.

The **Lesser Spotted Eagle** (Clanga pomarina) is a species that breeds in the study area and numbers up to one pair in the area. The data provided is of decent quality and are based on field data.

The conservation status, which reflects the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as not isolated but is located within its range, and the overall conservation value of the site is excellent.

The **Eastern Imperial Eagle** (Aquila heliaca) is a species that occurs in concentrations in the study area with the population in the study area representing more than 15% of the national population (population criterion A). The data provided is classified as insufficient. Conservation status, reflecting the degree of habitat protection important to the species and the likelihood of its recovery, is given a conservation criterion of B, meaning good conservation. The population of the species is classified as non-isolated but within the limits of its range, and the overall conservation value of the site is excellent.

The **Booted Eagle** (Hieraaetus pennatus) is a species that breeds in the study area with its population in the study area corresponding to 0-2% of the national population (population criterion C). The data provided is considered insufficient. No assessment was made of the conservation status, which reflects the degree of habitat protection important to the species and the likelihood of its recovery. The population of the species is described as non-isolated with a wide distribution, and the overall conservation value of the site is excellent.

The **Long-legged Buzzard** (Buteo rufinus) is a resident species in the study area with the population in the study area representing 0 - 2 % of the national population (population criterion C). The data provided is considered insufficient. The conservation status, which reflects the degree of protection of the habitat important to the species and the likelihood of its recovery, is given a B, which means good conservation. The population of the species is classified as not isolated but within the limits of its range, and the overall conservation value of the site is good.

The **European Honey Buzzard** (Pernis apivorus) is a breeding species in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. No assessment was made of the conservation status, which reflects the degree of habitat protection important to the species and the likelihood of its recovery. The population of the species is described as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **black stork** (Ciconia nigra) is a breeding species in the study area with the population in the study area representing 2 - 15% of the national population (population criterion B). The data provided is described as insufficient. The conservation status, which reflects the degree of habitat protection important to the species and the likelihood of its recovery, is classified as good conservation, with a criterion B. The population of the species is classified as not isolated but within the limits of its range, and the overall conservation value of the site is good.

Eagle owl (Bubo bubo) is a resident species in the study area and there is up to one pair in the area. The data provided is of decent quality and based on field data. Conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The olive tree Warbler (Hippolais olivetorum) is a species that breeds in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. No assessment was made of the conservation status, which reflects the degree of habitat protection important to the species and the likelihood of its recovery. The population of the species is described as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **peregrine falcon** (Falco peregrinus) is a resident species in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of its recovery, is given a conservation criterion of A, meaning excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Western Marsh Harrier** (Circus aeruginosus) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2 % of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is classified as B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Hen Harrier** (Circus cyaneus) is a species that occurs in concentrations in the study area, with the population in the study area representing 0-2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is given a conservation criterion of A, meaning excellent conservation. The population of the species is classified as not isolated but within the limits of its range, and the overall conservation value of the site is good.

Pallid Harrier (Circus macrourus) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2 % of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is classified as B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Montagu's Harrier** (Circus pygargus) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2 % of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is classified as B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Levant Sparrowhawk** (Accipiter brevipes) is a species that breeds in the area and numbers up to two pairs in the study area. The data given are of moderate quality and are based on both field data and partial data from the modelling of the distribution of the species. The conservation status, which reflects the degree of habitat protection that is important for the species and the the likelihood of its recovery, is characterised by criterion A, which means excellent conservation. The population of the species is classified as not isolated but within the limits of its range, while the overall value of the site in terms of the conservation value of the species is good.

The **Lesser Kestrel** (Falco naumanni) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. No assessment was made of the conservation status, reflecting the degree of habitat protection important to the species and the likelihood of its recovery. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Eleonora's Falcon** (Falco eleonorae) is a species that is observed in concentrations in the study area with its population in the study area corresponding to 0-2% of the national population (population criterion C). The data provided is considered insufficient. Conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **white stork** (Ciconia ciconia) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. No assessment was made of the conservation status, reflecting the degree of habitat protection important to the species and the likelihood of its recovery. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

For SPA GR1110002

Black vulture (Aegypius monachus) is a breeding species in the study area and there are at least 21 pairs in the area. The data given are of decent quality and are based on field data. The conservation status reflecting the degree of habitat protection important to the species and the likelihood of recovery is rated B, which means good conservation. The population of the species is classified as nearly isolated, and the overall conservation value of the site is excellent.

The Golden Eagle (Aquila chrysaetos) is a resident species in the study area and has up to four pairs in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as not isolated but is located within the range boundary, and the overall conservation value of the site is good.

The Spotted Eagle (Clanga clanga) is a species that winters in the study area and has at least four individuals in the area. The data provided are of decent quality and based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. No data is provided regarding the isolation of the species' population, and the overall conservation value of the site is adequate.

The Eastern Imperial Eagle (Aquila heliaca) is a species that winters in the study area and has up to four individuals in the area. The data provided is of decent quality and based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated C, meaning moderate or degraded conservation. The population of the species is classified as not isolated, but is located within the limits of its range, and the overall conservation value of the site is good.

The Eagle Owl (Bubo bubo) is a resident species in the study area and there are up to four pairs in the area. The data provided is of decent quality and based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site, which relates to the conservation of the species, is good.

The **Long-legged Buzzard** (Buteo rufinus) is a breeding species in the study area and has at least one pair in the area. The data given are of decent quality and based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as not isolated but within the range boundary, and the overall conservation value of the site, which is relevant to the conservation of the species, is good.

The **Black Stork** (Ciconia nigra) is a breeding species in the study area and there are at least 31 pairs in the area. The data provided is of decent quality and based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as not isolated but within the range boundary, and the overall conservation value of the site, which is relevant to the conservation of the species, is excellent.

The **Snake Eagle** (Circaetus gallicus) is a breeding species in the study area and there are at least 37 pairs in the area. The data provided is of decent quality and based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site, which relates to the conservation of the species, is good.

Cretzschmar's Bunting (Emberiza caesia) is a breeding species in the study area with the population in the study area representing 0-2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is classified as B, which means good conservation. The population of the species is classified as not isolated but within the limits of its range, and the overall conservation value of the site is good.

The **Griffon Vulture** (Gyps fulvus) is a resident species in the study area and has up to three pairs in the area. The data provided is of decent quality and based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as not isolated but within the range boundary, and the overall conservation value of the site, which is relevant to the conservation of the species, is good. The species is also observed in concentrations in the study area and has at least 115 individuals in the area. In this category of the species' relationship with Natura (in concentrations) the data given are of decent quality and based on field data. The conservation status, reflecting the degree of protection of the habitat important for the species and the likelihood of its recovery, is classified as B, which means good conservation. The population of the species is classified as not isolated but within the range boundary, and the overall conservation value of the site, which is relevant to the conservation of the species, is good.

The **White-tailed Eagle** (Haliaeetus albicilla) is a resident species in the study area and numbers up to one pair in the area. The data provided is of decent quality and based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as not isolated but within the range boundary, and the overall conservation value of the site, which is relevant to the conservation of the species, is good. The species also winters in the study area and has at least four individuals in the area. In this category of the species' relationship with Natura (overwintering) the data provided are of decent quality and based on field data. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is classified as B, which means good conservation. The population of the species is classified as not isolated but within the range boundary, and the overall conservation value of the site, which is relevant to the conservation of the species, is good.

The **Booted Eagle** (Hieraaetus pennatus) is a breeding species in the study area and there are at least 20 pairs in the area. The data provided is of decent quality and based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site, which relates to the conservation of the species, is good.

The Olive tree Warbler (Hippolais olivetorum) is a species that breeds in the study area with the population in the study area representing 0-2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is classified as B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Egyptian vulture** (Neophron percnopterus) is a breeding species in the study area and has up to five pairs in the area. The data provided is of decent quality and based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as not isolated but is located within the range boundary, and the overall conservation value of the site, which is relevant to the conservation of the species, is excellent. The species is also observed in concentrations in the study area. In this category of the species' relationship with Natura (in concentrations) the data provided are considered insufficient. The conservation status, which reflects the degree of protection of the habitat important for the species and the likelihood of its recovery, is classified as B, which means good conservation. The population of the species is classified as non-isolated but within the limits of its range, and the overall conservation value of the site is excellent.

The **European Honey Buzzard** (Pernis apivorus) is a species that breeds in the study area and has at least 15 pairs in the area. The data provided is of decent quality and based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Red Kite** (Milvus milvus) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is given a conservation criterion of B, meaning good conservation. No data are provided on the isolation of the species' population, while the overall conservation value of the site is good.

The **Syrian woodpecker** (Dendrocopos syriacus) is a resident species in the study area and numbers at least one individual every one square kilometer. The data provided are of moderate quality and are based on both field data and partial modelling of the distribution of the species. Conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Middle-Spotted Woodpecker** (Leiopicus medius) is a resident species in the study area with its population in the study area representing 0 - 2% of the national population (population criterion C). The data provided are of moderate quality and are based on both field data and partial modelling of the species' distribution. Conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is assigned a B criterion of good conservation.

The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

Ortolan Bunting (Emberiza hortulana) is a species that breeds in the study area and numbers at least one individual every square kilometer. The data provided are of moderate quality and are based on both field data and partial modelling of the species' distribution. Conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Red backed Shrike** (Lanius collurio) is a species that breeds in the study area and numbers at least two individuals every one square kilometer. The data provided are of moderate quality and are based on both field data and partial modelling of the distribution of the species. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Semi collared Flycatcher** (Ficedula semitorquata) is a species that breeds in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is classified as B, which means good conservation. The population of the species is classified as not isolated but within the limits of its range, and the overall conservation value of the site is good.

The **Black Kite** (Milvus migrans) is a breeding species in the study area and numbers up to one pair in the area. The data provided is of decent quality and based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as not isolated but within the range boundary, and the overall conservation value of the site, which is relevant to the conservation of the species, is good. The species is also observed wintering in the study area. In this category of the species' relationship with Natura (overwintering), the data provided are of moderate quality and are based on both field data and partial modelling of the species' distribution. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is assigned a B criterion, which means good conservation. The population of the species is classified as not isolated but within the limits of its range, and the overall conservation value of the site is good.

The **Osprey** (Pandion haliaetus) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is given a conservation criterion of B, meaning good conservation. No data are provided on the isolation of the species' population, while the overall conservation value of the site is good.

The **Western Marsh Harrier** (Circus aeruginosus) is a resident species in the study area and has at least two pairs in the area. The data provided is of decent quality and based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good. The species is also observed in concentrations in the study area. In this category of the species' relationship with Natura (in concentrations) the data given are considered insufficient. The conservation status, which reflects the degree of protection of the habitat important for the species and the likelihood of its recovery, is classified as B, which means good conservation. No data are provided on the isolation of the species' population, while the overall conservation value of the site is good.

The **Hen Harrier** (Circus cyaneus) is a wintering species in the study area and numbers up to 30 individuals in the area. The data provided are of moderate quality and are based on both field data and partial modelling of the species' distribution. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

Pallid Harrier (Circus macrourus) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is classified as B, which means good conservation. No data are provided on the isolation of the species' population, while the overall conservation value of the site is good.

The **Montagu's Harrier** (Circus pygargus) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is classified as B, which means good conservation. No data are provided on the isolation of the species' population, while the overall conservation value of the site is good.

The **Peregrine Falcon** (Falco peregrinus) is a resident species in the study area and has at least three pairs in the area. The data provided is of decent quality and based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site, which relates to the conservation of the species, is good.

The **Bonelli's Eagle** (Aquila fasciata) is simply listed in the SDF for the area in question, without an assessment of any of the above parameters (e.g., conservation status, population isolation, population data in the area, etc.).

The **Levant Sparrowhawk** (Accipiter brevipes) is a breeding species in the study area and has at least three pairs in the area. The data given are of decent quality and based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site, which relates to the conservation of the species, is good.

The **Lesser Kestrel** (Falco naumanni) is simply listed in the SDF for the area in question, without an assessment of any of the above parameters (e.g., conservation status, population isolation, population data in the area, etc.).

The **Eleonora's Falcon** (Falco eleonorae) is a species that occurs in concentrations in the study area with its population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is classified as B, which means good conservation. No data are provided on the isolation of the species' population, while the overall conservation value of the site is good.

The **Red footed Falcon** (Falco vespertinus) is a species observed in concentrations in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, which reflects the degree of protection of the habitat important for the species and the likelihood of its recovery, is classified as B, which means good conservation. No data are provided on the isolation of the species' population, while the overall conservation value of the site is good.

The **Merlin** (Falco columbarius) is a species observed in concentrations in the study area with its population in the study area representing 0-2% of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is classified as B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **white stork** (Ciconia ciconia) is a breeding species in the study area and has up to 25 pairs in the area. The data provided are of moderate quality and are based on both field data and partial modelling of the distribution of the species. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

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Cinereous Vulture (Aegypius monachus) is a resident species in the study area and numbers up to 46 individuals in the area. The data provided is of decent quality and are based on field data. Conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as not isolated, but is located within the range boundary, and the overall conservation value of the site is good.

The **Golden Eagle** (Aquila chrysaetos) is a resident species in the study area and has at least two pairs in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is adequate.

The **Snake Eagle** (Circaetus gallicus) is a breeding species in the study area and there are at least nine pairs in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Middle-Spotted Woodpecker** (Leiopicus medius) is a resident species in the study area and has at least 100 pairs in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Syrian Woodpecker** (Dendrocopos syriacus) is a resident species in the study area and has at least 200 pairs in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is adequate.

Ortolan Bunting (Emberiza hortulana) is a species that breeds in the study area and has at least 67 pairs in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, was not assessed. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is adequate.

The **Semicollared Flycatcher** (Ficedula semitorquata) is a species that breeds in the study area and has at least two pairs in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is adequate.

The **Vulture** (Gyps fulvus) is a resident species in the study area and has up to 35 individuals in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is adequate.

The **Red backed Shrike** (Lanius collurio) is a breeding species in the study area and there are at least 4,500 pairs in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Egyptian vulture** (Neophron percnopterus) is a breeding species in the study area and has at least one pair in the area. The data provided is of decent quality and are based on field data. Conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site, as it relates to the conservation of the species, is excellent.

The **Lesser Spotted Eagle** (Clanga pomarina) is a species that breeds in the study area and has at least four pairs in the area. The data provided is of decent quality and are based on field data. The conservation status, which reflects the degree of habitat protection important to the species and the likelihood of its recovery, is rated A, which means excellent conservation. The population of the species is classified as not isolated but within the limits of its range, and the overall conservation value of the site is good.

The **Eastern Imperial Eagle** (Aquila heliaca) is a resident species in the study area and has at least one pair in the area. The data provided is of decent quality and are based on field data. Conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as not isolated but within the range boundary, and the overall conservation value of the site, which is relevant to the conservation of the species, is excellent.

The **Booted Eagle** (Hieraaetus pennatus) is a species that breeds in the study area and has at least two pairs in the area. The data provided is of decent quality and are based on field data. Conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, meaning excellent conservation. The population of the species is classified as not isolated but within the limits of its range, and the overall conservation value of the site is excellent.

The **Long-legged Buzzard** (Buteo rufinus) is a resident species in the study area and there are at least four pairs in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is adequate.

The **European Honey Buzzard** (Pernis apivorus) is a species that breeds in the study area and has at least eight pairs in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site, as it relates to the conservation of the species, is excellent.

The **Black Stork** (Ciconia nigra) is a breeding species in the study area and there are at least six pairs in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site, as it relates to the conservation of the species, is excellent.

The **Eagle Owl** (Bubo bubo) is a resident species in the study area and there are up to two pairs in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is adequate.

The olive tree Warbler (Hippolais olivetorum) is a species that breeds in the study area and has at least 30 pairs in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site, as it relates to the conservation of the species, is excellent.

The Peregrine Falcon (Falco peregrinus) is a species that breeds in the study area and numbers up to two pairs in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is adequate.

The **White-tailed Eagle** (Haliaeetus albicilla) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2 % of the national population (population criterion C). The data provided is considered insufficient. The conservation status, reflecting the degree of protection of the habitat important to the species and the likelihood of its recovery, is classified as B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is adequate.

The **Montagu's Harrier** (Circus pygargus) is a breeding species in the study area and numbers up to one pair in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is adequate.

The **Black Kite** (Milvus migrans) is a breeding species in the study area and numbers up to one pair in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, meaning excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Bonelli's Eagle** (Aquila fasciata) is a species that breeds in the study area and has up to three individuals in the area. The data provided is of decent quality and based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as not isolated, but is located within the range boundary, and the overall conservation value of the site is excellent. The species is also observed in concentrations in the study area. In this category of the species' relationship with Natura (in concentration), the species numbers up to one individual in the area. The data given are of decent quality and based on field data. The conservation status, reflecting the degree of protection of the habitat important for the species and the likelihood of its recovery, is classified as B, which means good conservation. The population of the species is classified as non-isolated, but is located within the limits of its range, and the overall conservation value of the site is excellent.

The **Levant Sparrowhawk** (Accipiter brevipes) is a breeding species in the study area and numbers up to two pairs in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is adequate.

The **Lesser Kestrel** (Falco naumanni) is a breeding species in the study area and numbers up to one pair in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is good.

The **Red footed Falcon** (Falco vespertinus) is a species that occurs in concentrations in the study area with the population in the study area representing 0 - 2% of the national population (population criterion C). The data provided is considered insufficient. Conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated B, which means good conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is adequate.

The **White Stork** (Ciconia ciconia) is a species that breeds in the study area and has up to five pairs in the area. The data provided is of decent quality and are based on field data. The conservation status, reflecting the degree of habitat protection important to the species and the likelihood of recovery, is rated A, which means excellent conservation. The population of the species is classified as non-isolated with a wide distribution, and the overall conservation value of the site is adequate.

The existing baseline conditions, if defined, shall be.

For the specific Natura 2000 sites under study, as mentioned before, no Management Plan has been prepared and is in effect, and no conservation objectives have been defined based on it. The objective of this SEA is to assess the potential impacts of the project location on the important species, conservation objectives and integrity of the Natura 2000 study sites. Since no Management Plan has been prepared and is in effect, and the conservation objectives for the study area and satisfactory reference values for the species have not been established on the basis of the above Management Plan, the overall conservation objective of the SPAs is taken into account as the maintenance or restoration to a satisfactory conservation status for the important species of Community interest of the sites, based on the content of the Standard data forms for the relevant SPAs.

In the excerpt of the table below, the columns concerning the population data of the species of interest of the Natura 2000 SPAs under study, which are also considered as the desired reference values, have been isolated (Table 25).

Table 25*. Section of the Standard Data Forms of the Natura 2000 network sites GR1110010, GR1130011, GR1110002 and BG0002019, in which the population data of the species of interest are recorded.*

Natura code	**G**	**Code**	**Scientific Name**	**T**	**Size**		**Unit**	**Cat.**	**A|B|C|D**
					Min	**Max**			**Pop.**
GR1110010	B	A079	*Aegypius monachus*	p	4	4	i		A
GR1130011	B	A079	*Aegypius monachus*	c				C	B
GR1110002	B	A079	*Aegypius monachus*	r	21	35	p		A
BG0002019	B	A079	*Aegypius monachus*	p		46	i		C
GR1110010	B	A078	*Gyps fulvus*	c				P	C
GR1110010	B	A078	*Gyps fulvus*	w				P	C
GR1130011	B	A078	*Gyps fulvus*	p	13	13	I		C
GR1110002	B	A078	*Gyps fulvus*	c	115	115	i		A
GR1110002	B	A078	*Gyps fulvus*	p	0	3	p		C
BG0002019	B	A078	*Gyps fulvus*	p		35	i		C
GR1110010	B	A077	*Neophron percnopterus*	r	2	3	p		B

Natura code	G	Code	Scientific Name	T	Size		Unit	Cat.	A|B|C|D
					Min	Max			Pop.
GR1130011	B	A077	*Neophron percnopterus*	r	1	1	p		B
GR1110002	B	A077	*Neophron percnopterus*	c				P	A
GR1110002	B	A077	*Neophron percnopterus*	r	5	5	p		A
BG0002019	B	A077	*Neophron percnopterus*	r	1	2	p		B
GR1110002	B	A075	*Haliaeetus albicilla*	p	1	1	p		B
GR1110002	B	A075	*Haliaeetus albicilla*	w	4	16	i		B
BG0002019	B	A075	*Haliaeetus albicilla*	c				V	C
GR1110010	B	A090	*Aquila clanga*	c				P	C
GR1110002	B	A090	*Aquila clanga*	w	4	7	i		C
GR1110010	B	A089	*Aquila pomarina*	r	4	6	i		B
GR1130011	B	A089	*Aquila pomarina*	r	1	1	p		B
GR1110002	B	A089	*Aquila pomarina*	r	16	19	p		A
BG0002019	B	A089	*Aquila pomarina*	r	4	12	p		C
GR1110010	B	A404	*Aquila heliaca*	c				P	B
GR1130011	B	A404	*Aquila heliaca*	c				R	A
GR1110002	B	A404	*Aquila heliaca*	w	4	4	i		A
BG0002019	B	A404	*Aquila heliaca*	p	1	2	p		A
GR1110010	B	A091	*Aquila chrysaetos*	p	4	5	i		B
GR1130011	B	A091	*Aquila chrysaetos*	p	1	1	p		C
GR1110002	B	A091	*Aquila chrysaetos*	p	4	4	p		B
BG0002019	B	A091	*Aquila chrysaetos*	p	2	3	p		C
GR1110010	B	A092	*Hieraaetus pennatus*	r	3	6	p		B
GR1130011	B	A092	*Hieraaetus pennatus*	r				P	C
GR1110002	B	A092	*Hieraaetus pennatus*	r	20	23	p		A
BG0002019	B	A092	*Hieraaetus pennatus*	r	2	8	p		B
GR1110010	B	A080	*Circaetus gallicus*	r	8	10	i		B
GR1130011	B	A080	*Circaetus gallicus*	r				C	B
GR1110002	B	A080	*Circaetus gallicus*	r	37	40	p		B
BG0002019	B	A080	*Circaetus gallicus*	r	9	11	p		C

Natura code	G	Code	Scientific Name	T	Size		Unit	Cat.	A|B|C|D
					Min	Max			Pop.
GR1110010	B	A403	*Buteo rufinus*	c				P	C
GR1130011	B	A403	*Buteo rufinus*	p				P	C
GR1110002	B	A403	*Buteo rufinus*	r	1	2	p		C
BG0002019	B	A403	*Buteo rufinus*	p	4	5	p		C
GR1110010	B	A072	*Pernis apivorus*	r	8	10	i		C
GR1130011	B	A072	*Pernis apivorus*	r				P	C
GR1110002	B	A072	*Pernis apivorus*	r	15	16	p		C
BG0002019	B	A072	*Pernis apivorus*	r	8	25	p		C
GR1110010	B	A074	*Milvus milvus*	c				P	B
GR1110002	B	A074	*Milvus milvus*	c				P	C
GR1110010	B	A030	*Ciconia nigra*	r	4	6	i		B
GR1130011	B	A030	*Ciconia nigra*	r				P	B
GR1110002	B	A030	*Ciconia nigra*	r	31	35	p		A
BG0002019	B	A030	*Ciconia nigra*	r	6	18	p		B
GR1110010	B	A215	*Bubo bubo*	p	2		p		C
GR1130011	B	A215	*Bubo bubo*	p	1	1	p		C
GR1110002	B	A215	*Bubo bubo*	p	4	4	p		C
BG0002019	B	A215	*Bubo bubo*	p	2	2	p		C
GR1110010	B	A429	*Dendrocopos syriacus*	p	11	11	i/sq.km		C
GR1130011	B	A429	*Dendrocopos syriacus*	p				C	C
GR1110002	B	A429	*Dendrocopos syriacus*	p	1	11	i/sq.km		C
BG0002019	B	A429	*Dendrocopos syriacus*	p	200	350	p		C
GR1110010	B	A238	*Dendrocopos medius*	p				P	C
GR1130011	B	A238	*Dendrocopos medius*	p				C	C
GR1110002	B	A238	*Dendrocopos medius*	p				P	C
BG0002019	B	A238	*Dendrocopos medius*	p	100	150	p		C
GR1110010	B	A379	*Emberiza hortulana*	r				P	C
GR1130011	B	A379	*Emberiza hortulana*	r				C	C
GR1110002	B	A379	*Emberiza hortulana*	r	1	17	i/sq.km		C

Natura code	G	Code	Scientific Name	T	Size		Unit	Cat.	A|B|C|D
					Min	Max			Pop.
BG0002019	B	A379	*Emberiza hortulana*	r	67	194	p		C
GR1110010	B	A338	*Lanius collurio*	c	53	53	i/sq.km		C
GR1110010	B	A338	*Lanius collurio*	r				C	C
GR1130011	B	A338	*Lanius collurio*	r	8	8	i/sq.km		C
GR1110002	B	A338	*Lanius collurio*	r	2	28	i/sq.km		C
BG0002019	B	A338	*Lanius collurio*	r	4500	5500	p		C
GR1110010	B	A442	*Ficedula semitorquata*	r				P	C
GR1130011	B	A442	*Ficedula semitorquata*	r				R	B
GR1110002	B	A442	*Ficedula semitorquata*	r				P	C
BG0002019	B	A442	*Ficedula semitorquata*	r	2	25	p		C
GR1110010	B	A439	*Hippolais olivetorum*	r				P	C
GR1130011	B	A439	*Hippolais olivetorum*	r				P	C
GR1110002	B	A439	*Hippolais olivetorum*	r				P	C
BG0002019	B	A439	*Hippolais olivetorum*	r	30	40	p		C
GR1110010	B	A447	*Emberiza caesia*	r				P	C
GR1110002	B	A447	*Emberiza caesia*	r				P	C
GR1110010	B	A073	*Milvus migrans*	c				P	C
GR1110002	B	A073	*Milvus migrans*	r	0	1	p		C
GR1110002	B	A073	*Milvus migrans*	w	28	53	i		
BG0002019	B	A073	*Milvus migrans*	r	2	2	p		C
GR1110010	B	A094	*Pandion haliaetus*	c				P	C
GR1110002	B	A094	*Pandion haliaetus*	c				P	C
GR1110010	B	A709	*Falco peregrinus*	p				P	C
GR1130011	B	A709	*Falco peregrinus*	p				R	C
GR1110002	B	A709	*Falco peregrinus*	p	3	4	p		C
BG0002019	B	A103	*Falco peregrinus*	r	2	2	p		C
GR1110010	B	A081	*Circus aeruginosus*	c				P	C
GR1130011	B	A081	*Circus aeruginosus*	c				P	C

Natura code	G	Code	Scientific Name	T	Size		Unit	Cat.	A|B|C|D
					Min	Max			Pop.
GR1110002	B	A081	*Circus aeruginosus*	p	2	3	p		B
GR1110002	B	A081	*Circus aeruginosus*	c				P	B
GR1110010	B	A082	*Circus cyaneus*	c				P	C
GR1130011	B	A082	*Circus cyaneus*	c				P	C
GR1110002	B	A082	*Circus cyaneus*	w	30		i		B
GR1110010	B	A083	*Circus macrourus*	c				P	C
GR1130011	B	A083	*Circus macrourus*	c				R	C
GR1110002	B	A083	*Circus macrourus*	c				P	C
GR1110010	B	A084	*Circus pygargus*	c				P	C
GR1130011	B	A084	*Circus pygargus*	c				P	C
GR1110002	B	A084	*Circus pygargus*	c				P	C
BG0002019	B	A084	*Circus pygargus*	r	1	1	p		C
GR1110010	B	A707	*Aquila fasciata*	c				P	C
GR1110002	B	A707	*Aquila fasciata*						
BG0002019	B	A093	*Aquila fasciata*	c	1	1	i		A
BG0002019	B	A093	*Aquila fasciata*	r		3	i		A
GR1110010	B	A402	*Accipiter brevipes*	r				P	C
GR1130011	B	A402	*Accipiter brevipes*	r	2		p		C
GR1110002	B	A402	*Accipiter brevipes*	r	3	4	p		C
BG0002019	B	A402	*Accipiter brevipes*	r	2	2	p		C
GR1110010	B	A095	*Falco naumanni*	c				P	C
GR1130011	B	A095	*Falco naumanni*	c				P	C
GR1110002	B	A095	*Falco naumanni*						
BG0002019	B	A095	*Falco naumanni*	r		1	p		A
GR1110010	B	A100	*Falco eleonorae*	c				P	C
GR1130011	B	A100	*Falco eleonorae*	c				P	C
GR1110002	B	A100	*Falco eleonorae*	c				P	C
GR1110010	B	A097	*Falco vespertinus*	c				P	C
GR1110002	B	A097	*Falco vespertinus*	c				P	C
BG0002019	B	A097	*Falco vespertinus*	c				P	C
GR1110010	B	A098	*Falco columbarius*	c				P	C
GR1110002	B	A098	*Falco columbarius*	c				P	C
GR1110010	B	A667	*Ciconia ciconia*	c				P	C
GR1130011	B	A667	*Ciconia ciconia*	c				P	C
GR1110002	B	A667	*Ciconia ciconia*	r	25	25	p		C
BG0002019	B	A031	*Ciconia ciconia*	r	5	5	p		C
GR1110010	B	A223	*Aegolius funereus*	p				P	B

Main pressures and threats they are under

The pressures and threats to the species of interest of Annex I of Directive 2009/147/EC have been fully analysed in previous chapters of this Special Ecological Assessment. Also, with regard to the pressures and threats referred to in the Standard Data Forms of the Natura 2000 study sites have been reported in a previous chapter of this SEA (see Tables 5, 6, 7 and 8 respectively). The pressures and threats of the IBAs GR008 and GR003 have also been reported in the same chapter.

Ecological functions

The broader study area is located between the Dasos Dadia National Park and the Koilada Filiouri at the western end of Evros Prefecture. It is mainly covered by oak and beech forests with small groups of pine trees and crossed by the Diavolorema creek of Dereio. The central part and the north-east are dominated by partially forested areas with scattered old oak trees, mainly used by free grazing livestock. The traditional agricultural activities of the local inhabitants (e.g., nomadic livestock farming, small-scale agriculture) have played a vital role in the conservation of the ecosystems, maintaining sparse oak forests in part of the area. The mature oak trees that remain are used for pruning, i.e., collecting branches with leaves for goats to feed on in winter. Oak forests are also used for firewood production, while beech forests and pine reforestation are used for commercial timber. The area is important for breeding and migratory birds of prey and non-migratory species in the forests, scrublands and rural areas and is vital for the feeding and survival of Aegypius monachus. The whole project is located within the Important Bird Area of Greece (BIA) with code GR003 and within the Natura 2000 network area SPA GR1110010 and name 'Mountain Evros - Valley of Dereio'. Furthermore, the wider area of the project site is located on the border between Greece and Bulgaria (Eastern Rhodope).

Evolution tendencies of the Research Area

The study area is located within an area of high wind potential and therefore there are many requests for the installation of wind farms (the area is included in a Wind Priority Area 1), which are reviewed on a case-by-case basis and implemented only if they are assessed as not likely to damage the integrity and conservation status of the Natura 2000 network sites of the wider study area. Furthermore, the project under consideration may also bring direct benefits to the settlements within the wider study area, with an increase in temporary or permanent jobs because of its development.

7. Due Impact Assessment Analysis and Evaluation of the Impacts

In the previous sections the tables with the species recorded in the field research area have already been presented, the important species of the protected areas of the Natura 2000 network SPAs GR1110010, GR1130011, GR1110002 and BG0002019, as well as the species of the Important Bird Areas of Greece GR003 and GR008 have been mentioned, their protection status, their ecological requirements, threats, etc. have been mentioned and the reasoning on the basis of which the important species for the project area have been listed in the respective tables has been stated.

The study area examined is, as already mentioned, located within an area of high wind potential and as such there are applications for wind farms, which are considered on a case-by-case basis and implemented if assessed as not likely to harm the integrity and conservation status of the area.

Impact assessment methodology/framework

In order to assess and evaluate the potential impacts of the proposed WPP on the above mentioned species of avifauna important for the area, the ecological sensitivity of the species will be taken into account, the sensitivity to impacts from wind farm siting and other threats to these species and the estimated magnitude of each impact, based on field surveys and analyses (spatial distribution, height and behavior of movements, critical nesting, roosting and feeding habitats, etc.).

Based on the above, the significance of the impact on the conservation status of each of the above species is assessed, i.e., the extent to which the project under consideration will worsen their conservation status or efforts to restore them. In the absence of satisfactory or baseline values for the study area that can be derived from a management plan for the protected area, the values listed in the standardized record forms for some of the important species can be defined as such.

As mentioned above, the potential impacts of the installation and operation of wind farms on avifauna populations are divided into collision mortality, which only concerns the operational phase of the project and for which the magnitude of the impact on the installed turbines or power transmission network is assessed, and direct habitat loss, which concerns both the construction and operational phases of the project and is essentially assessed based on the magnitude of the impact on populations residing for at least some period of time (breeding, overwintering, feeding area) in the area of installation by the possible displacement of some individuals.

In view of the above and given that the proposed installation of the WPP project will be installed in a small area (within which an even smaller intervention will take place), within habitat types that are abundant in the area, it is estimated a priori that the most significant potential impact to be investigated relates to collision mortality. No direct habitat loss is expected to occur as the availability of similar habitat to existing habitat in the wider area is high in the WPP site. In addition, the EIA foresees the horticultural restoration of the intervention areas.

Similarly, the impact from disturbance and movement barriers is considered negligible as the EIA and the present proposals foresee the cessation of the installation of the WPP during the breeding season of birds, and the high availability of corresponding habitat types in the area and the small size of the intervention area preclude habitat fragmentation and habitat discontinuity. As mentioned above, the intervention within the production license polygons of the studied wind farm will be much smaller than their total area, since only the areas within it that will be used for the installation of each wind turbine will be affected (foundation of the wind turbine, infrastructure works, etc.), while the construction of access roads will be limited due to the existing road network of the wider installation area and essentially will be limited to sections of new pavements for connecting the existing network with the positions of the wind turbines. Finally, the wider project area is not fenced off and disturbance, during the construction phase, will be of short duration and intensity and ultimately reversible after the end of the construction works.

Synergistic Impacts

For the assessment and evaluation of the effects on bird populations of the project under consideration, the synergistic effects of existing, approved, or planned projects are also taken into account as assessed in the interpretative guide for the management of Natura 2000 sites on the basis of Article 6 of Council Directive 92/43/EEC of 21st May 1992 on the conservation of natural habitats and of wild fauna and flora (EE L 206/22.07.1992).

As mentioned above in the impact assessment methodology, the impact categories that will be considered are *mortality due to collision, direct habitat loss,* and *disturbance and displacement due to barrier creation*.

The synergistic impacts from the installation of a project in an area result from the cumulative effect of all types of impacts of these projects (approved or planned) and mainly concern the avifauna of the area. According to the international literature and the Guidelines, synergistic effects can be considered at two levels. Projects located within a very short distance and radius from the project under consideration (usually < 2 km) and those located within a larger radius and area (usually between 2 km and 10 km). The reason is that in the first case the project in question may be small in size with little or no impact, mainly on bird species, but within a short radius many other small or larger projects may be located and ultimately cause a greater impact on the species. In the second case, irrespective of the assessment of the specific project, numerous projects, regardless of the size of the impact, may be located within a larger radius and multiply the impact of the project under consideration. It is considered that the worthiest of reference and examination are the WPPs that have been granted an operating, an installation, and a production license within a radius of 10 km from the project under consideration.

In the wider installation area of the project and within a radius of 10 km there are two wind farms, which are located west of the project at an average distance (in a straight line) of 2.18 km and 4.79 km respectively (Map 100). The aforementioned wind farms PATRIARCHIS and MIKRONOROS, have a capacity of 40.3 MW and 33.60 MW and consist of 31 and 8 wind turbines respectively (Source R.A.E., available on 12/06/2024).

In the wider project area and within a radius of 10 km, there are no wind farms with an installation permit (Source: R.A.E., available on 12/06/2024). The nearest wind farm with an installation permit is located at an average distance (in a straight line) of more than 100 km.

In the wider area of the project under study, and within a radius of 10 km, there are 15 WPPs that have received a production license (source: R.A.E. available on 12/06/2024), with a total capacity of 470.7 MW that consist of 115 wind turbines. It should be noted that the LOFOS-POULIA, PATRIOTIS and TSOLIAS wind farms, consisting of 21 wind turbines, are partially located within the 10 km radius area, with 11 out of 21 wind turbines located outside this area. Therefore, the total number of wind turbines to be constructed (under construction) within a 10 km radius of the project under consideration is 104 wind turbines.

With regard to the protected areas under study and in order to take into account the synergistic effects of the project under consideration, the study team of this Special Environmental Assessment has chosen to consider the wider boundaries of the entire area included in the main SPA GR1110010 under study, but also the nearest Greek SPA GR1130011, as almost all the wind turbines already installed are located (operating licence) in the wider area. Therefore, the resulting area, i.e. the area resulting from the merging of the boundaries of the two above-mentioned areas, will henceforth be referred to as the 'Synergistic Impact Assessment Area' (SIAA) (Map 101).

Therefore, within the SIAA, 14 WPPs (nine on site and five partially on site) are licensed (Map 102), with a total capacity of 314.6 MW, occupying a total area of 1,053.88 ha (total area of the polygons within the SIAA - of which five WPPs are partially within the SIAA, only the area of the polygons within the polygons was measured) and consisting of 188 wind turbines. It should be noted that out of five WPPs that are partially located within the SIAA (WPPs: MAGULA KAZAKOU - DIPLON, SARAKATSANAIKA, MONASTIRI II, GERAKI, FANTAROS) and consist of 46 wind turbines, only 19 of them are located within the SIAA. The total number of wind turbines within the SIAA is therefore 161.

In terms of WPPs with a production license within the SIAA, there are 45 WPPs (including the one under study) in the production license stage (Map 102). Since some of the above WPPs are partially located within or on the boundaries of the synergistic impact study area, both the area of the production license polygons of the above WPPs located within the SIAA and the total number of wind turbines located within them are counted in the analysis and assessment of synergistic impacts. Thus, of the total of 3.463,95 ha, an area representing the sum of the production license polygons of the 45 wind turbines (including the one under study) located either within or partially within or within the boundaries of the synergistic impact study area, 3.023,85 ha are located within the study area, while of the total of 160 wind turbines comprising the above wind turbines (including the 7 wind turbines of the project under study), 146 are located within the synergistic impact study area.

As for the WPPs assessed within the SIA, they amount to 4 WPPs (Map 102). In this case, the WPPs are entirely located within the SIA, have an area of 806.20 ha and consist of a total of 21 wind turbines.

The number of installed wind farms listed above is high for the region (14 wind farms - nine within and five partially within). Given that the above installed wind farms are environmentally licensed, it appears that it has already been determined that the synergistic effects between them cannot cause adverse effects in the synergistic impact assessment area. As for the wind farms in the licensing stage under production, and although the number of wind turbines to be installed is large, they may receive a negative opinion until the stage of obtaining the operating license, in which case it is not possible to assess a wind farm for its synergistic impacts in relation to wind farms that may never be built. However, to better address synergistic effects, all wind farms within the synergistic assessment area (both existing wind farms and those currently being assessed for production) are considered below. In addition, in order to minimize the possibility of adverse effects due to an increase in mortality of important seasonal or permanent resident avifauna species, additional measures to address the potential impacts are being proposed in a following section, based on the new technologies provided which in most of the already existing parks in the wider region do not exist.

Mortality due to collision

As mentioned above, the risk of birds colliding with wind turbines is the most significant direct risk from wind farm operation. The species most at risk are scavengers - large predatory species that mainly use warm updrafts and fly passively for most of their flight activity. Due to their large size, these species do not have the ability to manoeuvre quickly to avoid obstacles such as wind turbines or above-ground power lines, which in some cases accompany these projects. The direct loss of individuals due to impact can be particularly detrimental to populations of species at high risk of impact, since they are K-selection species in terms of their evolutionary growth strategies (long biological cycle, low capacity to produce offspring with a long time to sexual maturity and high levels of mortality, low population replacement). Therefore, the risk of collision for these species can also have a significant impact at the population level, although other threats, such as the consumption of poisoned baits, may be even more dangerous (at the population level) due to their social behavior and group feeding behavior. Among the species at considerable risk of collision are, in descending order, large predators (scavengers, eagles, etc.), other large species of avifauna such as storks, pelicans, swans, herons, etc. and, to a lesser extent, medium-sized raptors (falcons).

WWF Greece conducted a systematic study of the impact on birds of prey in Thrace during 2008-2010. In 2008-2009, the research was carried out on 127 of the 163 wind turbines installed at that time in the prefectures of Evros and Rodopi, with a systematic search for dead birds every 14 days. In 2009-2010, the research was limited to 88 of the 163 wind turbines mentioned above, selected based on the highest flight rate based on the data of the previous period, and the sampling effort was increased by making daily sweeps. Fourteen raptors were found dead during the whole period described above. No further systematic recording of this effort has been undertaken in subsequent years, and any recorded incidents are either incidental, through tracking the satellite signal of individuals carrying transmitters, or through surveys during studies undertaken as part of the preparation of Special Ecological Assessments or during the implementation of monitoring programs in the developing or established WPPs. Most mortalities occur in the scavenging species Cinereus vulture and Griffon vulture.

According to the impact victim tracking program in 9 existing WPPs in the Thrace region in 2009-2010, the estimated adjusted mortality rate of birds of prey was calculated to be 0.152 and 0.173 for raptors and vultures, respectively, per year and per turbine. Taking these estimates into account, the annual mortality rates for raptors and vultures for the existing wind farms within the SIAA ('Synergistic Impact Assessment Area), which includes 161 wind turbines, are 24.47 and 27.85, respectively, while the mortality rates for raptors and vultures, including all 10 proposed wind farms in the proposed WPP, are 25.99 and 29.58, respectively. In the case, under which all the WPPs under licensing will be licensed (this estimate is the worst-case scenario), within the SIAA there will be 411 wind turbines (installed and under production licensing), the estimated mortality rates will be 62.47 and 71.10 predators and vultures, respectively. The above reported rates are very high and it is estimated that if they are close to reality they would result in losses to the populations of the above species operating in the area, however, the actual mortality within the entire "'Synergistic Impact Assessment Area " may differ significantly (estimated to be much lower) as the above based estimates refer to a wider geographical area with a significantly higher presence of scavenging and predator species.

In conclusion, with regard to the project under study, the contribution that its construction may have on the overall cumulative impact due to striking energy infrastructure of the species of interest (with emphasis on scavengers - large predators, but also on other large species of interest, such as e.g. the black stork) is initially estimated to be relatively high in relation to all existing and under-licensed energy infrastructure, as demonstrated above. However, in the above it should be borne in mind that the installed wind farms in which the survey was conducted from which the adjusted raptor mortality rates were derived (0.152 and 0.173 for raptors and vultures respectively) were located in a wider geographical area with a significantly higher presence of scavenging and predatory species, and were operating with almost no mitigation measures to address the potential negative impacts, and to avoid conflicts in the project under study, a plethora of corresponding measures to avoid the occurrence of adverse weather conditions (e.g., automated wind turbine shutdown system, wind turbine shutdown in conditions of limited visibility due to cloud cover and extremely adverse weather conditions, painting of wind turbine blade with black paint, complete shutdown of the wind park during sensitive periods, undergrounding of the power transmission line, etc.). Therefore, **the contribution that its construction may have on the overall cumulative impact due to strikes** on energy infrastructure of the species of interest (with emphasis on scavengers - large predators, but also on other large species of interest, such as the black stork) **is estimated to be low**.

Loss and degradation of habitats

All installed wind farms and their associated projects may restrict areas suitable for use by bird species, such as areas or sites suitable for nesting, roosting, cover, foraging, etc. All the above projects, or more precisely the most significant in terms of causing adverse effects, are usually located within the polygons of the WPPs, although associated projects such as access roads may extend for several kilometers outside these polygons. However, the otherwise dense network of forest roads within productive forests, the network of roads connecting mountain villages, the network of roads serving other purposes such as rural roads, the network of roads serving livestock needs, etc., which often already exist in the areas where the new WPPs are located, are not easy to separate in terms of their impact from those parts of the road network that are also used as access roads to the WPPs.

Several assumptions were made in the assessment of this paragraph, such as that all land within the polygons of the approved WPPs in the area is the habitat that will be lost to avifauna (strict approach), although the extent of habitat loss will be much less than this as the intervention within the polygons of the WPPs will be much less (approximately 5-10% of the polygons). It was considered appropriate to estimate this using this strict approach as it was not possible to precisely estimate the share of responsibility of each WPP for the increase in road network density (as it is no longer known which route will be followed for each planned WPP, whether this will follow existing road construction or new road construction, etc.).

Map 1: Map of affected areas due to habitat loss within the entire synergistic impact study area if all WPPs under production and assessment are licensed in

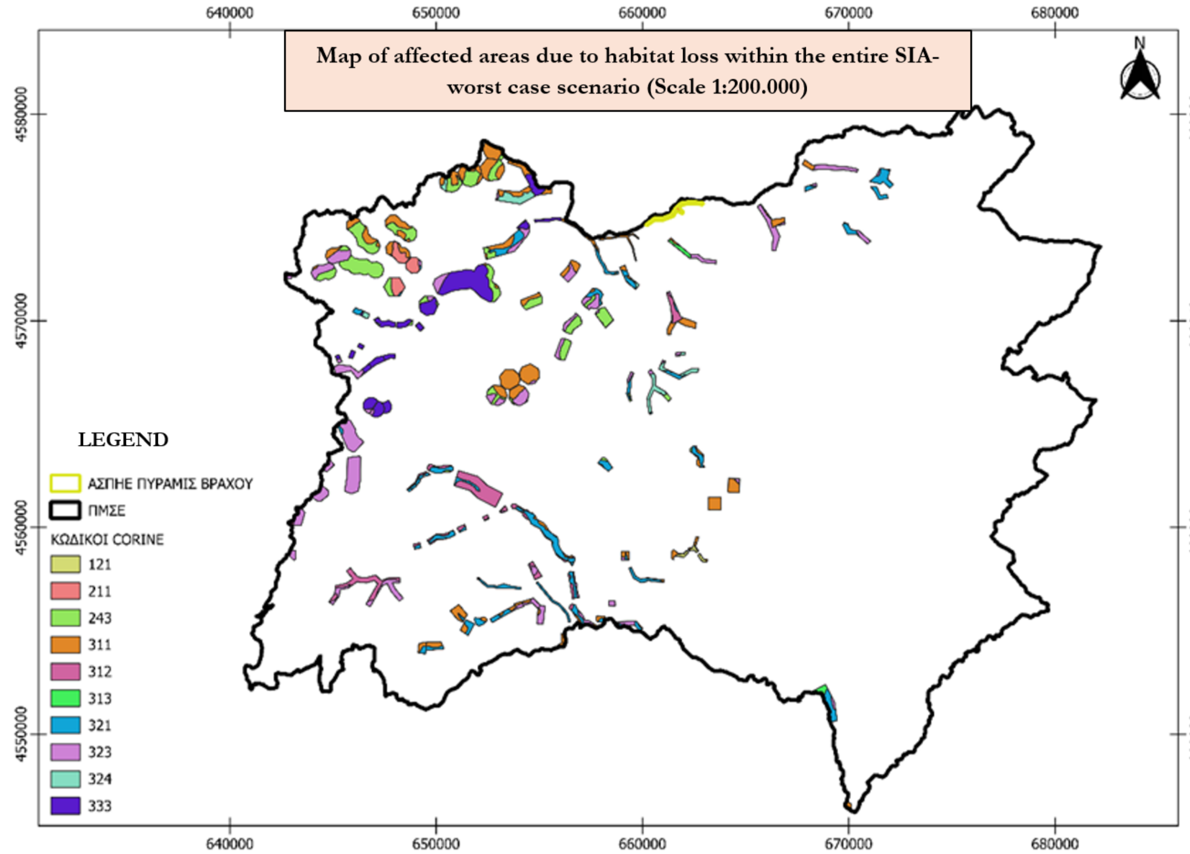
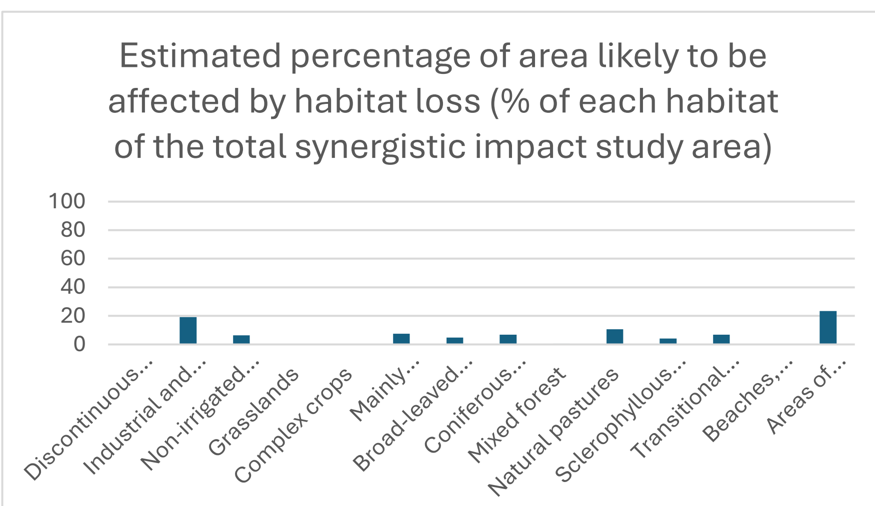


Table 26: *Estimation of habitat loss (in hectares) if all licensed WWPs (licensing stage under production) were to be approved, in synergy with existing WWPs within the overall synergistic impact study area considered (worst case scenario).*

Explanation of Corine land cover 2018 codes	Corine land cover 2018 codes	Area covered in the total synergy study area (ha)	Area of the habitat coverage of all the polygons of existing and under-licensed (in production) WPPs within the entire synergistic impact study area (ha)	Estimated percentage of area likely to be affected by habitat loss (% of each habitat of the total synergistic impact study area)
Discontinuous urban tissue	112	51,93	-	-
Industrial and commercial zones	121	109,29	20,82	19,05
Non-irrigated arable land	211	2017,77	129,34	6,41
Grasslands	231	195,31	-	-
Complex crops	242	375,62	-	-
Mainly agricultural land with significant natural vegetation	243	9953,51	756,55	7,60
Broad-leaved forest	311	23385,54	1134,13	4,85
Coniferous forest	312	5979,40	406,62	6,80
Mixed forest	313	7500,77	38,61	0,51
Natural pastures	321	6899,88	730,36	10,59
Sclerophyllous vegetation	323	25092,14	1046,46	4,17
Transitional wooded and bushy areas	324	2316,61	157,36	6,79
Beaches, dunes, sandy beaches	331	56,16	-	-
Areas of sparse vegetation	333	2407,08	563,86	23,43

Figure 1: Estimated percentages of area that may be affected by habitat loss (% of each habitat of the entire synergistic impact study area (worst case scenario)



Map 2: Map of affected areas due to habitat loss within the entire synergistic impact study area in case only the Wind Power Plant under consideration is licensed in synergy with the existing ones (best case scenario)

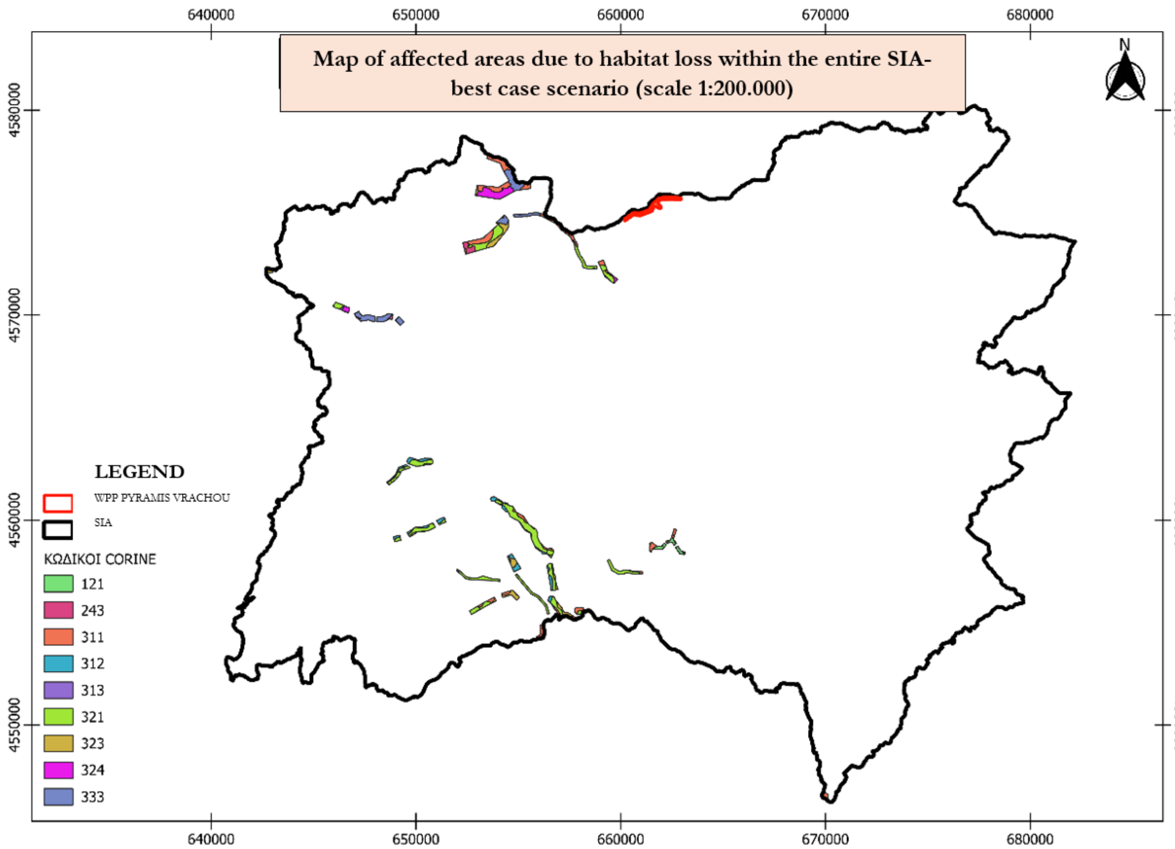
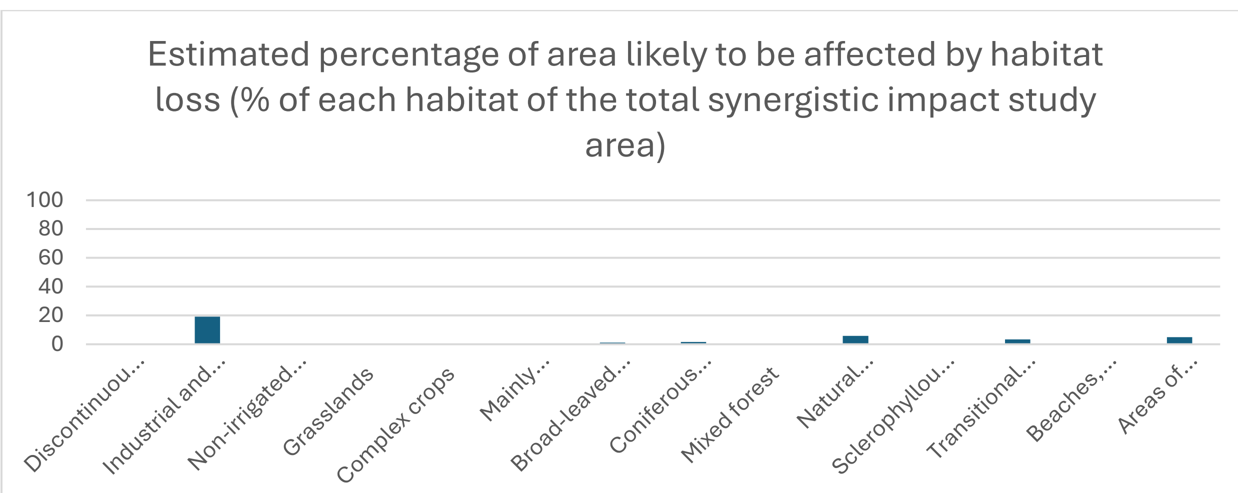


Table 47: *Estimation of habitat loss (in ha), in the case that out of all the licensed WPPs (under production), only the project under study is licensed, in synergy with the existing WPPs, within the considered synergistic impact study area (best case scenario)*

Explanation of Corine land cover 2018 codes	Corine land cover 2018 codes	Area covered in the total synergy study area (ha)	Area of the habitat coverage of all the polygons of existing and under-licensed (in production) WPPs within the entire synergistic impact study area (ha)	Estimated percentage of area likely to be affected by habitat loss (% of each habitat of the total synergistic impact study area)
Discontinuous urban tissue	112	51,93	-	-
Industrial and commercial zones	121	109,29	20,82	19,05
Non-irrigated arable land	211	2017,77	-	-
Grasslands	231	195,32	-	-
Complex crops	242	375,62	-	-
Mainly agricultural land with significant natural vegetation	243	9953,51	24,55	0,25
Broad-leaved forest	311	23385,54	258,15	1,10
Coniferous forest	312	5979,40	90,86	1,52
Mixed forest	313	7500,77	0,08	-
Natural pastures	321	6899,88	406,32	5,89
Sclerophyllous vegetation	323	25092,14	97,37	0,39
Transitional wooded and bushy areas	324	2316,61	77,49	3,34
Beaches, dunes, sandy beaches	331	56,16	-	-
Areas of sparse vegetation	333	2407,08	121,06	5,03

Figure 2: Estimated percentages of area that may be affected by habitat loss (% of each habitat of the entire synergistic impact study area (best case scenario)



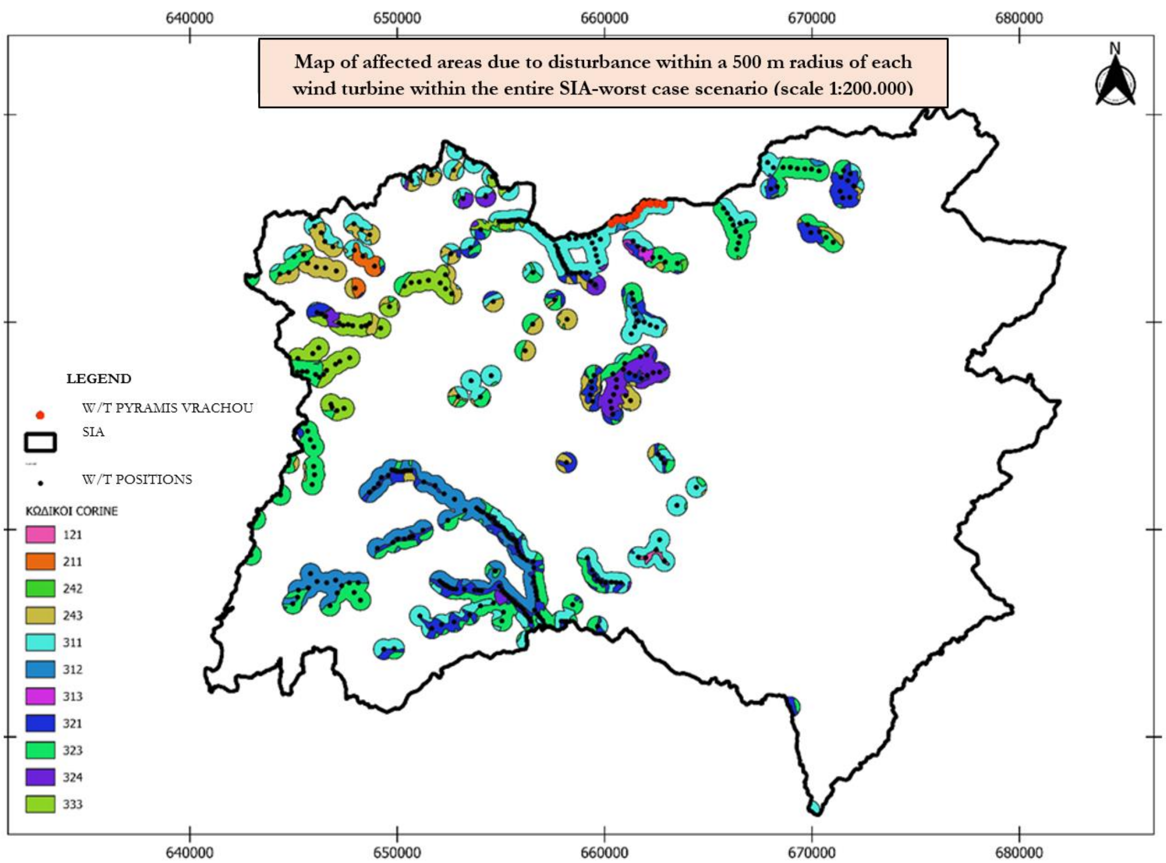
From the percentages derived from Table 26 above, in the case that all of the licensed WPPs (licensing stage under production) (worst case scenario) would be licensed in synergy with the existing ones within the synergistic impact study area, the estimated losses in descending order are in the following habitats: Areas of sparse vegetation, industrial and commercial zones, natural pastures, transitional wooded and bushy areas, coniferous forest, broad- leaved forest, sclerophyllous vegetation, Mainly agricultural land with significant natural vegetation and mixed forest. The above habitats dominate according to the land cover database and mapping (Corine land cover 2018) reflected in the respective maps (see map 7), covering a total of more than 96% (121: 0.13%, 243: 11.53%, 311: 27.09%, 312: 6.92%, 313: 8.69%, 321: 7.99%, 323: 29.06%, 324: 2.68%, 333: 2.79%) the area of the synergistic impact study area.

However, according to Table 27 above and the percentages calculated therein, if only the project under study (best case scenario), out of the total number of WPPs to be licensed (licensing stage under production), were to work in synergy with the existing WPPs, the estimated habitat losses would be minimal and would affect, in descending order, the following habitats: Industrial and commercial areas, natural pastures, areas with sparse vegetation, transitional wooded and bushy areas, coniferous forest, broad-leaved forest, sclerophyllous vegetation, mainly agricultural land with significant natural vegetation and mixed forest. According to the land cover database and mapping (Corine land cover 2018), the above habitats dominate the respective maps (see Map 7), totaling over 96% of the synergistic impact study area. Therefore, since the study project is located within habitats that are abundant throughout the synergistic impact study area, due to the fact that the contribution of this project to synergistic/cumulative impacts is small (consisting of ten wind turbines), it is considered that this project will have a minor impact on habitat loss/degradation in the study area and the region in general.

Disturbance, displacement, and barrier creation

The expected cumulative impacts due to disturbance during both the construction and operational phases of the WPPs are related to the construction works of the WPPs and their associated infrastructure, as well as the operation of the WPPs and the use of the associated works (e.g. roads), which have been associated with the displacement of species due to disturbance and avoidance efforts. Regarding the construction phase, the impact of disturbance will last for a limited period, therefore any potential impact will be short term, non-transient and reversible.

The assessment of cumulative impacts due to displacement, either as an indirect effect of disturbance or for avoidance of the WPPs and its associated works that may be encountered by bird species, was carried out on the assumption that the total activity of the species is halved within 500 m of the wind turbine installation sites from the wind turbines. Based on this, the total area within which a halving of the activity of species of interest is expected to occur was calculated, which was assumed to include areas with scattered patches of necessary resources for avifauna, such as suitable nesting, cover, roosting, foraging, etc. As noted above, in any areas/locations of suitable habitat included within the above areas where impacts due to disturbance and displacement are expected to occur, there would not be a complete cessation of activity for avian species, therefore, there is no question of loss of all such habitat (Map 120, Tables 28 and 29).

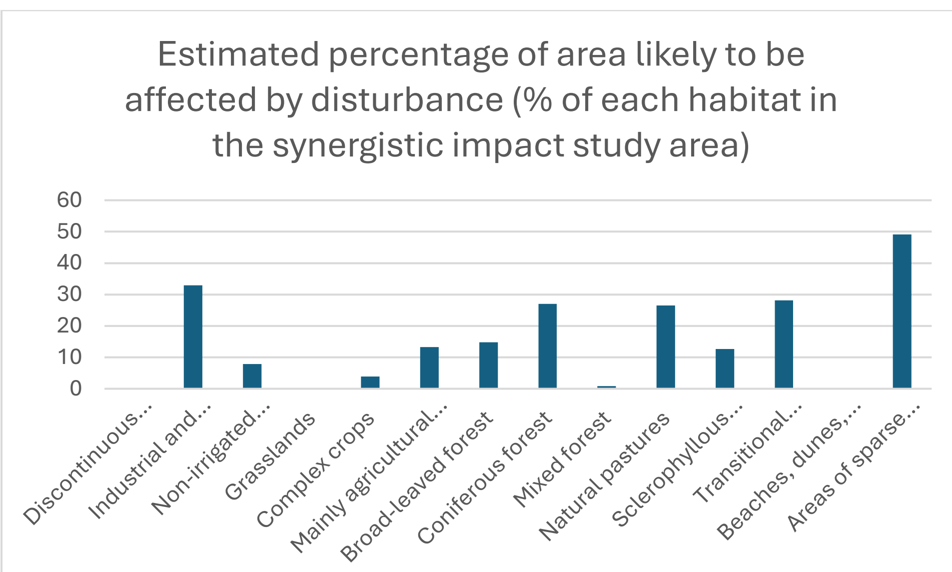


Map 808: *Map of the affected habitat area due to disturbance within a 500 m radius of each wind turbine, in case of approval of all licensed WPPs (licensing stage under production) in synergy with the existing ones, within the considered synergistic impact study area (worst case scenario).*

Table 28: *Estimation of the affected area (in ha) of degradation due to nuisance within 500 m radius of each wind turbine, in case of licensing of all WPPs under licensing (licensing stage under production), in synergy with existing WPPs, within the considered synergist impact study area (worst case scenario)*

Explanation of Corine land cover 2018 codes	Corine land cover 2018 codes	Area covered in the total synergy study area (ha)	Estimated area of affected habitat for species of interest around the perimeter of all existing and pending permits W/T (500 m radius) within the total synergistic impact study area (ha)	Estimated percentage of area likely to be affected by disturbance (% of each habitat in the synergistic impact study area)
Discontinuous urban tissue	112	51,93	-	-
Industrial and commercial zones	121	109,29	36,01	32,95
Non-irrigated arable land	211	2017,74	158,84	7,87
Grasslands	231	195,32	-	-
Complex crops	242	375,61	14,51	3,86
Mainly agricultural land with significant natural vegetation	243	9953,34	1321,77	13,28
Broad-leaved forest	311	23385,16	3455,22	14,78
Coniferous forest	312	5979,31	1615,63	27,02
Mixed forest	313	7500,65	61,09	0,81
Natural pastures	321	6899,77	1830,70	26,53
Sclerophyllous vegetation	323	25091,73	3174,10	12,65
Transitional wooded and bushy areas	324	2316,57	650,96	28,10
Beaches, dunes, sandy beaches	331	56,16	-	-
Areas of sparse vegetation	333	2407,04	1182,14	49,11

Figure 3: Graph showing the percentage of area that may be affected by the disturbance (% of each habitat in the synergistic impact study area - worst case scenario)



The percentages of areas calculated in Table 28 above are for the case where all WPPs under licensing are licensed (licensing phase under production), in synergy with the existing WPPs (worst case scenario). The habitats that will be lost due to displacement, relative to the total available suitable habitat within the synergistic impact study area, are in descending order: Areas of sparse vegetation, natural pastures, industrial and commercial areas, transitional wooded and bushy areas, coniferous forest, broad-leaved forest, sclerophyllous vegetation, mainly agricultural land with significant natural vegetation, mixed forest, complex crops and non-irrigated arable land. According to the database and land cover mapping (Corine land cover 2018), the above habitats dominate in the corresponding maps (see Map 18), accounting for a total of more than 99% (121: 0. 13%, 211: 2.34%, 243: 11.53%, 311: 27.09%, 312: 6.92%, 313: 8.69%, 321: 7.99%, 323: 29.06%, 324: 2.68%, 333: 2.79%) of the synergistic impact study area and are abundant outside this area.

Map 3: Map of the affected habitat area due to disturbance within a 500 m radius of each Wind Turbine, in case of approval of all Wind Power Plants under licensing (licensing stage under production) in synergy with the existing ones, within the considered synergistic impact study area (best case scenario).

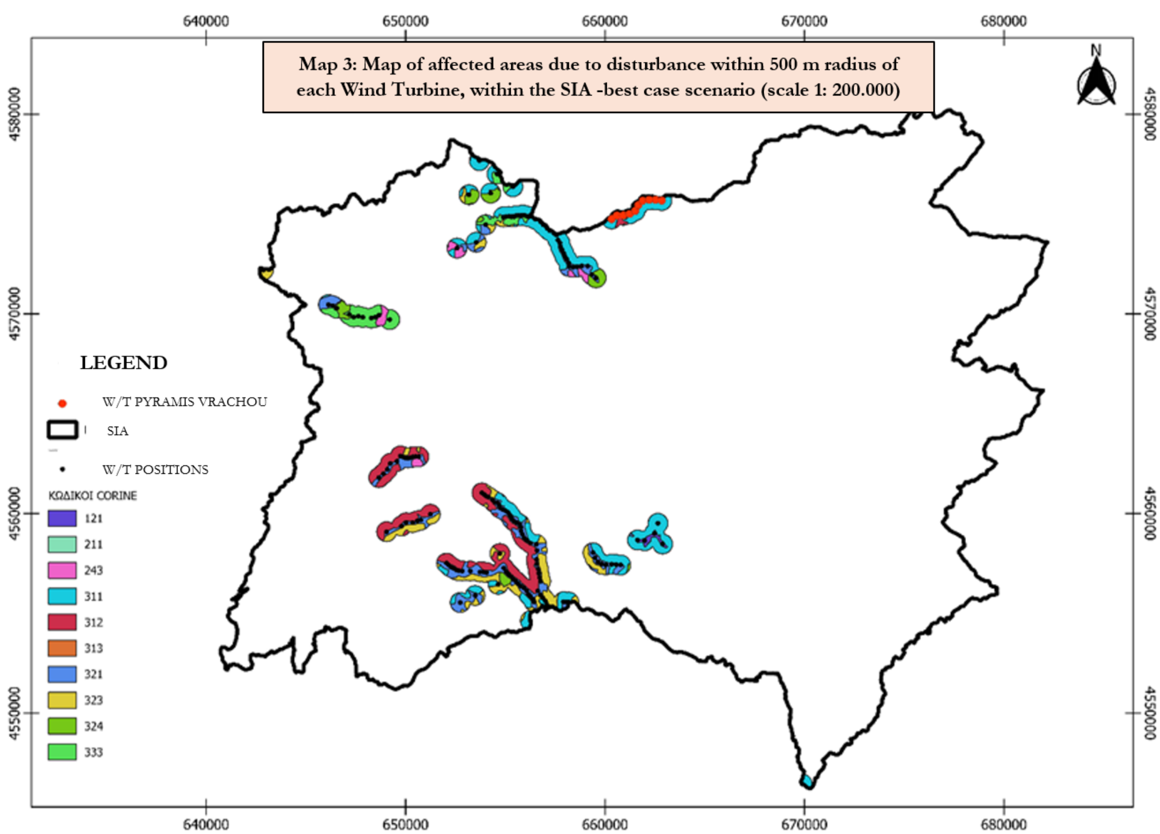
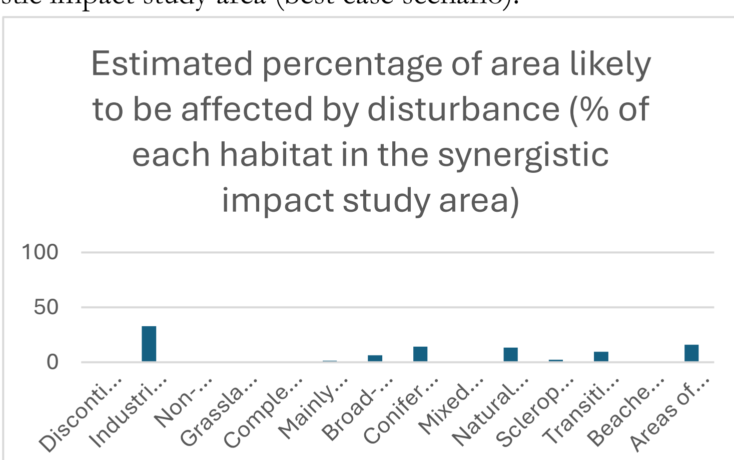


***Table 29**: Estimation of the affected area (in hectares) of nuisance degradation within a 500m radius of each WPP, if only the study project is approved, in synergy with existing WPPs, within the synergistic impact study area (best case scenario).*

Explanation of Corine land cover 2018 codes	Corine land cover 2018 codes	Area covered in the total synergy study area (ha)	Estimated area of affected habitat of species of interest around the perimeter of the licensed A/C of the project under study in synergy with the existing ones (500 m radius) (ha)	Estimated percentage of area likely to be affected by disturbance (% of each habitat in the synergistic impact study area)
Discontinuous urban tissue	112	51,93	0,00	0,00
Industrial and commercial zones	121	109,29	36,01	32,95
Non-irrigated arable land	211	2017,74	0,07	0,00
Grasslands	231	195,32	0,00	0,00
Complex crops	242	375,61	0,00	0,00
Mainly agricultural land with significant natural vegetation	243	9953,34	128,00	1,29
Broad-leaved forest	311	23385,16	1499,16	6,41
Coniferous forest	312	5979,31	858,41	14,36
Mixed forest	313	7500,65	0,25	0,00
Natural pastures	321	6899,77	929,57	13,47
Sclerophyllous vegetation	323	25091,73	593,49	2,37
Transitional wooded and bushy areas	324	2316,57	224,40	9,69
Beaches, dunes, sandy beaches	331	56,16	0,00	0,00
Areas of sparse vegetation	333	2407,04	381,47	15,85

Figure 4: Graph showing the percentage of area that may be affected by disturbance (% of each habitat in the synergistic impact study area (best case scenario).



However, according to Table 29 above, and the percentages calculated therein, in case that out of the total number of WPPs under licensing (licensing stage under installation and under production), only the project under study (best case scenario), in synergy with the existing WPPs, is licensed, the estimated habitat losses due to displacement in relation to the total available suitable habitat within the whole protected area, where a reduction in the activity of the species of interest by half (50%) is expected, are negligible and concern, in descending order, the following habitats: Industrial and commercial zones, areas with sparse vegetation, coniferous forest, natural pastures, transitional wooded and bushy areas, broad-leaved forest, sclerophyllous vegetation, mainly agricultural land with significant natural vegetation, non-irrigated arable land and mixed forest. The above habitats dominate, according to the land cover database and mapping (Corine land cover 2018) depicted on the relevant maps (see Map 7), covering in total more than 99% of the synergistic impact study area. Therefore, due to the fact that the study project is located within habitats that are abundant throughout (and outside of) the synergistic impact study area, due to the fact that the contribution of this project to cumulative/ synergistic impacts is minor (consisting of ten wind turbines), it is considered that this project would have a very minor impact on disturbance and displacement from important habitats for species of interest in the study area and the region more generally.

According to the above percentages of areas where a reduction in the activity of avifauna species is expected, the activity of each species recorded through the field survey and their sensitivity to disturbance and displacement phenomena, the species that are expected to face minor impacts on the populations operating within the study area, in the event that all of the licensed WPPs are licensed and installed, are large birds of prey-scavengers, as well as other large-sized species.

Considering all the information above, it is concluded that the installation and operation of the project under study will not have significant synergistic effects with the existing ones in the wider area. Furthermore, in the theoretical case of the worst-case scenario of the installation of all the WPPs to be authorized, although the synergistic effects are expected to be relatively high, the additive effect of the total of ten wind turbines of the project under study, based on the above analysis, is not expected to be of such magnitude as to adversely affect the protected objects of the protected areas concerned, their conservation status, their conservation objectives, etc., given that, in the above direction, the totality of the proposals, mitigation measures of the potential impacts referred to below would help. The potential impacts of the construction and operation of the Project under consideration are analyzed below.

Analysis of records of important bird species (species listed in Table 30)-Collision risk assessment

Table 30 below records, for the important raptor and other large species observed in the area, the number of transits, the number of transits per hour of raptor (and other large bird) sightings, and the number of recorded movements per impact zone A, B and C and the number of movements in the direct impact zone. The time spent observing raptors shall be the time during which field observers were at the observation positions at the raptor point observation stations from monitoring sites.

Although some records of large raptors were made at both the passeriform point recording stations and the linear cross sections with passeriform wetting, the above time of making these (passeriform) records was not included in the estimation of individual passages per hour of raptor observation. This stricter selection was made by the study team to avoid counting all time spent observing stratiform as predator observation time. As this was not a time when observers had a wide field of view and were concentrating their attention on observing predators, there was a variable degree of effectiveness in recording predators. Therefore, despite the fact that the raptor records made from these points - routes were recorded and included in the table below, they were considered as random (not random passages of raptors, but random observation) and the total observation time was not counted, but the net raptor observation time was calculated, which involved the presence of observers for the recording of raptors at the locations of the observation points, referred to as the raptor observation time. The result of this more rigorous approach by the study team is that a higher number of raptor crossings of individuals per raptor observation hour occurs, i.e. an overestimation of the above indicator, which was considered preferable to any underestimation of it (if the recording time of other bird species was included as recording time), in this ecologically important area for raptors.

The total minutes of raptor observation during the field recordings, based on the above, was 9,720 (or 162 hours). Three proximity zones related to the project under study were defined based on the turbine installation sites. Zone A covers 250 m on either side of the project development axis and within this area raptors may be negatively affected by the project because there is an increased potential for disturbance and impact. Zone B, which starts at 250 meters and extends up to 1,000 meters from the project development axis, with birdlife being less affected within this zone than in Zone A. Zone C, which starts at 1,000 meters and extends up to 2. 000 meters from the project development axis, which in terms of risk and disturbance rating is even milder than Zone B but is nevertheless assessed for large birds or birds of prey as their territories are large and may be affected by the project theoretically within it. The Zone of Direct Effect was defined as the zone within a radius of 100 meters from the installation site of each turbine, at a height of 30 to 150 meters, which is the height at which the blades of the turbines rotate and is considered the zone of highest risk of impact for birds of prey.

To estimate the magnitude of the mortality levels that may occur, the Band model (collision risk model, Band et al. 2007, Band 2012) is applied to provide an estimate of the annual mortality of the important predator species of the WPP. Scottish Natural Heritage reports a methodology for the overall estimate of the number of theoretical collisions that would be observed, but without since birds actively avoid wind turbines The combination of the above assessmentwith a theoretical avoidance rate, yields an estimate of the theoretical collisions. Thus, in a first step, a theoretical collission risk is estimated considering the technical characteristics of the turbines (number of blades, rotor diameter and period), the size (blade length and span) and the speed (average minimum and maximum, if available) of the species under consideration. The collision risk refers to the probability of a particular species impacting when it passes, without any avoidance effort, through the surface of the rotor. The number of passes of the species through the virtual rotor surface is then calculated, and extrapolated to a one-year period, based on the data collected from the field (field records). Since it is not feasible to record field passes from the exact virtual rotor surface, the number of passes from the virtual vertical surface of the WPP (risk window) is used and extrapolated to the total surface area defined by the rotors (in the one-dimensional version of the model which is simply passes perpendicular to the axis of the WPP). Thus, we essentially have an estimate of the number of passes from the rotor surface per year. Finally, by combining the above with a theoretical avoidance rate we finally obtain the number of impacts we expect to have.

Explanation of data used to estimate impacts:

A) Collision risk:

For some of the species to be analyzed, the model option of simply passing people through the risk window (not using the area extensively, e.g. feeding, etc.) was considered, on the basis of their flight frequency and behavior, to best simulate the observed flights and behavior of the specific species recorded in the area (short-toed eagle, booted eagle, European honey buzzard). However, for the assessment of the collision risk of the Cinereous Vulture and the Griffon Vulture, the version of the model that considers the volume of the area in which the species operate (in three dimensions) was applied in this study, as these species appear to make extensive use of the wider study area. The above calculation is based on the technical characteristics of the wind turbines (number of blades, rotor diameter and period) and the size (length, wingspan) and speed of the bird. For the technical characteristics, we considered the data from the model of the wind turbines to be used in the WPP. For the size of the bird, we used data from the guide to birds of Greece (Mullarney et al. 2007), while for an indicative value of the speed of each species we referred to other similar studies carried out in the area or other literature sources. The risk estimate (F) was calculated using the Excel spreadsheet provided on the Scottish Natural Heritage website (https://www.nature.scot/wind-farm-impacts-birds-calculating-probability-collision).

B) Number of passes by rotors per year

The calculation of the number of passes by the rotors per year was based on the data collected from the field records. Specifically, based on the flight maps of the species, the number of individuals observed from the surface of the risk window (Aw, width equal to that of the WPP and height equal to the maximum height covered by the passes Hmax = wing length + tower height) was considered. The number of all passages intersecting the axis connecting the turbines at the surface of the risk window was considered.

Thus:

$Aw\ (m^2) = W \times H_{max}$

Similarly, the area covered by the rotors (AR) is calculated based on the number of rotors (N) and the area covered by the rotors:

$AR\ (m^2) = N \times \Pi R^2$

Where:

R is the blade length

Based on the number of observed passes through the risk window, a reduction to a period of one year was made (considering the period within the year when the species is active, i.e., 12h/day, and the corresponding months in the area of presence in the area).

Specifically, the following variables were used.

K= number of passes observed

L= total hours of raptor observation in the WPP

M= number of months the species is present in the area

S= number of hours per year that the species is present in the area = M x 30 x 12

Finally, the expected number of passes of Aw per year P is P= (C x S) / L

Based on the above, the expected number of passes from the surface of the rotor per year is T=P x (AR/AW)

C) Number of collisions per year and avoidance

The expected number of collisions (without avoidance) per year is calculated from the number of passages per year T and the collision risk: C= T x F

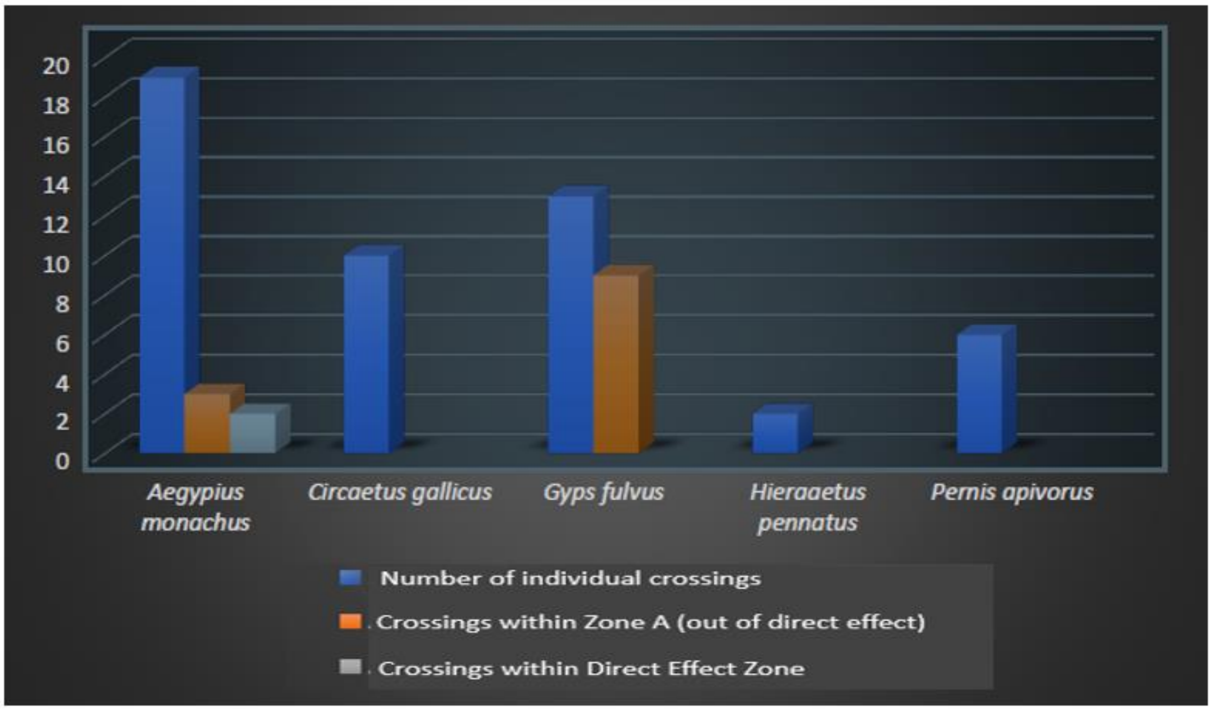
The above estimated number was adjusted based on an internationally accepted avoidance rate value of 98% (Eichhorn et al. 2012, Vasilakis et al. 2016) to obtain the final estimate.

Table 30. *Data from the flight analysis of important predators in the area*

Species	Number of individual crossings	Individual crossings per hour of predator observation	Crossings within zone A (out of direct effect zone)	Crossings within Zone B	Crossings within Zone C	**Crossings within Direct Effect Zone**
*Aegypius monachus**	19	0,117283950	3	2	4	2
*Circaetus gallicus**	10	0,061728395		3		
Gyps fulvus	13	0,080246913	9	2		
*Hieraaetus pennatus**	2	0,012345679			1	
Pernis apivorus	6	0,037037037		4	2	

** Eight individual crossing of Aegypius monachus, seven individual crossings of Circaetus gallicus, two individual crossings of Gyps fulvus and the sole individual crossing of Hieraaetus pennatus, took place outside the project's wind turbines' impact zones (distance greater than 2 km from the location of the nearest wind turbine of the project)*

Graph 1: *Total number of movements of significant predators and movements in zone A and in the zone of direct effect of the WPP.*



Cinereus Vulture (*Aegypius monachus*)

As mentioned in the previous chapter, the species was recorded 13 times (a total of 19 individuals) in the study area during the observations in July 2020, August 2020, September 2020, October 2020, April 2021 and June 2021, with six of the total records involving the crossing of two individuals per flight/recording. Of these six recordings, which involved the passage of two persons per flight, one took place within the Direct Impact Zone (distance of less than 100 m from the location of the nearest wind turbine of the wind power plant under study, but with a flight altitude of more than 30 m and less than 150 m), one flight was made within Zone A (distance of less than 250 metres from the location of the nearest wind turbine of the wind farm under study) and even at a distance of less than 100 metres from the location of the nearest wind turbine of the project, but with a very high flight altitude (greater than 300 metres) and for this reason this flight was not classified as a direct impact zone, one flight took place within Zone B (distance between 250 and 1. 000 metres from the location of the nearest wind turbine of the wind farm under study), one took place within Zone C (distance between 1,000 and 2,000 metres from the location of the nearest wind turbine of the wind farm under study), while the remaining two recordings were made outside the impact zones with the wind turbines of the project (distance greater than 2 km from the installation site of the nearest wind turbine). wind turbine of the wind farm under study). Finally, of the remaining seven individual recordings (one person crossing per flight/recording), one took place within Zone A, two within Zone C and four outside the impact zones of the project wind turbines (distance greater than 2 km).

The main characteristics of the species, as well as the pressures and threats affecting it, have been reported in Section 5 (Species of Interest), in the relevant subsection where required.

The activity of the species and the intensity of crossings per hour of observation (and even with the strictest estimate of this, which refers only to the hours of raptor recording) in the overall field study area of the WPP was low (0.12 crossings per hour) and is within the range of values of corresponding measurements at other viewpoints and WPPs in the Thrace region (Carcamo et al. 2011), which range from approximately 0.07 to 0.44 crossings per hour. The comparison is indicative as the above range of values refers to installed WPPs, which may bias the measurements due to higher disturbance, and therefore the activity of the species in these areas may have been even higher than twice the reported value.

The collision risk for the Cinereous Vulture, for flight speeds from 5.45 m/sec to 15.4 m/sec, ranges between 10.4% and 28.0%, while the expected rotor surface passes per year are 12,146 passes/year. Therefore, the expected collisions (without avoidance) are from 0.503 to 1.353 collisions per year. Correcting the above expected non-avoidance impacts by the 98% avoidance rate, the final estimate for impacts of this species per year is from 0.010 to 0.027 impacts per year. At this point it is worth noting that the study team used the most stringent criteria to derive the above results, namely that all recorded flights of the species involved site use and not simply passing through the site. The rigorous way of evaluating impact estimates described above, although it does increase the final estimate of collisions of this species per year, it was felt by the study team that it is more appropriate to use and the results in this way, because of the ecological importance of the study area, i.e. preferring to have a overestimation of values, but in no case underestimation.

The following is a visualization of the activity of the species using Kernal density algorithms based on the total number of recordings made in the field survey area (darker shading indicates more intense activity), without separating out flights of very high altitude or flights made at a farther distance from the wind turbines to be installed.

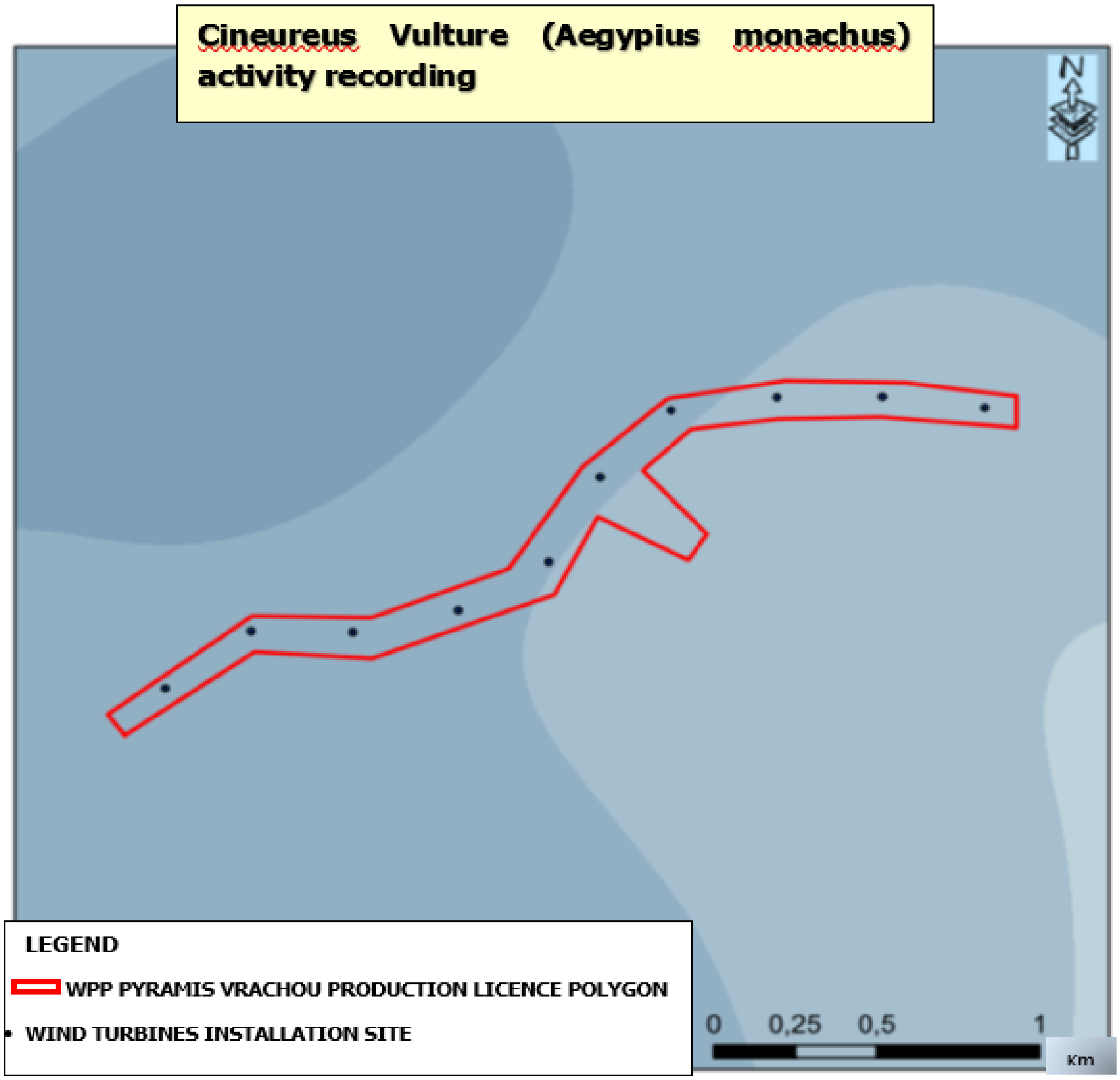


Figure 2: *Visualization of species activity using Kernal density algorithms based on records made in the field research area (darker shading indicates more intense activity).*

Short-toed Eagle (*Circaetus galicus*)

As mentioned in the previous section, the species was recorded seven times (a total of ten individuals) in the study area during the observations in July 2020, August 2020, September 2020, April 2021 and May 2021 with three of these records involving transit of two individuals per flight/recording and taking place, one within the Zone B , while the other two outside the impact zones of the WPP (distance greater than 2 km from the location of the nearest wind turbine of the project). Also, from the remaining four single recordings (one individual crossing per flight/recording), one took place within Zone B, the second was carried out within Zone B and the remaining three took place outside the impact zones with the Wind Power Plant (distance greater than 2 km).

The main characteristics of the species, as well as the pressures and threats affecting it, have been reported in Section 5 (Species of Interest), in the relevant subsection where required.

The activity of the species and the intensity of crossings per hour of observation (and even with the strictest estimate of that which refers only to the hours of raptor recording) in the overall field survey area of the WPP was low (0.062 crossings per hour) and is within the range of values reported at other viewpoints and WPPs (in the Thrace area according to Carcamo et al. 2011 considering combined data from Tables 7 and 37 of this study) which are from about 0 to 0.12 crossings per hour and average close to 0.051. However, as mentioned in the analysis of the species, the comparison is indicative as the above range of values refers to installed WPPs, which may cause a bias in the measurements due to higher disturbance and therefore in those areas the activity of the species may have been even higher.

The following is a visualization of the activity of the species using Kernal density algorithms based on the total number of records made in the field survey area (darker shading indicates more intense activity), without separating out flights of very high altitude or flights made at a farther distance from the wind turbines to be installed. It is not possible to show the calculation of collisions per year based on the SNH (Scottish Natural Heritage) methodology as the number of observed passes through the risk window is zero and hence the probability of the species colliding with the wind turbines.

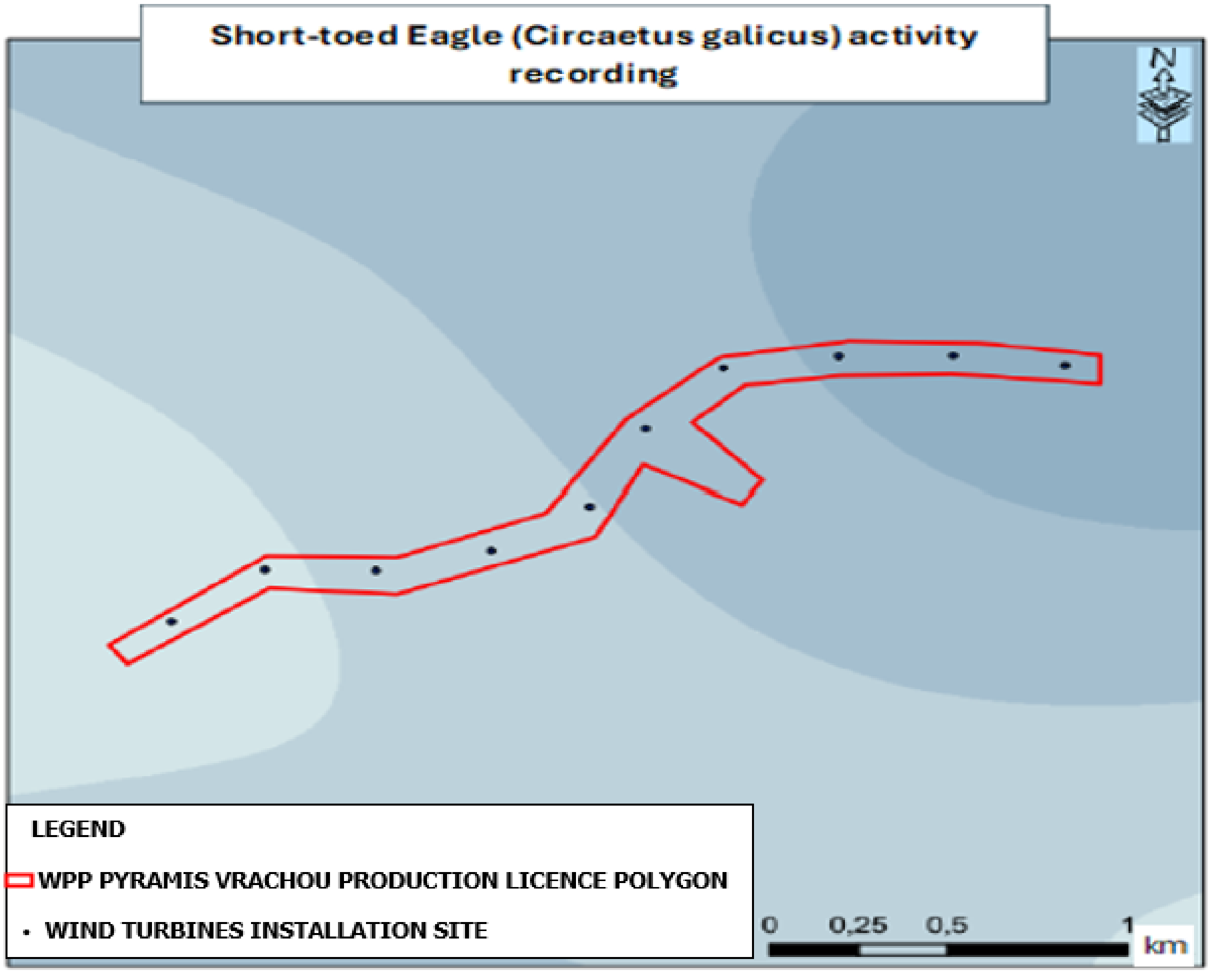


Figure 3: *Visualization of species activity using Kernal density algorithms based on records made in the field research area (darker shading indicates more intense activity).*

Booted Eagle (Hieraaetus pennatus)

As mentioned in a previous section, the species was recorded twice (two individuals) in the study area during the observations in June 2021. One individual of the species was recorded inside Zone C, while the second was recorded outside the impact zones with the (distance greater than 2 km from the installation site of the nearest wind turbine of the project under study).

The main characteristics of the species, as well as the pressures and threats affecting it, have been reported in Section 5 (Species of Interest), in the relevant subsection where required.

The activity of the species and the intensity of crossings per hour of observation (and even with the strictest estimate, which refers only to the hours of raptor recording) in the overall field study area of the WPP was low (0.012 crossings per hour) and within the range of values reported at other sighting sites and WPPs in the Thrace region (Carcamo et al. 2011, considering combined data from Tables 7 and 37 of this study), which are approximately between 0 and 0.038 crossings per hour. However, as mentioned in the analysis of the previous species, the comparison is indicative as the above range of values refers to installed WPPs, which may bias the measurements due to higher disturbance and therefore the activity of the species may have been even higher in these areas.

Listed below, the only element that can be presented for the species is the flight record of the species, since it is not possible to present an account of the activity using the Kernal Density algorithms (more than two records are required), nor a calculation of collisions per year based on the SNH (Scottish Natural Heritage) methodology, since the number of observed passes through the risk window is zero, and therefore the probability of the number of passes through the risk window being hit by the turbines is zero.

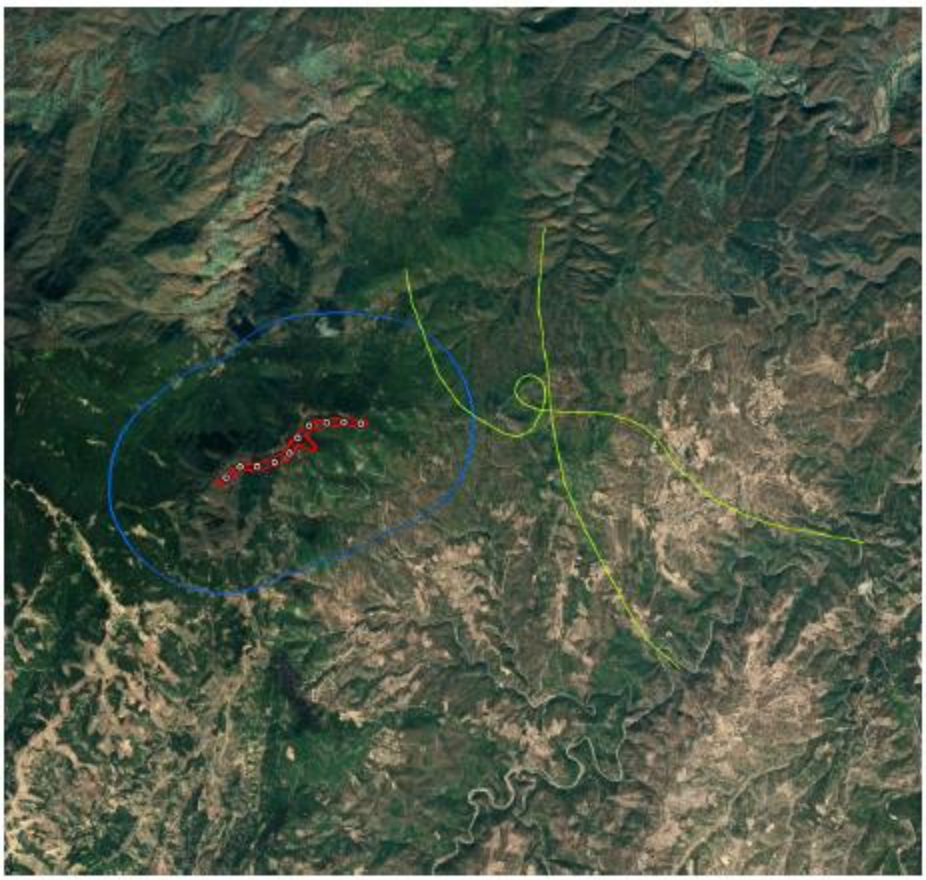


Figure 4: *Visualization of species activity using Kernal density algorithms based on records made in the field research area.*

European Honey Buzzard (Pernis apivorus)

As mentioned in a previous section, the species was recorded twice (a total of six individuals) in the study area during the August 2020 observations, with one of these records involving the passage of four individuals and taking place in Zone B, and the second record involving the passage of two individuals taking place in Zone C.

The main characteristics of the species, as well as the pressures and threats affecting it, have been reported in Section 5 (Species of Interest), in the relevant subsection where required.

Species activity and intensity of transits per hour (and even with the strictest estimate of this for only the hours of raptor recording) was very low across the entire WPP field study area (0.037 transits per hour).

Listed below, the only element that can be presented for the species is the flight record of the species, as it is not possible to present an account of the activity using the Kernal Density algorithms (more than two records are required) and also a calculation of the number of records of collisions per year based on SNH (Scottish Natural Heritage) methodology, since the number of observed passes through the risk window is zero, and therefore the probability of the number of passes through the risk window being hit by the turbines is zero.

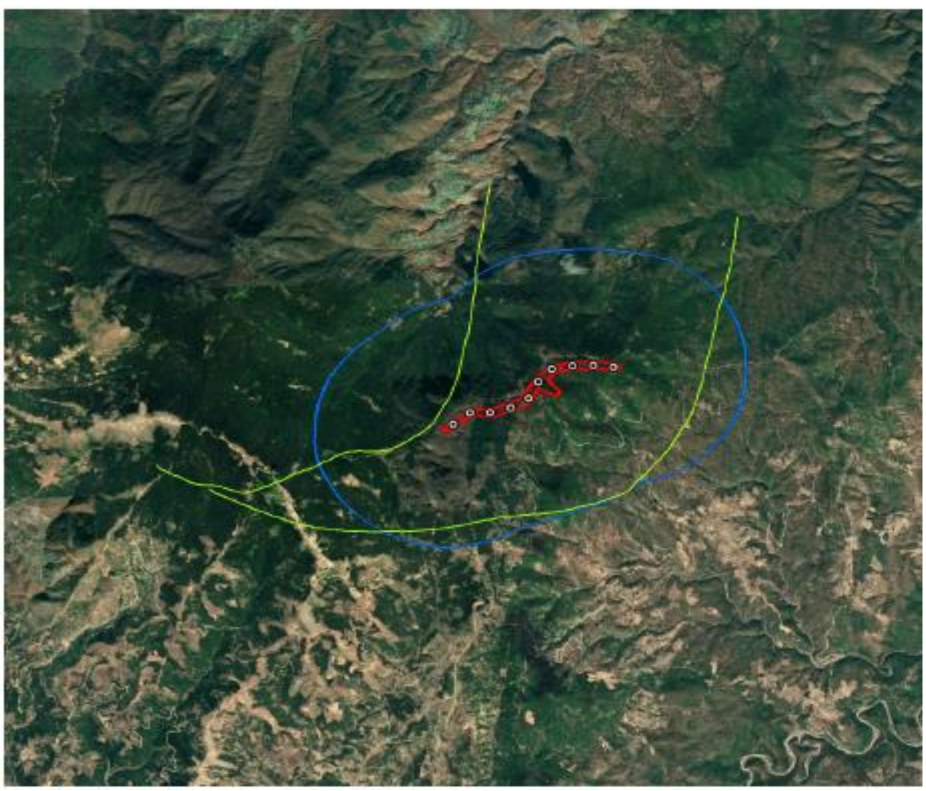


Figure 5: *Illustration of species activity based on records made in the field survey area.*

Griffon Vulture (Gyps fulvus)

As mentioned in the previous section, the species was recorded six times (13 individuals in total) in the study area during the observations in August 2020, September 2020, October 2020 and March 2021, with one of these records involving the passage of seven individuals and taking place within Zone A and in fact at a distance of less than 100 metres from the location of the nearest wind turbine of the project, but with a high flight altitude (greater than 250 metres) and therefore this flight was not classified in the Direct Impact Zone. Also, due to the of the total number of recordings, one was a two-person crossing and took place within Zone A and at a distance of less than 100 metres from the installation site of the nearest wind turbine of the project, but with a very high flight altitude (approximately 500 metres). Finally, of the remaining four single recordings (one individual crossing per flight/recording), two were carried out within Zone B and two were carried out outside the impact zones with the project wind turbines (distance greater than 2 km from the location of the nearest wind turbine of the wind farm under study).

The main characteristics of the species, as well as the pressures and threats to it, are have been reported in section 5 (species of interest), in relevant subsection required.

The activity of the species and the intensity of crossings per hour (and even with the strictest estimation of this for the hours of raptor recording only) were low throughout the WPP field study area (0.08 crossings per hour) and within the range of values of corresponding measurements at other viewpoints and WPPs in the Thrace area (Carcamo et al. 2011, taking into account the combined data of Tables 7 and 37 of this study), which are approximately between 0.08 and 0.69 crossings per hour, with the value being less than half of the maximum reported above for the other areas. The comparison is indicative as the above range of values refers to installed WPPs, which may bias the measurements due to greater disturbance, and therefore the activity of the species in these areas was even higher than the recorded value.

Below, the visualisation of species activity using kernel density algorithms is presented based on the total number of records made in the field survey area (darker shading indicates more intense activity), without separating very high altitude flights or flights at a greater distance from the wind turbines to be installed. It is not possible to show the calculation of collisions per year based on the SNH (Scottish Natural Heritage) methodology as the number of observed passes through the risk window is zero and therefore the probability of the species colliding with the wind turbines is zero.

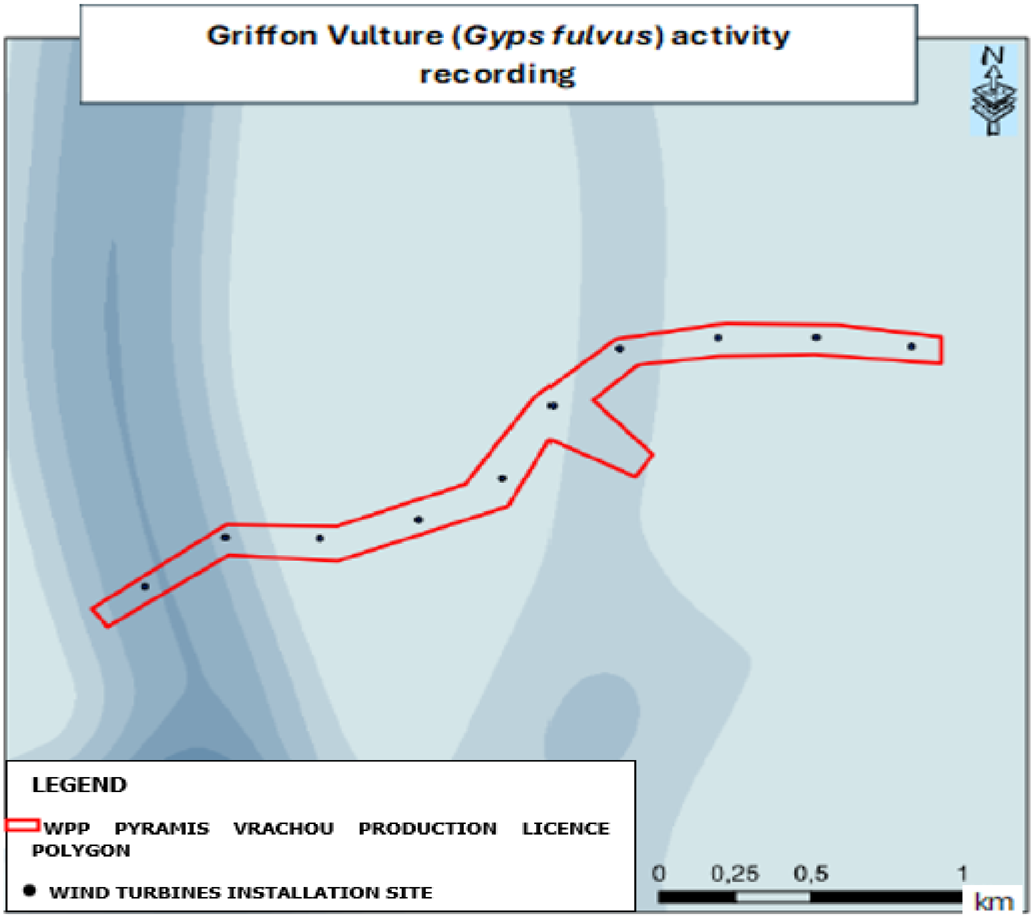


Figure 6: *Visualization of species activity using Kernal density algorithms based on records made in the field research area (darker shading indicates more intense activity).*

Red-backed Shrike (Lanius collurio)

As mentioned in a previous section, the species was recorded four times (five individuals in total) in the study area during the observations in August 2020, September 2020 and June 2021.

The main characteristics of the species, as well as the pressures and threats affecting it, have been reported in Section 5 (Species of Interest), in the relevant subsection where required.

Of all the threats listed above, the installation of the proposed WPP will not have a serious impact on the species. No increased concentrations of the species have been observed. Based on the above, and the fact that the species is directly associated with vegetation and soil and flies at relatively low altitudes, the significance of the impact on the species from the installation of the WPP is considered to be negligible.

The following is a visualisation of the activity of the species using Kernal density algorithms based on the set of recordings that were made in the field survey area (darker shading indicates more intense activity).

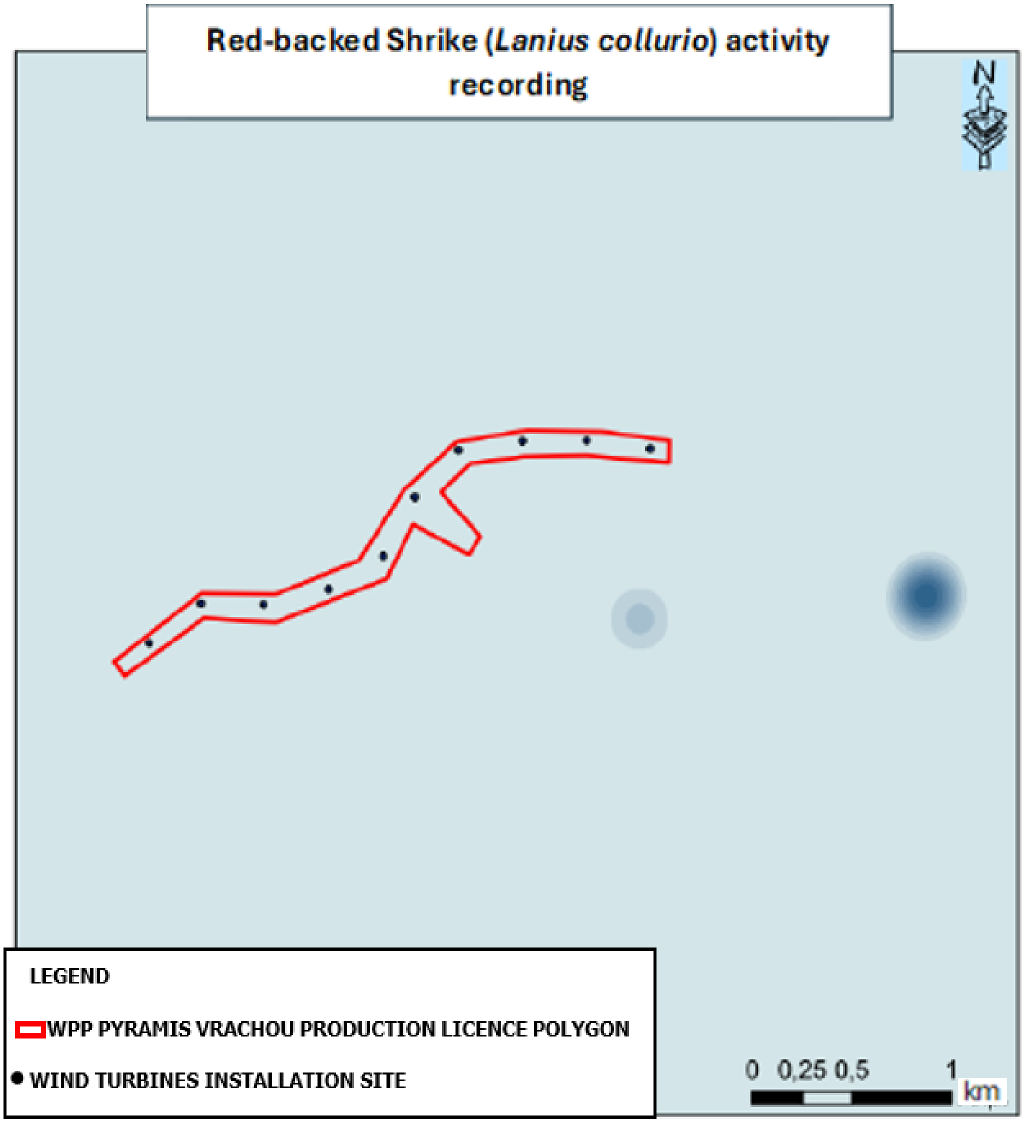


Figure 1: *Visualization of species activity using Kernal density algorithms based on records made in the field research area (darker shading indicates more intense activity).*

Woodlark (Lullula arborea)

As mentioned in a previous section the species was recorded five times (9 individuals in total) in the study area, during the observations in February 2021, April 2021 and June 2021 with the species being observed within the open grasslands of the study area.

The species breeds in most European countries, particularly in Spain, Romania, Poland, Turkey and Portugal.

The European population of the species is estimated at 2,140,000 – 4,570,000 pairs (4,290,000 – 9,130,000 mature individuals), while in the EU28 it is estimated at 1,760,000 – 3,180,000 (3,530,000 – 6,360,000 mature individuals). In Europe, the population of the species is estimated to have declined by more than 4% in the last decade. The Greek population is estimated at 5,000-20,000 pairs, representing <1% of the European population (BirdLife International 2021).

The species is widespread in the Greek mainland while there have been sightings on a number of islands.

The species is protected by Directive 2009/147/EC (Annex I) and the Bern Convention (Annex III). According to the Red Book of the Threatened Animals Of Greece and IUCN at a European level, the species is not classified as Least Concern (LC) (BirdLife International 2021). It is also classified by BirdLife International as a SPEC 2 species of European interest in terms of protection (BirdLife International 2017).

The species inhabits a variety of open habitats in well-drained soils, with a preference for acidic sandy soils of low intensity or abandoned arable land (fallow land), scrubland, orchards, steppe orchards and forest edges. It breeds in open rocky areas, open forests, scrubland with scattered clumps of trees, etc. (in the mountains and semi-mountains), while in winter it is also observed at lower altitudes. The woodlark is a monogamous species and breeds from March to July. The nest is built in the ground and usually protected by bushes or stumps and lined with leaves, pine needles and moss. It usually lays three to five eggs (Donald 2004). Insectivorous, often feeding on the ground where it nests. Often chirps from rocks, trees or isolated bushes. Migratory in the northern part of its range and in central Europe and Russia. It is endemic in western Europe and the Mediterranean (Snow and Perrins 1998).

Threats listed in the IUCN Red List include loss and degradation of habitat due to agricultural intensification or deforestation due to abandonment of extensive livestock production (Tucker and Heath 1994). In addition, extreme winter weather conditions can cause significant population declines (Donald 2004).

The recommended conservation actions, according to the IUCN, are as follows:

- Promotion and continuation of extensive livestock production and protection of the species' habitats
- Management of new plantations (Tucker and Heath 1994).

Of all the threats listed above, the installation of the proposed WPP is not expected to have a serious impact on the species. Based on the above and the fact that the species is directly associated with vegetation and soil and flies at relatively low altitudes, the significance of the impact of the installation of the WPP on the species is considered to be negligible.

The illustration of the activity of the species is presented below using Kernal density algorithms based on the set of records that were conducted in the field survey area (darker shading indicates more pronounced activity).

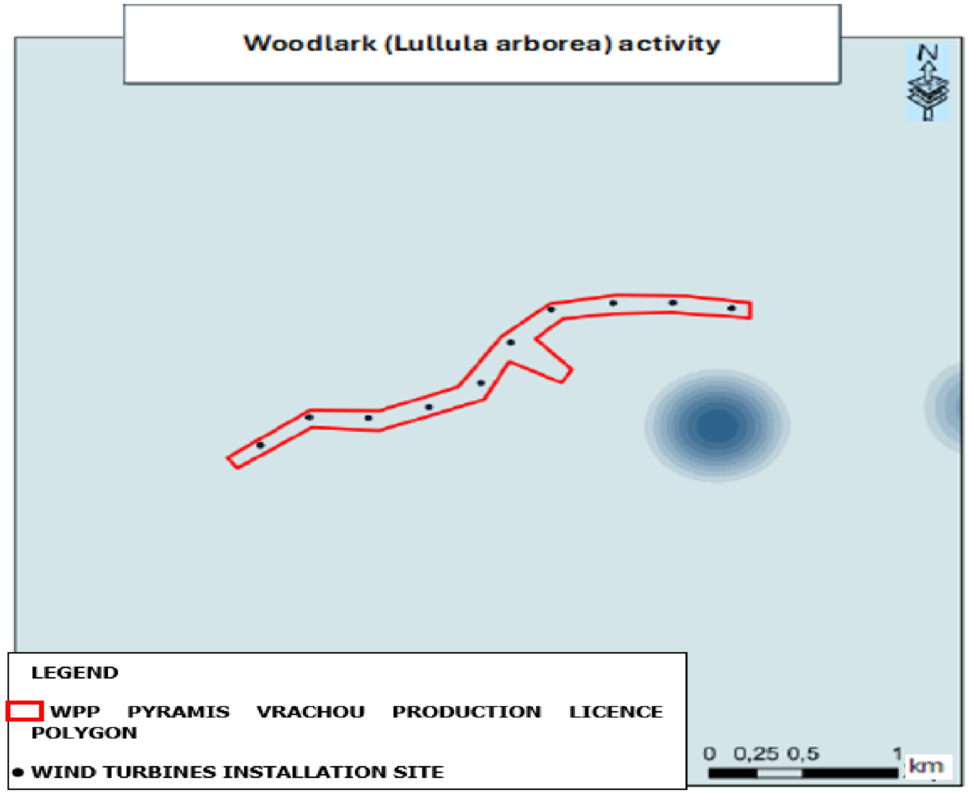


Figure 2: *Visualization of species activity using Kernal density algorithms based on records made in the field research area (darker shading indicates more intense activity).*

Sardinian Warbler (Curruca melanocephala)

As mentioned in a previous section, the species was recorded once (one individual) in the study area during the observations in May 2021.

The main characteristics of the species, as well as the pressures and threats affecting it, have been reported in Section 5 (Species of Interest), in the relevant subsection where required.

Of all the threats listed above, the installation of the proposed WPP will not have a serious impact on the species. No increased concentrations of the species have been observed. Based on the above, and the fact that the species is directly associated with vegetation and soil and flies at relatively low altitudes, the significance of the impact on the species from the installation of the WPP is considered to be negligible.

It is not possible for the activity of the species to be presented using Kernal density algorithms (due to single recording).

Black Woodpecker (Dryocopus martius)

As mentioned in a previous section, the species was recorded twice (two individuals) in the study area during observations in November 2020 and June 2021.

In Europe, the breeding population is estimated at 622,000 - 1,140,000 pairs (1,240,000 - 2,270,000 mature individuals), while in the EU28, according to the IUCN Red List, the population is estimated at 208,000 - 254,000 pairs (416,000 - 707,000 mature individuals). The Greek population of the species is estimated at 1,000-2,000 pairs, representing less than 1% of the European population. (BirdLife International 2021).

In Europe, the species breeds mainly in Russia (61% of the European population), with smaller populations in most other countries.

The species is protected by Directive 2009/147/EC (Annex I) and the (Annex II). According to the Red Book of the Threatened Animals of Greece and the IUCN at a European level, the species is not classified as threatened and is listed as a species of Least Concern (LC) (BirdLife International 2021). It is also not listed in any European species category of European interest in terms of protection by Birdlife International.

The species is found at higher altitudes in the forests of northern and central Greece, in small populations. It also breeds in Cephalonia, where it is the only island population of the species in the Mediterranean (Handrinos and Akriotis 1997).

It is found from sea level up to 2000 m and is easily adaptable in terms of the dominant forest species of the stands in which it lives, which vary (conifers, beech, willow, poplaretc.) (Gorman 2004). Its adaptability, regarding species, composition and age of the dominant forest species is thought to be the main reason for its population stability despite changes in forest ecosystems caused by anthropogenic interventions, unlike other woodpeckers (Rolstad et al. 2002b). At 45-47 cm, it is the largest European woodpecker and therefore requires large trees for nesting. It is not exclusively dependent on naturally mature forests and is quite tolerant of a low diversity of forest species (Angelstam 1990). This is one of the reasons why it is colonising areas where it was previously absent (Spitznagel 1990). It can live in managed pure coniferous forests (Nilsson et al. 1992). It spawns from mid-March to mid-May and usually lays 3-5 eggs. It is an insectivorous species and feeds mainly on ants, which in some areas make up 97% of its diet during the summer. Plant food is a very small part of its diet (Rolstad et al. 1998). It is thought that the distribution of wood-eating ants has a corresponding effect on its distribution, which is the main reason for its absence from Britain (Kear 2003).Some ant species colonise the stumps of fallen trees after logging, often attracting individuals of the same species (Rolstad et al. 1998). It is not particularly affected by adverse winter weather conditions, and only when snow cover exceeds 100 cm does it forage for ants and beetles living on tree trunks, or leaves its winter habitat during the winter months if there are none. It is the most widespread of all woodpecker species after the great spotted woodpecker, but is absent from some countries in southern Europe. It is the only European woodpecker to have increased its range in recent years (Gorman 2004).

According to the list of threats to the species (Dimalexis 2009), the reported threats to the species are:

- Inappropriate forest management
- Deforestation and logging
- Changes in habitat extent and distribution due to climate change.

The threats listed in the IUCN Red List are inappropriate forest management and deforestation (Garmendia et al. 2006, Zhelezov 2010).

The recommended conservation actions, according to the IUCN, are as follows:

- Establishment of monitoring to ensure that logging and forest management do not pose a serious threat.

Of all the threats that have been listed, the installation of the proposed WPP is not expected to have a serious impact on the species. No increased concentrations of the species have been observed. Based on the above and the fact that the species is directly associated with vegetation and soil and flies at a relatively low altitude, the significance of the impact on the species from the installation of the WPP is considered to be negligible.

It is not possible for the activity of the species to be presented using Kernal density algorithms (due to the single recording).

Middle spotted woodpecker (Leiopicus medius)

As mentioned in a previous section, the species was recorded once (one individual) in the study area during the observations in August 2020.

The main characteristics of the species, as well as the pressures and threats affecting it, have been reported in Section 5 (Species of Interest), in the relevant subsection where required.

Of all the threats that have been listed, the installation of the proposed WPP will not have a serious impact on the species. No increased concentrations of the species have been observed. Based on the above, and the fact that the species is directly associated with vegetation and soil and flies at relatively low altitudes, the significance of the impact on the species from the installation of the WPP is considered to be negligible.

It is not possible for the activity of the species to be presented using Kernal density algorithms (due to single recording).

Tawny Owl (Strix aluco)

As mentioned in the previous section, the species was recorded twice (two individuals) in the study area during the observations in October 2020 and November 2020.

The main characteristics of the species, as well as the pressures and threats affecting it, have been reported in Section 5 (Species of Interest), in the relevant subsection where required.

Regarding the IUCN's documented threat to power lines, it is noted that for the currently planned park, the installation of an underground power transmission network is proposed by this power supply. Based on all of the above information, the installation of the WPP studied is not expected to have a significant impact on the species. No increased concentrations of the species were observed (as mentioned above, the species was only observed twice during the entire observation period). Based on the above and the fact that the species is directly associated with vegetation and the ground and flies at relatively low altitudes, the significance of the impact on the species from the installation of the WPP is considered negligible.

It is not possible for the activity of the species to be presented using Kernal density algorithms (more than two records are required).

Green Woodpecker (Picus viridis)

As mentioned in a previous section, the species was recorded once (one individual) in the study area during the observations in December 2020.

The main characteristics of the species, as well as the pressures and threats affecting it, have been reported in Section 5 (Species of Interest), in the relevant subsection where required.

Of all the threats that have been listed, the installation of the proposed WPP will not have a serious impact on the species. No increased concentrations of the species have been observed. Based on the above, and the fact that the species is directly associated with vegetation and soil and flies at relatively low altitudes, the significance of the impact on the species from the installation of the WPP is considered to be negligible.

It is not possible for the activity of the species to be presented using Kernal density algorithms (due to the single record).

It is not possible to show the activity of the species using kernel density algorithms (due to the single record).

In summary, no active nest of any of the above species has been detected in the vicinity of the project site, nor has the presence of a nest in the field survey area been detected through their movements, and therefore there is no need to designate nesting and foraging zones as required by No. 2 of Ministerial Decision 8353/276/E106.

α/α	SPECIES	COLLISIONS PER YEAR
1	Cinereous Vulture (Aegypius monachus)	0,025 to 0,068
2	Short toed Snake Eagle (Circaetus gallicus)	0
3	Booted Eagle (Hieraaetus pennatus)	0
4	European honey buzzard (Pernis apivorus)	0
5	Griffon Vulture (Gyps fulvus)	0
6	Red backed Shrike (Lanius collurio)	0
7	Woodlark (Lullula arborea)	0
8	Sardinian warbler (Curruca melanocephala)	0
9	Black woodpecker (Dryocopus martius)	0
10	Middle spotted woodpecker (Leiopicus medius)	0
11	Tawny owl (Strix aluco)	0
12	European green woodpecker (Picus viridis)	0
13	Sardinian warbler (Curruca melanocephala)	0
14	Black woodpecker (Dryocopus martius)	0
15	Middle spotted woodpecker (Leiopicus medius)	0

Analysis of mammalian records

From the mammal records in the research area, the existence of common species of this fauna category has been documented. These species are observed in most parts of Greece, are present in satisfactory numbers (e.g., hare) or in very large numbers (e.g., fox) and, for this reason, none of them are priority species of the adjacent Natura 2000 sites and are not included in Annex II of Directive 92/43/EEC. A total of eight mammal species were found in the research area, of which only the wildcat is listed in Annex IV of the above Directive.

Analysis of reptile records

Although Greece is a small country, its geographical location, the wide variety of different habitats and the existence of more than 9,000 islands and islets have contributed to the recording of many reptile species compared to other European countries (Legakis and Marangou 2009). During the field research of the wider study area, six reptile species (three species of lizard, one species of snake and two species of turtle) were identified and recorded, of which two species of turtles, the gray turtle and the Mediterranean tortoise, belong to the species listed in Annex II of Directive 92/43/EEC (they are also listed in Annex IV of the Directive), the green and wall lizards are listed in Annex IV of the Directive, while the snake lizard and the snake are not listed in any of the above mentioned Annexes.

Analysis of amphibian records

Amphibians are important indicators of ecosystem status and occupy almost all habitat types in Greece (Valakos et al. 2008). Most amphibians exhibit both aquatic and terrestrial phases in their life cycle, so they are used to monitor changes in both terrestrial and aquatic ecosystems (Stebbins and Cohen 1995). As amphibians are highly dependent on environmental moisture, they are also indicators of large-scale environmental phenomena, such as global climate change (Beebee 1995, Stuart et al. 2004, Araujo et al. 2006, Wake 2007) (in: Legakis and Maragou 2009).

Many amphibians have life cycles that include movement from wintering grounds to breeding ponds or wetlands in spring, post-breeding dispersal and movement back to wintering grounds (juveniles and adults). Under these conditions, breeding adults are extremely vulnerable to accidents at least twice a year (to and from breeding and wintering sites), and yearling juveniles must also crossroads to wintering sites (Jackson 1996). In extreme conditions, mortality and dispersal effects can result in loss of genetic diversity when local populations depend on gene flow resulting from dispersal (Jackson and Griffin 1998; Reh and Seitz 1990).

One species of amphibian (Bufo viridis) was identified during the field research, which is not classified under a threatened status but is listed as a species of Least Concern (LC) on the IUCN red list and is not a species listed in Annex II of Directive 92/43/EOK (it is a species listed in Annex IV of the Directive).

General: Impact assessment

The development of renewable energy sources in recent years and wind energy has been of great concern to many scientists because of the potential impact it may have on the environment, on fauna and especially on birds. There have been many studies and research which have led the EU to issue guidelines and reports on this growing activity. The effects of a WPP are highly variable and depend largely on many factors such as the specificity of the site, the habitats found in it and the fauna species and, above all, their numbers in the specific habitats within and near the installation sites. It is obvious that dissimilar categories of fauna species are affected to varying degrees by such projects, ranging from high to zero impact. Many wildlife species are particularly sensitive and affected by human activities (Frid and Dill, 2002). Human presence in natural areas can lead to displacement of fauna species, forcing them to expend available energy to move to other parts of the habitat or to move to new habitats that are not as suitable.

The broader project area includes, among other things, habitats with obvious signs of overgrazing. The installation of a WPP involves the risk of increasing the human presence at the installation site. However, this impact is mainly limited during the implementation of the works, whereas afterwards, during the operational phase of the WPP, the human presence is negligible, and the area largely returns to its former character. In the case of the wind farm in question, the presence of the existing road network in the wider area is an important positive factor. As a result, the accessibility of the site will not be particularly affected by the installation of the WPP and will not be much greater than before its construction.

The biggest problems (where they arise) from the installation and operation of WPP projects have been identified in the avifauna and mainly in sensitive areas such as areas that for some reasons concentrate significant numbers of birds (wetlands, places of concentration or transit of migratory birds etc.) or areas that are habitats of rare and sensitive species, without overlooking the potential impacts on other fauna.

Studies and research to date have concluded that the main forms of impacts can be identified in four categories:

- **Disturbance**, which removes bird species from the WPP zone causing indirect habitat loss and is due to factors such as noise, visual disturbance, etc.
- **Collision**, which kills or injures people by direct contact with the turbine blades.
- **Barrier effect** to the movement of bird species.
- **Direct habitat loss or change in habitat structure** due to destruction or occupation of habitat used by the species prior to the construction of the wind turbine.

Assessment of impacts on key species

From the analysis of the field recordings presented above, it is judged that the construction and operation of this WPP, in theory, may have some impact on avifauna species that are sensitive to such structures and projects. To assess the impacts on birds, the following table has been prepared which presents the estimates of the sensitivity of avifauna to wind farms based on the EU guidelines and data (European Commission 2010). Also presented in the table is the assessment of this study based on observations and field records. The assessment is derived from the field data set and its analyses as presented in the section "Analysis of records of important species (species listed in Table

30) - Collision risk assessment". The table below lists species that are included in the EU Guide (European Commission 2010) and were observed during the fieldwork, as well as other species of interest in the area that were observed during this work by the study team and not included in the above-mentioned guide.

Table 31: Impact assessment on the avifauna recorded in the area, in relation to the EU classifications and data (European Commission 2010) for those of the above

Species	EU characterization			Estimation in the studied WPP		
	Habitat loss	Collision	Creation of barrier	Habitat loss	Collision	Creation of barrier
Aegypius monachus (Cinereous Vulture)	-	-	-	O	X X	O
Circaetus gallicus (Snake eagle)	X	XXX	X	O	O	O
Gyps fulvus (vulture)	X	XXX	X	O	X	O
Hieraaetus pennatus (Booted Eagle)	-	-	-	O	O	O
Pernis apivorus (European Honey Buzzard)			O	O	O	O
Dryocopus martius (Black woodpecker)	-	-	-		O	
Lanius collurio (Red backed Shrike)	-	-	-		O	
Lullula arborea (Woodlark)	-	-	-		O	
Leiopicus medius (Middle Spotted Woodpecker)	-	-	-		O	
Curruca melanocephala (Sardinian Warbler)	-	-	-		O	
Picus viridis (European Green Woodpecker)	-	-	-		O	
Strix aluco (Tawny Owl)	-	-	-		O	
Passeriformes		X	X	Recorded by case		

Legend: XXX = evidence of significant risk of impact, XX = evidence of risk of impact, X = possible risk of impact, O = low or no significant risk of impact, where there is a dash (-) the species is not mentioned in the EU Guide

The following conclusions are drawn from the above table:

Of the large predatory scavenging species observed in the field study area, the vulture appears to be theoretically at risk of impact from collision, as it appears to use the area of the WPP site. The recorded flights of the species and frequency of observations per hour of observation are detailed in the previous section. Based on the data obtained from the analysis of the field records, the above species has been classified as a 'potential impact risk' in terms of impact. The above classification was also made taking into account the importance of the wider area to the species, its use of the area (foraging), its size and the fact that the above species, like most large scavenging birds, is a K-selection species in terms of its evolutionary growth strategies. It would be more accurate to classify the above species in the milder category of "potential impact risk" in terms of impact, as the estimated impact rates per year were not very high, although they were calculated using the strictest possible criteria (assuming that all recorded flights were flights indicating use of the site and not accidental passage through the area). Only one record of two people passing through was a record of a 'dangerous flight' (Direct Impact Zone). The majority of the other recorded flights had an altitude of more than 300 m and more than 42% of the total number of individual passages of the species took place outside the impact zones with the wind farm (distance of more than 2 km from the installation site of the nearest wind turbine of the wind farm under study).

Regarding the vulture, although from the characteristics of its flights, from field recordings in the study area, the possibility of collision with the wind turbines of the considered wind farm did not emerge, the above possibility cannot be excluded due to its presence and the use of the site it carries out. Therefore, and while this is not evident from its flight characteristics, as mentioned above, the species was preferred to be classified in terms of impact impact in the risk category "potential risk of impact", given the importance of the wider area for the species, the use of the area (feeding), its size, and the fact that the above species, like most large scavenging birds, is a K - selection in terms of its evolutionary growth strategies.

In the case of the Short-toed eagle (as well as the griffon vulture), the probability of collision with the wind turbines of the project under study is zero, based on the field records (with only three individual crossings of the species occurring within Zone B, while the remaining seven were outside the Field Survey Area - i.e. outside the impact zones with the Wind Power Station). However, given the importance of the wider area for this species, the low but high importance of the presence of the species, their size, and the fact that both the the above species, like the black vulture and the vulture, are K - option species in terms of evolutionary growth strategies, we believe that there is always the possibility of collision risk.

This possibility is real, especially if they act in combination with the other factors that increase the risk to the region, even for a limited period of time. the activity of the above-mentioned species (the griffon vulture and the cinereus vulture in particular) in the field study area, such as the presence of a dead animal in the vicinity of the WPP installation area. For the above reason, and in order to minimise the already very low probability of risk to the above species from collision effects, additional measures are proposed in the following section to address the potential impacts, ***most importantly the requirement for the developer to install a fibre optic system to automatically stop the wind turbine in the event of the detection of a nearby species of interest, in order to limit the number of wind turbines in the area to minimise the possibility of collision.***

In the same category as the Short-toed Eagle, the other species are also classified important predators, such as the booted eagle, the European Honey Buzzard and the peregrine falcon. Their total individual crossings are very few. Despite the fact that the species above do not appear to be directly associated with the study area and the project area in particular, as mentioned above, this fact cannot exclude the possibility that these species make incidental passages through the project site, and therefore there is also a possibility that they may be subject to a certain degree of impact, which is, however, very unlikely, very small, and therefore these species were classified in the category 'low or no significant risk of collision'.

For the other important avifauna species of smaller size (passeriforms, piciformes, etc.), it is considered that there cannot be significant impacts as they are species that move short distances and, in addition, no large concentrations were recorded in the field survey area.

Regarding the impact of habitat loss for most of the 46 species of interest analysed in a previous section, it is not considered to be present for the WPP due to the very small area occupied by the project and the high coverage of the respective habitats both inside and outside the study area. However, regarding the species characterisation and delineation of the main study area SPA GR1110010, for which critical habitats for the study area have been presented (available on the website of the Ministry of Environment for 76 SPAs in the country - https://ypen.gov.gr/perivallon/viopoikilotita/diktyo-natura-2000/), it is noted that the critical habitats of one of the three designated species (since, according to the above source, there are no critical habitats for the designated species of the cinereus vulture, but only for the Lesser Spotted Eagle and the Egyptian vulture) are located outside the production license polygons of the project under study.
Regarding the critical habitats of the demarcation species Ciconia nigra and Hieraaetus pennatus, these are located outside the production license polygons, while for the demarcation species Circaetus gallicus and Aquila chrysaetos, the percentages of critical habitat area covered are negligible, amounting to 0,083 % for Aquila chrysaetos (total area of critical habitat Aquila chrysaetos: 51. 929,86 ha, area of critical habitat covered by the production license blocks of the project under study: 43,02 ha) and 0 ,084 % for Circaetus gallicus (total area of critical habitat for Circaetus gallicus: 47.082 ha, area of critical habitat covered by the production license polygons of the project under study: 39,75 ha).

Regarding the impact of the creation of barriers, the wind farm under study occupies a small area and therefore cannot cause a similar type of impact on the above species. Also, given the above proposal to install an automated wind turbine stopping system, the wind turbines to be installed will be stopped when birds of interest are passing through the area and the already minimal barrier area will be further reduced. **It should also be pointed out that this system can be set up to work without deterring birds but only by stopping the turbine, and the problems that may arise due to the topography can be overcome by the correct choice of camera placement angle, or by an additional number of cameras if necessary, in order to adequately cover the case of a bird coming from a lower altitude than the level of the cameras, due to the morphology of the terrain. Correct configuration of the camera parameters according to the area (correct choice of the angle of camera placement in order to adequately cover the case of a bird coming from a lower altitude than the camera level due to the morphology of the terrain, correct configuration according to the biometric characteristics of the species in the area, short response time from the detection of the species to the complete stop of the wind turbine, experimental period of operation of the system with control of its effectiveness by field observers) are necessary parameters to minimize the risk of collision for the above mentioned important species.**

During the present study, and during the field months that it was conducted (July 2020 - June 2021), no concentrations or significant group movements of migratory birds that could be affected by the presence of wind turbines were recorded, even though the wider study area is an important migratory corridor. Furthermore, even though methodological efforts were made to identify and record autumn and spring migration and possible movements during winter (night observations when the moon phase allowed), it was not possible to record them. At this point it is worth mentioning that this fact does not, of course, negate the presence of migration in the area. However, the topography of the area where the wind farm is to be installed and the morphology of the wider area does not create narrow passages that could guide the species in crossing the site of the wind farm in question. Therefore, it is estimated that, based on the field data presented here (and for the time in which they were conducted), no potential impacts on migratory species would occur. However, and despite this fact, the additional mitigation measures for potential impacts proposed in the next section also consider the location of the study area.

Mammals

Regarding the mammal species observed and recorded in the research area, it is considered that the construction and operation of the park cannot cause significant or permanent disturbance or adverse impact. Apart from the construction phase of the project and its accompanying roads (which will be limited in size due to the presence of the existing road network), where there will be temporary mobility and minor landscape reshaping, the wider area will be 'allocated' to fauna species for use without any particular change in its characteristics, taking into account the mitigation measures that will also be proposed for this fauna class in a subsequent section. The mammal species recorded are species that are highly adaptable to anthropogenic influences, and it is considered certain that their activity or vital habitat will not be disturbed or lost to the extent that their presence, the population they maintain in the area, or the integrity of their habitats will be affected. These species are found in most parts of Greece and are species with satisfactory (e.g., hare) or particularly large populations (e.g., fox) and for this reason none of them are priority species of the neighboring SACs of the Natura 2000 network and are not included in Annex II of Directive 92/43/EEC.

Amphibians

One amphibian species was found in the research area, which is not classified as a threatened species, but is listed as a species of least concern (LC) in the IUCN red list, while it is not a species of Annex II of Directive 92/43/EEC (it is a species of Annex IV of the Directive).

Reptiles

Six reptile species (three lizard species, one snake species and two turtle species) were identified and recorded in the study area, of which two turtle species, the Spur Thighed Tortoise, and the Mediterranean turtle, belong to the species listed in Annex II of Directive 92/43/EEC. The Mediterranean turtle (Testudo hermanni) is protected by Directive 92/43/EEC (Annex II and IV) and the Bern Convention (Annex II). It is also protected by the International CITES Convention (Annex II). According to the Greek Red Data Book in Greece, Testudo hermanni is classified as Vulnerable (VU), while according to the IUCN at European level the species is classified as Near Threatened (NT). The Spur Thighed Tortoise (Testudo graeca) is protected by Directive 92/43/EEC (Annex II and IV) and the Bern Convention (Annex II). It is also protected by the International Convention CITES (Annex II). According to the Greek Red Data Book in Greece, the species is not classified as threatened (LC: least concern), while according to IUCN at European level the species is classified as Vulnerable (VU).

Even the unlikely, accidental loss of individuals of the above species, which may occur during the installation and construction process of the WPP, will be negligible compared to the losses suffered by these species from other anthropogenic activities such as the traffic of cars on all the roads of the national network of the area and the entire area of their distribution. Moreover, the populations of these species are not likely to suffer any kind of disturbance because of such accidental loss. Furthermore, due primarily to the fact that the area of the project site is not expected to host significant populations of these species, and that the construction of the project site will primarily use the existing road network, it is not considered that the installation and operation of the project and associated works may affect the existing presence of these species of turtles and reptiles in general to the extent that it may cause problems. However, **in the additional mitigation measures section, measures are proposed to reduce any minor potential for adverse impacts to this class of fauna species as well.**

Remaining species

As regards invertebrate species, it is considered that the construction and operation of the WPP cannot cause any impact on their populations or conservation status.

Action Plans for Avifauna

Species Action Plans (AP) are guiding documents that have been used in Europe for the last 30 years. The implementation of the Action Plans is a key management tool for the protection and management of species (more than 50 AP) for Annex I species of avifauna of the Birds Directive 2009/147/EC have been funded by the European Union since 1993.

Management Plans record the actions (institutional and management measures) required to stabilise and improve the Conservation Status of a species (or group of species) or habitat within a specific time frame. For each of the actions envisaged, the SA defines specific and measurable objectives, which are evaluated within a reasonable period of time, at which point they may be revised depending on the effectiveness of the actions implemented.

The Action Plans shall include detailed information on the biology and ecology of the species concerned and shall reflect in the most detailed way possible their current status: Distribution, population status, pressures and threats, current protection status and active conservation programmes. A large number of institutions and stakeholders are involved in their implementation.

The most recent and updated Action Plans are the European (EuroSaps) which list the threats facing the species and the proposed actions - measures to address them by country.

The immediate objectives to be achieved in order to fulfil the purpose of the European APs are

- the elimination of the threats that have caused the decline of species,
- increase their population size, breeding range and productivity,
- ensuring good quality breeding and feeding habitat; and
- increase connectivity and communication of existing metapopulations through the creation of secure population corridors and links.

The LIFE-IP 4 NATURA project entitled "Integrated actions for the conservation and management of Natura 2000 sites, species, habitats and ecosystems in Greece" (LIFE16 IPE/GR/000002), is the first LIFE Integrated Project (LIFE IP) approved for Greece and the most important project of the last decades for the protection of Greek nature.

The project is not yet completed as it has a duration of 8 years (2018-2025) and a budget of €17 million.

One of the Action Plans established and part of the preparatory actions of the Life - IP4 Natura project is the "National Action Plan for the three scavenger species (Vulture, Hornbill and Blackbird)".

The purpose, objective and measures of the National Action Plan are explained in the following paragraph.

A) National Action Plan for the three scavenging species of ornithofauna (vultures): bearded vulture (Gypaetus barbatus), Eurasian griffon vulture (Gyps Fulvus), cinereous vulture (Aegypius monachus).

The National Action Plan for Scavengers is implemented, monitored and supervised by the Natural Environment and Biodiversity Management Directorate of the Ministry of Environment in cooperation with OFYPEKA and the time frame of the plan is 6 years.

The aim of the NAP for scavengers is to contribute to the increase in the range of the species to 1990-2000 levels, while in terms of population size an increase of 10 to 20% should be achieved, according to the NAP tables.

The objective of the NAP is to take measures to achieve the conservation and increase in population size and geographical distribution of vultures at local and national level.

Specific Objectives are:

- To maintain the already existing reproductive distribution of the species and to avoid further dramatic decline of their populations (reduction of their mortality at national level and as a priority in NATURA 2000 sites).
- To maintain and improve the habitat of existing breeding nuclei. (i.e. critical breeding and maximum foraging habitat).
- The collection of primary data on the biology and ecology of vultures in areas where this is required, with a focus on mapping historical and active breeding sites (nationally).
- The spatial mapping and conservation of critical breeding, dispersal and foraging habitats, and their improvement,
- The cooperation and active participation of relevant agencies and land users to reduce threats to vultures and their habitats. The recovery of small breeding populations and their productivity through increased abundance and availability of food
- The recolonization of portions of the historic ranges of the three species through strengthening and enriching local populations, establishing breeding nuclei, and increasing connectivity among them.
- The institutional integration of vulture conservation into national and regional policies, with priority given to NATURA 2000 sites, and the improvement of legislation on illegal activities such as the placing of poison baits.

For the preparation of the National Action Plan for Scavengers, a key prerequisite was the selection of the species/group of species. For this Action Plan, scavenging birds (vultures) were selected as one of the most well-studied groups of birds for a number of reasons:

Ease of detection and identification due to size, iconicity, rarity and risk status, direct linkage and dependence on anthropogenic activities.

For this reason, the population status (distribution, size) and trends of Vulture species in Greece are very well documented, while the factors influencing their population status are also well documented.

Also additional factors supporting this choice are:

- The implementation of previous or still active local conservation programmes for vultures (Dadia, Crete, Meteora etc.).
- All three species are threatened in Greece (classified in some risk category) - Vulture: "Vulnerable" VU (populations of mainland Greece and Cyclades are considered "Critically Endangered", CR), Vulture: "Critically Endangered", CR, Black Vulture: Endangered, EN).
- Due to their high dependence on anthropogenic activities, this CR can yield significant co-benefits for society, which is a positive promotion of CR as management tools.
- Due to their large territory and the diversity of habitats they use, they can act as umbrella species not only for avian species, but for wildlife and natural habitats in general.

- Due to their common ecological requirements, actions that can be carried out once can benefit all three species of Vulture.

Based on the above conditions, the selection of the three scavenging birds of Eurasian griffon vulture, cinereous vulture and bearded vulture was carried out. For the fourth species of vulture in Greece, the Egyptian vulture, a separate project has been carried out in the Life+ project "The return of the Egyptian vulture" (LIFE10 NAT/BG/000152) for which the objectives, measures/actions and results of the project are described in detail in the next paragraph.

The following table lists the measures/actions to be taken in relation to the objectives and the existing threats.

Aims	**Measures/Actions**	**Relevance to existing threats**
Improvement of knowledge and documentation of the effects of the use of pesticides and other banned toxic substances in poison baits on the viability of vultures	Implementation of a uniform information collection system with specific protocols for the recording of poisoning incidents and collection of dead animals by public services (Directorate of Veterinary Services Ministry of Rural Development and Food/Ministry of Environment & Energy). Issue of a relevant circular.	Illegal use of poison baits
	Development of an easy to use, standardised and seamless system for the storage and transport of dead vulture tissue/organ samples through the competent services and certified procedures for toxicological analyses.	
	Reinforcement and operation of a Veterinary Centre in Athens. Conducting necropsies, histopathological examinations and toxicological analyses on poisoned/dead vultures	
Reduction of vulture mortality due to consumption of poisoned baits.	Amendment and implementation of the Joint Ministerial Decision "Local Action Plan to prevent the illegal use of poisoned baits" (Government Gazette 3793/B/3-9-2018) and development of a new relevant Joint Ministerial Decision in cooperation with the Ministry of Rural Development and Food to cover errors and legislative gaps that have already been identified in its implementation. Adoption of a Strategy/Roadmap and establishment of a working group for the collective implementation of measures in local action plans	
	Establishment and operation of seven regional teams of dogs specially trained in the detection of poison baits/ Systematic patrols/inspections in critical high-risk areas by the Forestry Services (or other relevant services).	
Reduction of interactions/competition between carnivorous mammals and human activities	Implementation of loss prevention methods to reduce losses in crop and livestock production (e.g. subsidies for electric fencing, etc.) and pilot application of new techniques (e.g. fladry technique)	
Reduction of interactions/competition between carnivorous	Improvement of the compensation scheme of the Hellenic Organization of Agricultural Insurances (simplification of the declaration and inspection	1. Illegal use of poison baits

mammals and human activities	procedure for compensation, reduction of the minimum number of animals required, reduction of the payment time, compensation of 100% of the value of the damage, etc.) and linking compensation schemes to preventive measures in areas of high risk of attacks and high risk of livestock losses.	
	Maintenance of high densities of wild ungulates (mainly chamois, deer) to ensure food supply for wild carnivores through appropriate management (e.g. reintroduction, strengthening of small populations, regulation of livestock grazing, ensuring access to water bars, guarding populations).	1. Illegal use of poison baits 2. Food insufficiency 3. Degradation of foraging habitat.
Minimization of vulture mortality due to NSAID consumption.	Investigation and monitoring of the use/approval of veterinary formulations of non-steroidal anti-inflammatory drugs (NSAIDS) that are harmful to vultures in their critical areas/inform users of their harmful effects through vulture population management seminars.	Use of Harmful Veterinary Formulations
Assessment of mortality due to electrocution and collision with electricity generation and transmission infrastructure	Establishment of protocols and composition of guidelines on systematic monitoring (recording of dead birds) in existing electricity transmission networks in the vicinity of breeding and roosting sites of vultures.	Electrocution & Impact on man-made structures & infrastructure.
	Establishment of mandatory post-construction monitoring programmes and assessment of vulture mortality and displacement from power generation and transmission infrastructure using a specific methodology. Establishment of an Environmental Condition (in approvals of environmental terms and conditions of power generation and transmission projects, e.g. WPPs) of free access to information and implementation of a uniform information collection system with specific protocols for the recording of incidents of collisions and collection of dead animals by the forestry services.	
Assessment of mortality due to electrocution and impact on electricity generation and transmission infrastructure	Mapping and assessment of the effects of electrocution and impact (and their cumulative effects) on power generation and transmission infrastructure in relation to the flight behaviour and biology of vultures	
	Application of techniques to reduce mortality due to electrocution or collision with W/T or power cables (poles insulation, undergrounding of cables and/or use of twisted insulated wires, marking of cables, selective W/T disconnection).	
Reduction of vulture mortality due to collision with power generation infrastructure	Integration of sensitivity maps in the new spatial plan for RES for proper zoning generation infrastructure and electricity production and transmission	
	Implementation of mitigation measures in WPPs where at least one vulture collision incident has been recorded. Mandatory introduction of a condition in the AETCs (Approvals of Environmental Terms and Conditions) to implement an immediate shutdown system, in line with best international practice, which includes the employment of field ornithologists on a permanent basis to alert in case of approach of vultures - raptors (Aquila	

	spp., Haliaeetus albicilla, Clanga spp.); and shutdown of W/Ts based on a specific protocol. Permanent cessation of wind turbines in the event of repeated incidents of collision and whereas mitigation measures have not been effective	
Zero mortality due to poaching	Increased patrols in areas with recorded cases of poaching of Vultures/Raptors	Direct pursuit/killing by man
Minimization of illegal trade and trafficking of vulture samples	Recording of illegal trafficking incidents and investigation of e-commerce (embalmed vultures, live specimens, eggs) and assessment of the problem / Cooperation with the Cybercrime Unit for criminal prosecution	Trade and Embalming
Zero drowning mortality in artificial reservoirs	Mapping of dangerous reservoirs in island and continental areas/Development of guidelines for safe construction for wildlife in artificial water bodies	Other causes
Optimisation of artificial feeding practices	Elaboration of technical and sanitary specifications for the establishment and operation of Raptors' Supplementary Feeding Stations (RSFS)at a national level / Proposed siting with assessment of existing food abundance and availability in vulture distribution zones and assessment of potential feeding of regional RSFSs in critical areas for vulture conservation	Food insufficiency
	Establishment and operation of a network of RSFSs at a regional level, with the development of cooperation between public services, Protected Area Management Bodies and their successor Protected Area Management Units of Natural Environment & Climate Change Agency (NECCA), NGOs and social partners (e.g. producers) in optimizing the disposal of the dead biomass produced in RSFSs / Promotion of cross-border cooperation in border areas and their parallel monitoring with simultaneous counts	
Optimisation of artificial feeding practices	Monitor the use of RSFSs and study the behaviour of scavenging species for potential negative effects of their operation (e.g. interspecific competition, low juvenile distribution, etc.) and the interactions between pets (dog) and vulture populations and the risk of transmission of zoonoses through the operation of RSFSs	
Adaptation to European directives/regulations on the disposal of dead animals in the field	Harmonisation with Union legislation and development of the appropriate legislative framework for the implementation of EU regulations on the free disposal of dead animals within the SPAs.	
	Promotion (informational campaign, introduction of incentives such as the exemption of the payment of a fee for the collection of dead animals for compulsory cremation) of all traditional vulture-friendly practices for the disposal of dead animals and their institutionalisation within SPAs at local level	
	Pilot planning and operation of small, scattered feed depots, cooperation with livestock farms, transport of dead animals, informing	
Promotion of traditional/extensive forms of livestock farming	Promotion of agri-environmental policies for the development of extensive/nomadic livestock farming (implementation of union regulations, sustainable management of mountain pastures, management plans	

	for grazing/improvement of products from free range animals)	
Increase in genetic diversity of vulture populations and reduction of the effects of inbreeding	Renewal and updating of the legislative framework for the licensing and operation of Care Centres and the establishment of breeding programmes in captivity in their facilities by Ministries of Environment and Energy/Rural Development and Food.	Small population size - Low genetic diversity
	Establishment and institutionalization of a supervisory authority at the Ministries of Environment and Energy/Rural Development and Food (along the CITES Committee lines) with specific responsibilities in enrichment programmes with the coordination of the Ministry of Environment and Energy and the cooperation of public bodies and NGOs/ Development of memoranda of understanding between the Supervisory Authority, Protected Area Management Bodies and Conservation Centres	
	Support and participation/cooperation with existing European captive breeding programmes (EASA, LIFE, breeding centres, etc.)	
Restoration of the vulture population locally by repopulating critical areas	Establishment and support of appropriate infrastructure per region for state-supervised vulture reintegration and empowerment programmes (e.g. acclimatisation cages, vulture maintenance) in SPAs and protected areas with their management bodies with small or isolated vulture populations/ Release of individuals from Care Centres in Greece	Small population size - Low genetic diversity
Facilitation of communication and linking of vulture metapopulations	Develop telemetry and individual ringing programs to identify feeding and distribution areas of juveniles and combine the data with mapping of critical vulture conservation priority areas.	
Facilitation of communication and linking of vulture metapopulations	Establishment of "connectivity corridors" between vulture metapopulations by managing foraging habitat and siting and operation of RSFSs.	
Increase of the reproductive success of populations	Delineation of sensitivity zones near colonies and nesting territories/ Proposals to adopt HRM (Human Resources Management) regulations and restrictions (spatial and temporal) on human activities (climbing, aerial flying, hunting, logging, rock lighting, etc.) in the vicinity of vulture critical areas	Disturbance at breeding sites
	Promotion of silvicultural management in selected forest stands / maintenance and increase of suitable nesting sites for Cinereus Vulture / reduction of accumulated biomass in selected stands by mechanical means, cutting and crushing / dispersal of riparian and shrub vegetation to shield Cinereus Vulture nesting sites	Destruction of breeding habitat
	Maintenance of vulture accessibility to natural water bodies and streams by halting horizontal spread of forest in small areas along streams.	
	Implementation/application of other specific protection/management measures for Cinereus Vulture in accordance with the Joint Ministerial Decision 35633/13-10-2006, the 10-year Special Management Plan for Zone A of the Forest of Dadia National Park that is already	

	being implemented and the proposed actions of the Special Environmental Study of the area	
Increasing the viability and productivity of the vulture breeding population	Construction of suitable water reservoirs (including the installation of metal structures where there is no other option) for use by vultures during periods of maximum water shortage in critical island areas.	Degradation of foraging habitat
Improving our knowledge on the distribution and population status of vultures	Establishment and updating of the National Database on Vultures regarding their distribution and population status / simultaneous recording of all mortality events	Gaps in knowledge on distribution, status, productivity and mortality of vultures in Greece
	Establishment of a uniform, standardised protocol for fieldwork to record and monitor vulture populations	
	Implementation of a national vulture census programme (3 times in 6 years, to assess population trends) - Mapping of all active and historical colonies / Annual fieldwork in selected colonies/ territories and assessment of vulture breeding success	
Improving our knowledge on the effects of lead use on vulture populations	Application of direct and reliable techniques for the detection of molybdenum in laboratory analyses (in certified public laboratories); / Lead sampling in scavenging predators in care centres; / Quantification of the incidence of lead poisoning in vulture populations through sampling.	
	Research on infectious disease mortality/development and implementation of a biomedical protocol for the collection and preservation of dead scavenging birds of prey	Lack of knowledge about the level of exposure of vultures to toxic substances and the degree of their bioaccumulation
Evaluation/assessment of the cumulative impact of the operation of the WPP on vulture populations.	An assessment study to evaluate the cumulative impacts of operational and under development WPPs (habitat degradation/ displacement/impact on vulture populations) on vulture populations.	Lack of assessment of the cumulative impact of electrocution and energy infrastructure impacts on vulture populations.
Development of a species recovery plan on a national or regional scale	Feasibility study for the enhancement of the natural populations of vultures in Greece/ Preparation of a release plan release strategy on a national or regional scale.	Lack of a restoration plan vulture populations for reintroduction or enrichment.
	Development of models of habitat suitability and potential spread of vultures (habitat suitability)	
Increasing the viability and productivity of the vulture breeding population	Rationalisation of the criminal framework for dealing with the problem	Mortality due to exposure to toxic substances.
	Promotion of legislation to ban the use of lead and lead-based paint reducing the risks of lead exposure to wildlife and public health / Extend the implementation of the Joint Ministerial Decision on the prohibition of lead pits in wetlands throughout the country.	

	Promotion of legislation to reduce the use of dangerous NSAIDs in wildlife from the veterinary market	
	Implementation of legislation on environmental liability/damage in cases of vulture killing (addressing complaints, speeding up procedures, investigating incidents, penalties)	Θνησιμότητα λόγω ηλεκτροπληξίας ή πρόσκρουσης σε υποδομές
	Establishment and legal consolidation of the RSFS operation for scavenging species at a national level. Necessity for institutionalisation of a study for RSFS specifications	Food insufficiency
Integration of the National Action Plan into regional policies	Integration of provisions of the vulture conservation action plan into the management plans of protected areas and monitoring	Lack of integration of vulture conservation in the national environmental policy.
	Monitoring and evaluation of the implementation of the action plan	
Prioritising conservation of vultures in the daily agenda of responsibilities/ actions of public services	Conduct at least 4 local seminars for the employees of the forestry and veterinary services, the environmental sectors of the regions, the gamekeepers of hunting organizations and the supervisors of the Protected Area Management Bodies (PAMBs) on issues related to the management of vulture populations (population monitoring methods, management tools, vulture ecosystem services, illegal use of poison baits, administrative issues regarding the implementation of infrastructure mitigation techniques	1. Low priority in the implementation of vulture conservation actions by the responsible public agencies 2. Electrocution & Impact on man-made structures & infrastructure 3. Lack of information/training of the competent public services in vulture conservation actions in Greece
Reduction of negative impact of human activities on vulture populations	Awareness-raising/sensitisation of land users and stakeholders (farmers, beekeepers, hunters, tourism operators, etc.) and the general public in areas critical for vultures on issues related to the management of their populations (ecosystem services provided by vultures, effects of the use of poisoned baits, alternative methods of mitigating and controlling damage to livestock by carnivorous mammals, etc.)/provision of information material on the conservation and ecological value of vultures.	Lack of information to stakeholders/land users on the conservation status and threats to vultures.
Dissemination of information on the need to preserve the vulture population	Special topics on the ecological value and the need for conservation of vultures in the Information Centres of the Management Agencies (Protected Areas where vulture species occur).	Low dissemination of information regarding the conservation of vultures in Greece.

Following the above-mentioned action plan for scavengers, data from the Life P4 Action C.1 deliverable "Identification of critical habitats (sensitivity mapping) of the Griffon Vulture in Greece - Determination of management guidelines" were used. This deliverable is a basic guide for the subsequent definition of management guidelines and implementation of conservation measures with the aim of improving the current conservation status of the griffon vulture species.

Identification of critical habitats (sensitivity mapping) for the Griffon Vulture in Greece - definition of management guidelines Action Deliverable C.1

One of the main objectives of the implementation of the National Action Plan (NAP) for scavenging bird species, as provided for in the relevant Ministerial Decision (YA 68086/2149, Government Gazette B' 3663/9.8.2021), is the identification, spatial mapping, conservation and improvement of critical habitats for breeding, dispersal and feeding.

The aim of the service is to identify and map the areas used by vultures in Greece in the first phase and to identify the critical breeding and feeding habitats in the second phase.

The identification and mapping of the critical habitats of the Griffon Vulture is an immediate priority for the implementation of the ESD as:

- ✓ It is currently the most widespread vulture species in Greece, while the distribution of the Griffon Vulture is limited to Crete and that of the Cinereus Vulture to Thrace.
- ✓ Due to its wide distribution (compared to the other two species) in the areas of Crete and Thrace, the mapping of critical habitats largely covers both the Griffon Vulture and the Cinereus Vulture and is an "umbrella" for the other two species, as the current consumption of the Griffon Vulture overlaps 100% with that of the Griffon Vulture and 75-80% with that of the Cinereus Vulture.
- ✓ There is a large amount of information on this species from field monitoring of populations and from the large number of satellite tags that have been placed on Griffon Vultures in Greece and the Balkans.

The report outlines the management priorities for the vulture in relation to the main threats it faces, as detailed in the National Action Plan.

The most immediate management priorities are

- ✓ With regard to the use of poisoned baits, the preparation and implementation of the local action plans of the government ministerial decision of the Ministry of Environment and Energy Υ.Π.ΕΝ. 83415/2715/2022 and the activation and patrolling of the special units for the detection of poisoned baits in the high risk areas.
- ✓ With regard to food scarcity, the establishment and operation of raptor feeding areas (RSFS) in medium and low sensitivity areas, with the aim of expanding the current distribution and taking into account that the high sensitivity areas (hence permanent/regular intensive presence of vultures) are inevitably linked to sufficient food availability.
- ✓ With regard to the impact of wind turbines, the definition of exclusion zones for the installation and operation of wind turbines in the high sensitivity zones and their inclusion in the spatial planning for renewable energies.
- ✓ With regard to electrocution and the impact on electricity transmission infrastructure, mapping of the electricity transmission network in the highly sensitive areas and identification of high-

risk sites for subsequent implementation of mitigation measures (insulation of pylons, installation of buoys, etc.).

B) National Action Plan for the Egyptian Vulture (Neophron Percnopterus) in Greece

In the framework of the LIFE+ project "The Return of the Egyptian Vulture", the Ornithological Society, in collaboration with WWF-Greece, has prepared the National Action Plan (NAP) for the Egyptian Vulture, which aims at the conservation of the species in Greece and the recovery of the population in its breeding areas. The NAP provides a framework for the conservation of the species at national, regional and local levels, based on the effective coordination of actions and the different services and stakeholders involved.

The National Action Plan for the Egyptian Vulture (Neophron Percnopterus) was approved by Government Ministerial Decision No. 43236/1053/3760B/25.10.2017.

According to Article 5 of the GMD, the timeframe of this National Action Plan for the Egyptian Vulture in Greece is 5 years (2016 to 2021).

The National Action Plan (NAP) aims to halt the sharp decline in the population of the species and prevent the extinction of the Egyptian Vulture in Greece by taking measures to halt the decline, stabilise the breeding population of the Egyptian Vulture and optimise the monitoring and research of the population of the species in Greece.

The specific objectives of the NAP are

1. **Population conservation**: To halt population decline by providing safe breeding areas with reduced risk of poisoning, collision and electrocution, increased food availability and reduced disturbance around nests.
   Monitoring and research i) Continuation of the species monitoring programme. ii) Research into the causes of species mortality. iii) Study of species viability. iv) Assessment of bioaccumulation risk. v) Research into population enhancement.

2. **Legislation and policy**

   i) Preparation of a national action plan on toxic baits. The project will take into account the proposed actions of the corresponding European Action Plan of ENEC (European Network against Environmental Crime) and the proposed actions of other LIFE projects.
   (ii) The use of alternatives to diclofenac with comparable efficacy that have been shown not to harm scavenging birds.

3. **Communication and education**
   i) Training of staff of relevant services in the correct response to incidents of poisoned bait in the areas of implementation of the NAP.

ii) Informing and educating stakeholders on species conservation issues in the areas covered by the NAP.
iii) Informing and raising awareness of the public on species conservation issues.

The table below lists the measures/actions in the Action Plan of the Programme Objectives.

Parameters	Target	Measures/Actions
Population preservation	Reducing the risk of poisoning due to the illegal use of poison baits	Intensification of patrols/controls
		Recording of poisoning incidents and creation of risk maps
		Provision of electric fencing to land users operating within the areas where the Egyptian vulture occurs
	Reducing the risk of collision with wind turbines	Creation of risk sensitivity maps and exclusion zones from wind turbines around nests and roosting sites
	Reducing the risk of electric shock and collision with power transmission and distribution network cables	Insulation of dangerous pylons and marking of electricity cables around nests, roosting sites, and migratory constrictions
	Increased availability of food	Establishment and operation of a network of feeding areas for birds of prey (FAOB)
	Reduction of disturbance during nesting	Establishment of protection zones around nests
		Seasonal (March-September) exemption for sports & activities through IACS
		Ban on lighting of cliffs with Meteora nests
Improvement monitoring and research of population Egyptian Vulture in Greece	Systematic Monitoring	Monitoring using standardized protocol. monitoring
	Research on the Mortality Research	Bird ringing
		Chick telemetry and where appropriate and where feasible adult individuals and spatial mapping of habitat use. and migration routes
		Creation and implementation of a biomedical protocol of dead birds
	Study of the viability of the species	Development of suitability models habitat suitability/species distribution
		Development of analysis models Population Viability Analysis (PSA)
	Evaluation of the risk assessment of the bioaccumulation of lead in the food chain	Lead sampling tests. on large birds of prey in the centers care centres
	Research on the strengthening the Population	Feasibility study for reintroduction-enhancement of the natural population in Greece
Legislation and Politics	Reducing the risk of poisoning due to the illegal use of poisoned baits.	Elaboration of the project "National Action Plan for Poisoned Food

		Lures"
	Reduction of risk poisoning.	Use of alternatives to diclofenac with comparable results, which proven not to harm scavenging birds.
Communication and education	Training of stakeholders to improve the response to poisoned bait incidents	Conducting information and training seminars for officials of the Forestry Services, the environmental sectors of the regions, game wardens of hunting organizations and supervisors of protected area management bodies.
		Conducting training seminars for the employees of the Veterinary Services
	Information and awareness-raising of interest groups.	Awareness of land users (farmers, hunters, beekeepers) for the protection of the Egyptian Vulture and the problem of poisoned baits
		Raising awareness of development stakeholders in sensitive breeding areas by providing them with information on the protection of vultures
	Public information	Public information and awareness campaign on poisons in the application areas
		Provision of Programme information material to target locations.

Mammals

With regard to the mammal species observed and recorded in the survey area, it is considered that the construction and operation of the park cannot cause significant or permanent disturbance or adverse impact. Apart from the construction phase of the project and its accompanying roads (which will be limited in size due to the presence of the existing road network), where there will be temporary mobility and minor landscape reshaping, the wider area will be 'allocated' to fauna species for use without any particular change in its characteristics, taking into account the mitigation measures that will also be proposed for this fauna class in a subsequent section. The mammal species recorded are species that are highly adaptable to anthropogenic influences and it is considered certain that their activity or vital habitat will not be disturbed or lost to the extent that their presence, the population they maintain in the area or the integrity of their habitats will be affected. These species are found in most parts of Greece and are species with satisfactory (e.g. hare) or particularly large populations (e.g. fox) and for this reason none of them are priority species of the neighbouring SAC of the Natura 2000 network, and are not included in Annex II of Directive 92/43/EOK.

Amphibians

One species of amphibian was found in the survey area, which is not classified as endangered, but is listed as Least Concern (LC) in the IUCN Red List of Threatened Species and is not a species listed in Annex II of Directive 92/43/EOK (it is a species listed in Annex IV of the Directive).

Reptiles

Six species of reptiles (three lizards, one snake and two turtles) have been identified and recorded in the study area, of which two species of turtles, the Grey Turtle and the Mediterranean Turtle, are listed in Annex II of Directive 92/43/EEC. The Mediterranean turtle (Testudo hermanni) is protected by Directive 92/43/EEC (Annexes I and IV) and the Bern Convention (Annex II). It is also protected by the CITES Convention (Annex II). According to the Greek Red Data Book, Testudo hermanni is classified as Vulnerable (VU) in Greece, while the IUCN classifies the species as Near Threatened (NT) at European level. The grey turtle (Testudo graeca) is protected by Directive 92/43/EEC (Annexes I and IV) and the Bern Convention (Annex II). It is also protected by the CITES Convention (Appendix II). According to the Greek Red Data Book, the species in Greece is classified as Least Concern (LC: of Least Concern), while according to the IUCN at European level, the species is classified as Vulnerable (VU).

Even the unlikely, accidental loss of individuals of the above species that may occur during the installation and construction process of the WPP will be negligible compared to the losses suffered by these species from other anthropogenic activities, such as vehicular traffic on all national roadways in the area and throughout their range. In addition, the populations of these species are unlikely to be disturbed by such incidental losses. Furthermore, primarily due to the fact that the Project area is not expected to support significant populations of these species, and that the construction of the Project area will primarily use the existing road network, it is not considered that the installation and operation of the Project and associated works could affect the existing presence of these turtle species, and reptiles in general, to the extent that it could cause problems. However, measures are proposed in the Additional Mitigation section to reduce any minor potential for adverse effects on this class of fauna species.

Other species

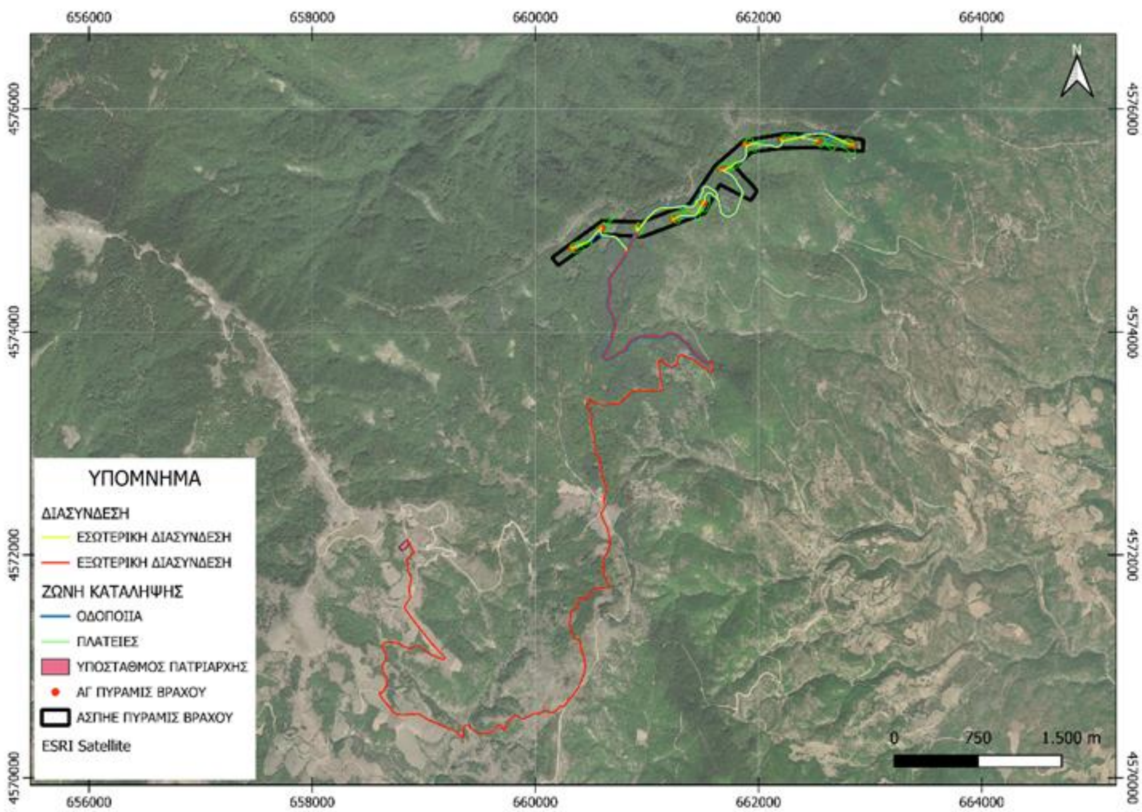
With regard to invertebrate species, it is considered that the construction and operation of the WPP will not have an impact on their populations or conservation status.

Impact assessment of associated projects

Concerning the associated works, for the works that are located within the production license blocks of the project, such as the control center, it is considered that no further reference is needed since the important structure on the site is the wind turbines themselves and any impacts mentioned in the literature are related to them.

For the most part, among the wind farms' associated projects that are usually considered for potential environmental impacts are the wiring and power transmission lines, which can become obstacles to the movement and flight of various bird species and cause collisions. There are many records in the international literature of accidents and losses of individuals of bird species due to collisions with power lines. Almost all the incidents concern cases of collisions with high-voltage cables or collisions with high-voltage cable pylons rather than medium-voltage cables. In this project, an underground connection to the grid is proposed to eliminate all the above negative impacts. The undergrounding of the cables is always proposed as a measure to avoid any impact on birdlife and the environment in general. In view of the above, it is considered that this type of cabling, for the transmission of the electricity generated, does not pose any risk to the avifauna of the installation area and its constituent species, and will not harm the conservation objectives of the area and its integrity.

Regarding road construction, this is almost entirely based on the use of the existing road network in the area and includes minor internal road widening for access to the wind turbines, and little improvements to the existing road network, as it is a developed network mainly due to livestock farming (Map 109). As a result, the accessibility of the site will not be burdened by the installation of the WPP and will not be greater than before its construction. However, measures will subsequently be proposed for the new section of the widening, although clearly limited in length, to prevent any additional burden from the movement of the public which includes any non-significant reason for working in the vicinity of the WPP.



Map 109: *Production permit polygon of the project under study (outline in black), wind turbine installation sites (points in red), associated works (wind turbine squares in green - roads in blue and internal interconnection in yellow - external interconnection in red).*

Consideration of alternative solutions

The siting of a wind farm is mainly determined by the locations where the wind potential occurs, i.e., by factors outside the possibility of human intervention. For this reason, the alternative siting of a specific project, i.e., the siting of the machines in other locations, can be done under conditions of energy efficiency of the project. The determination of the wind potential for the needs of a wind farm is based on the analysis of measurement results from wind stations located at key points in the area under study, with the parallel use of meteorological mathematical models to predict the distribution of wind flow at a specific height above the given topographical terrain and with the aim of a comparative assessment of neighboring areas. In addition, the siting of the wind farm considered elements such as the suitability of the area, the morphology of the site, the local slopes and foundation possibilities, as well as the safety of residential areas to minimize acoustic and visual disturbance. The distance of the wind turbine from the nearest settlement is greater than 500 m, as defined by the ΠΔ/25-4-89 (Government Gazette 293 τ.Δ./16-5-89). As for the selection of the wind turbine locations, it was based on criteria such as:

- The optimal wind potential of the region.
- The energy efficiency of wind turbines.
- The low atmospheric turbulence.
- The local ground slope and the suitability of in-ground foundations.
- The prevailing wind directions based on statistical analysis of wind data.

The above criteria led to the selection of the optimal location of the wind turbines, which contributes to the maximum utilization of the wind potential of the area and the maximum possible energy production. This location was selected as the optimal result of the combination of many parameters and constraints required for the implementation of a wind farm. These parameters and constraints are technical, economic, environmental, and social. Of decisive importance for the siting of such a project is the wind potential, which varies spatially, while an important parameter for the design of a wind farm is the occurrence rate of winds from different directions. The optimum location for the placement and operation of wind turbines are the ridges where there is the highest wind potential. The wind turbines should be placed in a specific arrangement, so that there are no problems of shading during the operation. Taking all the above information into account, the area under study meets all the requirements defined by Greek legislation and is considered suitable for the siting of a wind farm.

In the case of our study area, all the above characteristics were combined from the outset with the selection of a location that will ensure the least possible environmental impact from the construction and operation of the project. Thus, the sites selected:

- It is in a position that can easily and with the least possible environmental burden be accessed for the needs of the project, from the existing road network of the area, without the requirement of opening a long length of new forest roads in the wider study area.
- It is in an area where the above activity is permitted.
- The habitat types located within the area of the study WPP installation area are also abundant in the wider study area.

The analysis of all available data does not indicate any significant impact on the important avifauna species that make use of the WPP site, given the implementation of the measures proposed later in this report.

Alternative solution

Other polygons were initially selected in the wider project area, within which both the wind potential of the area and the local terrain slope and prevailing wind directions favored the installation of the wind farm. However, as a group, the above-mentioned sites were rejected during the initial planning process, as they are also located within Natura 2000 sites, but in locations where they occupied critical nesting and/or feeding areas for important species, and in areas with limited accessibility and therefore requiring long new boreholes.

All other alternatives were therefore rejected at the preliminary screening stage because of the potential environmental impacts they would be likely to cause.

Do-Nothing-Solution

Apart from the above and given that the promoter of the project under study has proceeded with an investment plan in electricity generation, the do- nothing option, i.e., not creating the investment, was excluded. The benefits of the WPPs have already been mentioned herein, and from the analysis of all the data provided and the mitigation measures proposed herein, the integrity of the area is ensured after the installation and operation of the project under study.

8. Measures to Deal with the Possible Consequences

Given that any anthropogenic influence on the environment causes impacts on a smaller or larger scale, it is appropriate to take measures to address them. The so far known and scientifically proven impacts of wind farms relate (in most cases) to impacts on the avifauna of the area, as mentioned in the previous section, and on the populations of Chiroptera, without however excluding impacts on other classes of wildlife. According to the recent manual "Good Practice Guide for Mitigating the Impacts of Wind Farms on Biodiversity Using Modern Technologies" (Fric et al. 2018) "if it is assessed during the preparation of the EIA/SEA that negative impacts from the wind farm on the environment may occur and cannot be avoided, measures are required, following the mitigation hierarchy, either (a) to investigate and implement feasible alternatives that will minimize the impacts, or (b) to implement appropriate mitigation measures that will eliminate the impacts or at least reduce them to an insignificant level." In this SEA, and although from all the above, it is assessed that the project under study will not cause significant adverse impacts in the study area, multiple measures are proposed that can act positively in minimizing any impacts that may be caused. These measures (measures, conditions, or restrictions) are currently divided into three categories: a) Measures proposed for implementation; b) Measures whose feasibility will be examined in the subsequent monitoring stages; and c) Mitigation measures to reduce potential future cumulative impacts.

A list of the measures, conditions, or restrictions proposed.

During the installation and operation of the wind farm, it is recommended that various measures are taken and implemented to minimize or eliminate any potential impacts on the protected objects of the area. These measures are listed below:

- **Installation of a visual automated wind turbine shutdown system**: Optical systems are based on high-resolution image analysis and target identification. These systems have the capability of visually covering the entire airspace of the wind turbine on which they are installed. Optical systems can be mounted on the wind turbine tower without any interference with the tower and with high-resolution cameras to cover a 360° surveillance area around the wind turbine. These systems have a range of a few tens to a few hundred meters, depending on the size of the bird species being monitored. A system can typically cover from one to three turbines depending on the wind farm sitting and the type of turbines. The operation is continuous and powered by the wind turbine. The system allows monitoring of the airspace it covers during the day and under clear visibility conditions. The detectability of flying fauna can be improved by adjusting the detection criteria based on additional information about the area in question. The system allows the monitoring of bird activity near wind turbines and can therefore be a complementary method to GPS telemetry and ornithological radar for determining flying fauna habitat use in wind farms. Monitoring is conducted using an automated recording system and the subsequent evaluation processing of the video recordings collected, both for species identification and for the rejection of other flying targets such as aircraft and insects. Mitigation in the case of the use of an optical system is related to the repelling of birds and/or the immobilization of one or more turbines in cases where birds are on a collision course with them. For this purpose, real-time recording of the movement of flying fauna and immediate decision-making is required. This is done using decision-making software and directly connected to a SCADA system to activate the wind turbine immobilization, and for the repelling command, it is connected to a loudspeaker system that emits sound signals of variable intensity depending on the estimated risk of impact. It should also be pointed out that this system can be set to operate without deterring birds but only by stopping the wind turbine, and the problems that may arise due to the morphology of the terrain can be overcome by the correct choice of the angle of placement of the cameras, to adequately cover the case that a bird comes from a lower altitude than the level of the cameras, due to the morphology of the terrain.

It is proposed that the installation of the above system should be mandatory in this project from the start of operation, due to the importance of the study area. The above-proposed system is advised to be configured to operate without bird deterrence (sound repulsion) during the breeding season and the chick feathering period, but only by stopping the wind

turbines to avoid the possibility of disturbance to the species and the possibility of displacement of the species from the study area. Also, given the morphology of the topography and the possibility of the passage of species of interest perpendicular to the axis of the study project installation from a low height, which is likely to be a "blind spot" for the detection system of the above-mentioned stopping system, it is proposed that the project promoter must carry out a preliminary study on the correct positioning of the camera angles to cover the above-mentioned possibility, while for those wind turbines where this cannot be covered by the installation of four cameras mounted on each wind turbine, it is proposed that the installation of a second set of cameras (eight tracking cameras on each wind turbine instead of four) is mandatory to fully cover the tracking of the species of interest from all directions of the horizon and all possible heights. Other vital parameters that should be rigorously adjusted to achieve the goal of minimizing the probability of collision are proper parameterization according to the biometric characteristics of the species in the area and short response time from species detection to complete wind turbine stop, data that are subject to modification in most of the commercial models of automated wind turbine stopping system**. It is also considered important that after the installation of the project under study, the above-automated wind turbine shutdown system be operated with the simultaneous, daily, and uninterrupted presence of at least three ground observers** *(foresters or biologists ornithologists, or other related disciplines, with proven knowledge of bird identification),* **who will also have the possibility of stopping the operation of the wind turbines of the project under study in the event of a dangerous flight of species of interest until the above-automated stopping system is correctly configured.** The above is considered necessary given possible technical difficulties that may arise, but also given the adjustment requirements of these systems, based on the characteristics of the area where they are installed and the species of birdlife in each area.

- **Resting or roosting sites**: no paddling structures that allow birds to perch or congregate should be used in any installation.

- **Shutdown of the wind farm during conditions of limited visibility due to cloud cover and extremely adverse weather conditions**: Incidents of collisions have been observed in conditions where highly foggy conditions or extreme weather events such as thunderstorms have prevailed, when visibility in the area is significantly reduced. By shutting down the wind turbine of the WPP during extreme weather conditions, any risk of collision with the wind turbine is significantly reduced.

- **Lighting at the wind farm**: Constant lighting of wind turbines should be avoided to reduce the risk of impact. If this is unavoidable, white flashing strobe lighting could be considered as less attractive to birds. This measure, with its irregular strobe lighting, is now used in all modern technology wind turbines, such as the turbines of the wind farm under construction.

- **Undergrounding of cables**: structures such as power transmission cables must be sited after very careful planning. Electricity transmission infrastructure (in general, but also in the case of wind farms) should be underground or, if this is not technically possible, may be above ground, but it should be ensured that they are properly insulated and marked to minimize the risk of electrocution and birds striking them. The wind farm in question is proposed to be connected underground to the grid.

- **Removal of dead animals**: One of the most important measures that should be foreseen is the obligation to immediately remove dead animals (dogs, sheep, goats, horses, cows, etc.) found within a radius of at least 500 m from the base of the wind turbines. **These dead animals should be transported to safe locations away from the wind farm, while remaining available for scavenging birds and carnivorous omnivorous mammals**. This will reduce the risk of scavenging species colliding with the wind turbines when they spot each dead animal and will not affect the availability of their food. The responsibility for the collection and transport of dead animals should be the responsibility of the wind farm construction and operation company and the personnel employed daily will have, as part of their duties, the responsibility of removing such potential food source that could attract predators, especially scavenging species, causing a higher concentration than recorded in the area.

- At the same time, particular care must be taken during the construction and installation of the park to ensure that **the work does not coincide with critical periods for the fauna of the area**, regardless of the importance of the species, to avoid disturbance at this critical stage of their biological cycle (the period of breeding of fauna species or nesting and rearing of young birds).

- **Restoration of the surrounding area**: After construction work is completed, it is proposed that all unnecessary roads and encroachments be restored to limit access to the area resulting in reduced disturbance. No amount of excess material resulting from road widening should remain in the project area, but all of it should be removed to an adjacent, appropriately licensed, equivalent site. **Furthermore**, given that the increase in the number of visitors to an area is positively related to the creation of a new road network, it is proposed for the study area that, following the necessary consultation with the competent authorities, the sections of the new road openings that will result, despite their relatively short length, **should not be in common use for all**. It is proposed that a barrier be placed at the beginning of the sections of the new openings, after the construction of the project, and that only those involved in the maintenance and operation of the project and, of course, the competent authorities responsible for the study area should have access to the access road. Furthermore, given that the needs of the project after construction are much smaller than during the construction phase, it is proposed that the width of the road deck after construction be reduced to the minimum required for the maintenance and operation of the project.

- **Provision for mitigation of herpetofauna mortality during the construction phase**: Given that individuals of the gray turtle (*Testudo graeca*) and the Mediterranean tortoise (*Testudo hermanni*), which are species listed in Annex II of Directive 92/43/EOK and the same time species with a limited ability to avoid anthropogenic hazards due to their low speed of movement, have been observed in the wider construction area of the project under study, it is recommended that during the construction phase of the project and its accompanying works, a daily scanning by a specialist of the areas to be affected by earthworks. The movement of individuals of the above-mentioned species likely to be found outside the area occupied by the works mentioned above should be conducted by a specialist surveyor. This will also prevent the accidental mortality of individuals of the above species during the construction phase of the project.

- **Monitoring of impacts on avifauna - fauna**: There should be an explicit obligation to monitor the impacts of the park, especially on avifauna species and other terrestrial fauna, after construction, and during the pre-construction and construction period, for at least four years (in total). The method of monitoring should meet specific standards to be defined by the competent Ministry of the Environment, Nature Conservation, and Nuclear Safety or by the consultative bodies or suggested by the international literature. Monitoring is proposed to be conducted by a team of experts, following a specific monitoring protocol. This way can ensure that data is obtained continuously and can be made available to all stakeholders and interested parties.

In addition to the above measures and monitoring, which is discussed further below, no other type of monitoring is proposed, using technical or other equipment, which cannot replace the experience and judgement of specialist observers and can easily lead to underestimation or overestimation of situations and impacts.

(b) Measures whose feasibility will be examined in the subsequent monitoring stages

If during the subsequent monitoring stages (installation of the WPP and operation of the WPP) a change in the frequency of passage of important species of avifauna is observed and it is considered that, based on the new data obtained, there is an increased risk of collision - causing an accident, then it is proposed to consider the following proposed measures and, after documenting them, to propose those that will be evaluated as the most efficient (without rejecting the documented proposal of other measures not mentioned herein).

Therefore, after the construction of the wind farm, it may be necessary to actively manage the habitats in and around the wind farm so that birds are not attracted to the zone of influence of the turbines and are removed to locations that do not pose an impact risk. The responsibility for the design and implementation of these management measures lies with the wind farm operator.

- **<u>Active management of the habitats under the wind turbines</u>**: In those cases where post-construction monitoring identifies some impacts (increased concentration or mobility of species on the site, incidents of impact of specific species) on specific wind turbines, it is proposed to design active management actions for the areas under the wind turbines (creation of undesirable habitats for birds) after appropriate studies. These studies must also consider the other flora and fauna species in the area.

- **<u>Active management of habitats around the perimeter of the wind farm</u>**: It is possible that in cases where a wind farm is in an area where there is a need for bird protection measures, active habitat management around the periphery of the wind farm may be required to create suitable habitats to attract birds away from the turbines. Such management actions could, for example, include plowing and seeding of abandoned fields and clearing of forested fields after appropriate studies, so that species of interest likely to be affected by the wind farm are driven to safe alternative sites and indirectly favored. These studies should necessarily consider the potential impacts that will be assessed during the first period of operation of the wind farm and the other flora and fauna species in the area.

- **<u>Increase in the starting speed of wind turbines</u>**: If there is an impact on Chiroptera from the installation and operation of the wind turbine under study, and as soon as it is identified (e.g. finding a significant number of killed Chiroptera individuals from the operation of the wind turbine), it is proposed to implement the measure of increasing the starting speed of the wind turbines. When implementing this measure, it is suggested, to avoid wind conditions with the highest bat activity, to increase the wind turbine starting speed and blade rotation speed so that at low wind speeds, about 3.5 m/sec, the rotation of the wind turbine rotor is avoided (Fric et al. 2018). Wind turbines "spin freely" at wind speeds less than the activation wind speed (i.e., the minimum speed at which the turbines produce energy). The unnecessary wind turbine activity described above can be reduced in three ways: a) by sweeping the blades (so that they are parallel to the direction of the prevailing wind, in effect reducing their surface area), b) by increasing the activation wind speed, and c) by implementing methods that prevent the blades from rotating at lower wind speeds (Rodrigues et al. 2015, Arnett 2017). Evidence from Europe and North America suggests that trimming and increasing wind activation speeds are the only proven ways to reduce bat mortality due to impact (Rodrigues et al. 2015, Behr et al. 2017).

- **<u>Monitor potential impacts to Chiroptera</u>**: If an impact from the installation and operation of the studied WPP on Chiroptera occurs, and as soon as it is detected (finding a significant number of killed Chiroptera from the operation of the WPP), it is proposed that, in parallel with the monitoring of the potential impacts on avifauna and other terrestrial fauna, a corresponding monitoring of the potential impacts on Chiroptera is proposed, despite the fact that the site of the proposed WPP is not located within a significant area of presence or feeding of Chiroptera. The monitoring, in this case, should also be carried out by expert scientists in order to ensure the correct selection of monitoring methods based on the standards of relevant international-national research programs, the correct assessment of the impacts, and, consequently, the correct selection of additional mitigation measures (if any), e.g. e.g. even avoiding activities during periods when bats are most sensitive to disturbance (e.g. breeding, hibernation), as well as during transits and foraging based on local knowledge, etc. (Fric et al. 2018).

- **Painting a wind turbine blade with black paint**: As mentioned again in this SEA, a recent study has shown that painting one wind turbine blade with black paint may help reduce the annual mortality rate compared to wind turbines where this treatment is not performed, with the greatest effectiveness of the proposed measure being observed in raptors, which are the species of interest in this Special Ecological Assessment, as they have higher visual acuity and sharp vision at long distances.

- **Complete shutdown of the wind turbine during sensitive periods**: In the event that the processing of the recording data from the automated wind turbine shutdown system or the simultaneous presence of field observers during the proposed monitoring programs after installation of the project under study indicates (from analysis of recorded video or field observer observations) that the risk of impact during a period is critically high, and cannot be minimized through periodic shutdowns, then a complete shutdown of the project may be proposed for as long as it is assessed to be necessary, e.g. 10 - 15 days.

(c) Mitigation interventions for potential future cumulative impacts

This section presents a proposal concerning interventions to mitigate the potential cumulative impacts of energy production and transmission projects in the wider region of Thrace and concerns actions that can be adopted in the event of the installation of all the planned WPP projects within the protected areas under study (SPA GR1110010 and IBA GR003).

In the context of this SEA, potential significant impacts have been assessed in the case of the construction of all the WPPs under license within the protected areas under consideration, however, the contribution of the WPP under consideration is assessed as minor. However, for both this and the other projects under licensing to mitigate any negative impact on the ecologically sensitive area under consideration, it is proposed that they contribute to a broader action plan of cumulative impact mitigation interventions in line with the recommendations of the National Scavenger Species Action Plan (Xirouhakis 2019).

As stated in the above deliverable *"The most recent and up to date SAPs for vulture species are the European (EuroSAPs), with references to the threats facing the species and proposed actions to address them by country (Andevski & Tavares 2017, Izquierdo 2017). The purpose of these SDs is to restore vultures to their previous distribution ("original distribution range") and to maintain their populations at a favorable conservation status* *("favorable conservation status"). The (spatial and temporal) reference points are the distribution and population size of the species before their collapse, i.e., mid-20th century, with the aim of listing them as 'Least Concern' (LC) on the IUCN Red List of Threatened Species (IUCN Red List of Threatened Species, Birdlife International 2016). The immediate objectives to be achieved to fulfil the purpose of the European LCs are a) to eliminate the threats that caused the decline of the species, b) to increase their population size, breeding range (breeding range) and productivity, c) to ensure good quality breeding and foraging habitat, and d) to increase connectivity and communication of existing metapopulations through the creation of secure corridors (population corridors and links). All the above is practically assumed to be achieved in Europe by 2028 with 10 individual specific objectives:*

1. Improving our knowledge of vulture species (accurate information on their distribution and population size).

2. Eliminate or at least drastically reduce poisonings through consumption of poisoned animals or baits (better understanding of human-wildlife interactions, especially with carnivorous mammals, informing land users about the risks of poisons, reducing vulture mortality by 50% compared to previous decades e.g., 2000-2015).

3. Reduce mortality due to consumption of veterinary drugs (NSAIDs) (understanding and assessing the problem, banning dangerous drugs).

4. Reduce mortality due to lead poisoning (assessment of the problem, ban on the use of lead in hunting ammunition, and implementation of alternatives).

5. Improve food sources for vultures in terms of quality and quantity (artificial food supply, halting the decline of extensive livestock farming, increasing wild ungulate populations, better management of available dead biomass in the countryside).

6. Eliminate or at least drastically reduce the impact of energy infrastructure on vultures (assess mortality due to impact with power lines and wind turbines or electrocution and implement mitigation techniques).

7. Improving the breeding success and sustainability of vultures (protection of nesting habitat, reduction of poaching and disturbance, control of human activities in breeding areas)

8. Reduce direct anthropogenic mortality (institutional and legislative measures to control poaching, taxidermy, and vulture trade).

9. Promote communication of metapopulations (reintroduction of species, enrichment of existing species with individuals born in captivity or coming from Care Centers, increasing genetic diversity through the creation of corridors, facilitating the linking of metapopulations through the operation of Feeding areas for scavenging birds of prey).

10. coordination and implementation of the Action Plans (implementation, assessment, and revision of the Action Plans by country)'.

For all of the above specific objectives, corresponding measures/actions are proposed (see in detail in Annex III List of protection measures and actions of the above deliverable) for the implementation of which each of the WPPs located within the above-protected areas can assist in the implementation of actions to be implemented within these areas, or all of the WPPs located within protected areas in Greece for actions to be implemented in the whole of the Greek territory, following the establishment of a special voluntary financial instrument, under the auspices of the Ministry of Environment and Energy, with each WPP contributing proportionally.

9. Monitoring Program

It is proposed that during the operation of the WPP, the monitoring and recording of its operational impacts be entrusted to qualified personnel who will be regularly present on site and can function as a source of baseline information and continuous baseline observation. This staff should consist of qualified relevant scientists who will monitor the accuracy of the predictions of this study, possible variations in the use of the field research area by the important bird species in the area that may be due to random or currently unforeseeable factors (e.g., the occurrence of a forest fire in the area that would create "open areas") varying the degree of use of the area by the different bird species, the effectiveness. During the monitoring program for avifauna, it is proposed to apply in parallel (if required, based on the above) an appropriate corresponding program for chironomid mammals (limited in time to the period during which the mammal group in question is active, both during the 24-hour period and during the year).

It is recommended that the monitoring and recording of impacts that will be conducted should be at least 4 years and should be conducted both during the preconstruction and construction phases, as well as during the first two years of operation of the project and should include the following:

- Regular surveys (proposed every 15 days, 2 times per month) during critical periods and every 20 days, 3 times per 2 months the rest of the time) related to the risk of collision and the detection of nests in the area.

- Recording of project area land use data and recording of flights of important species in the project area and their interaction with wind turbines.

- Visualization of the above on a map for assessment of the situation.

- Monitoring and recording of mortality in a special protocol to be maintained by the company and available to the relevant departments - agencies for the control of incidents of collisions in the area.

- Training of the workers in the WPP to deal with incidents of injured birds and to inform the competent services - agencies immediately.

- Training of the employees of the WPP to scan the area of the wind turbines for dead birds and control of the correct implementation of the procedure with inspections.

- Assessment of the situation based on the information collected.

Based on the above plan, it will be possible to assess the progress of the operation of the project and determine whether additional measures or modifications to the proposed measures are necessary to minimize any potential impacts.

10. Conclusion Summary

The project under study is located within the protected area of Natura 2000 network SPA GR1110010, as well as within the SPA GR003. It is also adjacent to the Bulgarian protected area of the Natura 2000 network 2000 SPA BG0002019 (distance in a straight line less than 100 m), and is less than 500 metres from the nearest neighbouring SPA GR1130011 and at a distance of more than 20 km from the GR1110002, the protected object of which is the avifauna.

Throughout this study, following a literature review and field observations for the period July 2020 - June 2021, all necessary records and assessments were made to conduct a specified ecological assessment of the project under study in relation to the protected areas. Based on these, **and subject to the condition of implementing all the mitigation measures for potential impacts listed in this SEA (with the grouped priority listed)**, it is assessed that the proposed project:

- It is not likely to delay or interrupt progress towards the conservation objectives of the Natura 2000 sites concerned.

- Not likely to reduce the area or fragment habitat types of Natura 2000 sites or affect the representativeness and degree of conservation of their structure and functions. It is not likely to reduce the area or fragment habitat types of Natura 2000 sites or affect the representative nature and degree of conservation of their structure and functions.

- It is not likely to reduce the size of the population of species or affect the degree of conservation of their habitats or fragment them or affect the balance between species or affect the degree of isolation.
- Not likely to cause changes to vital parameters (e.g., nutrient balance, soil degradation from potential erosion, dynamics of relationships between biotic and abiotic parameters) that determine how Natura 2000 home site's function.
- Not likely to have interactions with predicted or expected natural changes in Natura 2000 residential sites.

The associated works of this WPP project are not considered to have an adverse impact on the site and its integrity, nor on the species living in it due to the proposed undergrounding of the cabling for the transmission of the electricity generated. The new borehole for the installation of the wind turbines is very short and will not cause any adverse effects on the Natura 2000 site and its protected objects, due to the correct sitting (and the relevant proposals herein).

The impacts of the project in association with other related (under permitting) projects in the area are **less than significant** **given that all the mitigation measures identified in this SEA will be implemented.**

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12. Research Team

PROJECT RESEARCH TEAM

Name	Occupation	Object of Study
Aikaterini Psachoula	Forester - Environmental Scientist	Development of the methodology of the surveys and fieldwork in general, field surveys, evaluation and synthesis of the results, drafting of the final study
Athanasios Psarikidis	Forester - Environmental Scientist, M.Sc. Sustainable Management of Environment and Natural Resources	Development of methodology for recordings, coordination of fieldwork, field recordings, evaluation, and synthesis of results, and drafting of the final study.
Maria Kadroudi	Forester	Conducting field recordings

Environmental Consultant of the Project

Aikaterini Psachoula	Forester - Environmental Scientist