SAĞANAK ENERJİ

SAGANAK ENERJI YATIRIM URETIM VE TICARET A.S.

KANDIRA WIND POWER PLANT

BIODIVERSITY ACTION PLAN

DECEMBER 2020

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REVISION HISTORY

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ABBREVIATIONS

AIIB	Asian Infrastructure Investment Bank
BAP	Biodiversity Action Plan
BERN	The Bern Convention on the Conservation of European Wildlife and Natural Habitats
BMP	Biodiversity Monitoring Plan
CBD	Convention on Biological Diversity
CITES	The Convention on International Trade in Endangered Species of Wild Fauna and Flora
COP	Conference of Parties
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMRA	Energy Market Regulatory Authority
ESF	Environmental and Social Framework
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
EU	European Union
IBA	Important Bird Area
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
MoAF	Ministry of Agriculture and Forestry
PS	Performance Standard (of IFC)
RDBTP	Red Data Book of Turkish Plants
UN	United Nations
UNEP	United Nations Environment Programme

1. PURPOSE AND SCOPE

Kandira Wind Power Plant (WPP) ("the Project") will be implemented by Saganak Enerji Yatirim ve Ticaret A.S. ("Saganak", "The Project owner") through wind energy, which is a component of renewable energy sources that are of global importance. The project will have a total installed capacity of 49,8 MWm/49 MWe, which will be provided by a total of 10 wind turbines. Project is located in Kandira district of Kocaeli province of Turkey. It is also an important project in terms of obtaining energy by protecting its resources, natural resources and biological elements.

Biodiversity is the essence of life on earth. The intrinsic value attached to each and every species, habitats they inhabit and ecosystems they flourish is invaluable. The great benefit to humankind, known and unknown, as well as to their fellows, biodiversity components constitute great assets that are in need of protection, in this era of unprecedented development.

Considering the potential impacts on biota, this Biodiversity Action Plan (BAP) was prepared to develop effective strategies for conservation of terrestrial habitats and wildlife in the area. The BAP gathers all existing data on biodiversity around the Project area. Analyses provided in this report further identify priority habitats and species of conservation importance within an ecologically sensible study area.

BAP actions are defined in line with national and international legislation, as well as standards set forth by Saganak in terms of protecting environmental resources. In that sense, the BAP complies with the International Finance Corporation (IFC) Performance Standard 6 in terms of identifying and assessing biodiversity components, as well as adopting a mitigation hierarchy approach along with Asian Infrastructure Investment Bank's (AIIB) Environmental and Social Standard 1 (ESS 1).

One of the crucial points in development and implementation of this BAP is that it is intended to be an open-ended document, which can and should be continuously reviewed, updated and improved based on changes in the area due to proceedings of the Project as well as additional data that may become available.

The implementation of the BAP will also require cooperation of Saganak with other stakeholders, and also dedication of time and effort into adopting an integrated approach tackling complex natural systems of the land.

1.1 Importance of Conserving Biodiversity

The Convention on Biological Diversity (CBD) in its Article 2 defines biological diversity, or biodiversity, as the variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part, this includes biodiversity within species, between species and of ecosystems.

Biological resources around the globe carry not only great intrinsic value but are essential to human development both in social and economic aspects. Biological diversity is considered as an invaluable asset for generations to come by and yet to be conserved with much greater effort today while under unprecedented threat. It is a well-recognized fact that species of various ecosystems are going extinct at such high pace due to continuous anthropogenic impacts. Joint initiatives among different nations of the world resulted in common goals set for countries to adopt based on their own resources and conservation capabilities.

Importance attributed to biodiversity conservation can be appraised related to a variety of different reasons, depending on which perspective one is taking in putting it forward as an essence. CBD notes that "at least 40 percent of the world's economy and 80 percent of the needs of the poor are derived from biological resources". This alone lays down the significance of biodiversity. Yet, with an attempt to not favor one reason over the other, here is a range of ways how biodiversity improves the health and well-being of ecosystems, and thus human beings:

- Ecosystem services
- Agricultural productivity
- Traditional and modern medicines
- Necessities of food, water, shelter, etc.
- Protection against natural catastrophes
- Job market
- Direct economic benefits (eco-tourism)
- Aesthetics and recreation
- Research and education

The list can sure be extended to cover a large array of benefits biodiversity provides through healthy ecosystems all around the globe. Biodiversity is essential for all natural systems to exist and survive. Thus, any intervention with a particular system needs to consider the links between each and every element within, so as not to cause a major malfunction that would put an obstacle to functioning of ecosystems putting biodiversity at stake.

Integrating biodiversity conservation into project management is an important step to prevent loss of habitats and species, as well as their genetic resources. It also opens up a path to explore how development can be harmonized with conservation of biodiversity.

1.2 Objectives of the BAP

The main objective of Kandira WPP BAP is to achieve biodiversity conservation within Kandira WPP Project footprint, with no net loss of biodiversity resulting from the planned project activities. This BAP has been prepared also to put forward necessary actions for short-term changes foreseen within the project area and its vicinity, like impacts during construction, as well as to plan for changes that are medium to long-term (like permanent and operational impacts) so as to cover all bases for biodiversity conservation in the foreseeable future. Accordingly, the following are the issues that are tackled throughout this BAP, with an attempt to conclude an open-ended document that is to be reviewed and updated on a regular basis throughout the course of Kandira WPP Project:

- **Outlining** existing baseline information on all related aspects of biodiversity that can be utilized for developing the BAP strategies and actions
- **Detailing** how stakeholder participation can be ensured during implementation of Kandira WPP BAP
- **Conducting** a Critical Habitat Assessment in line with IFC PS6 requirements and presenting its outcomes to be considered within the scope of this BAP
- **Identifying** priority habitats and species of conservation importance, and related BAP targets to be defined for each
- **Formulating** specific BAP actions to be implemented for biodiversity conservation
- **Developing** a monitoring program and a review process enabling mitigation assessment and corrective action

It is important to recognize that there will be other documents existing in correlation with the BAP, whose particular actions would be closely related to strategies put forward in this document. In this scope Kandira WPP Ornithological Ecological Ecosystem Assessment Report and The National Biological Diversity Strategy and Action Plan (MoAF, 2007) were take in consideration for prepare this BAP.

Accordingly, these documents, and more, have been utilized as references that supplement the information provided and assessments conducted within the scope of this BAP. While previously prepared action plans have been taken into account in terms of complying with

strategies that had been set forth, baseline information was compiled in accordance with data presented in Kandira WPP Ornithological Ecological Ecosystem Assessment Report prepared for the Project.

Considering the variety of BAPs prepared at different scales (eg. national and regional BAPs) as well as those that are more specific in nature (eg. local BAPs or species action plans), Kandira WPP BAP can be categorized as a “Company Biodiversity Action Plan (CBAP)”, standing as an action-oriented corporate framework addressing biodiversity conservation issues within an area, boundaries of which are defined by WPP project characteristics (IPIECA/OGP, 2005).

2. LEGISLATIVE REQUIREMENTS AND STANDARDS

2.1 National Legislation

It is the responsibility of the Ministry of Agriculture and Forestry (MoAF) and its affiliated organizations to formulate policies concerning the conservation of biodiversity in Turkey, designate and manage protected areas under various statuses, to develop and implement plans and programs, to carry out activities in this scope and to ensure coordination among different institutions (National CHM to CBD, n.d.).

The affiliated organizations of the Ministry are the Special Environmental Protection Agency, the General Directorate of Forestry, the General Directorate of the State Meteorological Service, and the General Directorate of State Hydraulic Works. The provincial organization of the MoAF consists of the Provincial Directorates of Agriculture and Forestry, as well as the regional directorates of the affiliated organizations.

The Ministry's unit with primary authority and responsibility for the conservation and sustainable use of biological diversity is the General Directorate of Nature Conservation and National Parks, which is also the CBD focal point. The General Directorate of Nature Conservation and National Parks is the principal unit responsible for the management of protected areas designated under the National Parks Law, for the conservation of wildlife and for the regulation and supervision of terrestrial hunting.

2.1.1 National Laws and Regulations

The Environment Law, dated August 9, 1983 and numbered 2872, aiming at the protection of the environment, the common asset of all living things, in accordance with the principles of sustainable environment and sustainable development, determines and provides for the basic principles related to protecting and improving the environment and preventing its pollution.

Law 5491 of April 26, 2006 amending the Environment Law, states the importance of protecting biological diversity in Article 6 and introduces penal sanctions against damage to the environment, including the destruction of biological diversity, when detected through inspection and audits. The regulations issued on the basis of the Environment Law specify rules on the prevention of pollution and on environmental impact assessment.

The laws and regulations for conservation of habitats and species in Turkey are presented in Table 2.1.

Table 2.1 Laws and regulations on conservation of habitats and species

Turkish Law / Regulation	Official Gazette	
	Date	Date
Law on National Parks	09.08.1983	2873
Law for the Protection of Cultural and Natural Assets	23.07.1983	2863
Decree-Law Establishing the Special Environmental Protection Agency	19.10.1989	383
Terrestrial Hunting Law	01.07.2003	4915
Law on Fisheries	04.04.1971	1380
Forestry Law	31.08.1956	6831
Law for the Protection of Animals	24.06.2004	5199
Regulation for the Protection of Wetlands	17.05.2005	25818
Regulation for Implementing the Convention on International Trade in Endangered Species of Wild Fauna and Flora	27.12.2001	24623

Turkish Law / Regulation	Official Gazette	
	Date	Date
Regulation on the Collection, Production and Exportation of Natural Flower Bulbs	19.07.2012	28358
Regulation on Fisheries	10.03.1995	22223
Regulation on Protection of Wildlife and Wildlife Development Areas	08.11.2004	25637

There are also laws and regulations effective in terms of protecting other environmental components, as well as to minimize pollution and ensure sustainable development and management of natural resources. Legislation on air quality control and management, environmental management and permitting, health and safety, management of chemicals and other dangerous substances, noise control and management, soil quality control, water quality control and management, and waste management, also ensure management of issues that might have secondary impacts on biodiversity components.

2.1.2 National Environmental Plans and Programs

In addition to the international conventions Turkey is a party to, national environmental strategies have been set out through preparation of various plans and programs, which can be listed as the following:

- National Environmental Action Plan (1998)
- National Plan for In-Situ Conservation of Plant Genetic Diversity (1998)
- National Agenda 21 Programme (2001)
- National Wetland Strategy (2003)
- Turkish National Forestry Programme (2004)
- National Science and Technology Policies 2003-2023 Strategy Document (2004)
- Turkish National Action Programme Against Desertification (2005)
- National Environmental Strategy (2006)
- National Rural Development Strategy (2006)
- National Biological Diversity Strategy and Action Plan (2007)

Among these plans and programs the National Biological Diversity Strategy and Action Plan, whose most recent update was completed in 2007, is a response to the obligation to prepare a national strategy for the purpose of guiding the implementation of the Convention on Biological Diversity. The aim of this Strategy is to identify and assess Turkey's biological diversity in brief, to determine a generally agreed strategy for conservation and to propose the actions required for achieving the goals of biological diversity conservation in Turkey. The Strategy is intended "to create a society that lives as part of nature, that values biological diversity that does not consume more than what nature is capable of replacing, and that leaves to future generations a nature rich in biological diversity". The Strategy defines the current legal responsibilities concerning biological diversity, underlines the importance of international cooperation intended for policy-making and the importance of the necessary research conditions to develop ecosystem management, and includes a definition and assessment of Turkey's biological diversity and the strategies and priority action plans towards the goals (MoAF, 2007).

National Threat Statuses for Flora

Plant specimens collected during field surveys were identified using the "Flora of Turkey and East Aegean Islands" (Davis, 1965-1988), while Turkish names of the identified species were compiled using the "Turkish Plant Names" by Prof. Dr. Turhan Baytop (1994). Threat statuses for flora species identified within the biodiversity study area were evaluated according to the

categories and criteria presented in the reference book of Red Data Book of Turkish Plants (RDBTP; Ekim et al., 2000), which was prepared in accordance with the IUCN Red List criteria of 1994. The threat categories provided in this reference book were re-evaluated considering the population of endemic species within the site and also IUCN 2001 criteria.

National Threat Statuses for Fauna

Unlike the RDBTP, which provides an official list for national threat statuses of flora species, there are no officially accepted nationwide threat lists established for fauna species. The references provided in this section are utilized to provide some form of evaluation, but as presented in the upcoming chapters of this report, they do not provide adequate information to make thorough assessments when it comes to critical and higher priority habitats and species.

Kiziroglu, I. (2009). The Pocket Book for Birds of Turkiye

Birds of the biodiversity study area were also assessed according to national threat categories defined in The Pocket Book of Birds of Turkey (Kiziroglu, 2009) within the categories defined in Table 2.3.

Table 2.1 National threat categories for bird species

Category A		
A.1.2	**(CR)**	Critically endangered and breeding species in Turkey
A.2	**(EN)**	Endangered and breeding species in Turkey
A.3	**(VU)**	Vulnerable and breeding species in Turkey
A.3.1	**(D)**	Declining, vulnerable and breeding species in Turkey
A.4	**(NT)**	Near threatened, breeding species do not face to risk now but are likely to qualify for threatened category in the near future in Turkey
A.5	**(LC)**	Least concern, breeding species that are widespread in Turkey
A.6	**(DD)**	Data deficient, breeding species on which there is deficient information in Turkey
A.7	**(NE)**	Not evaluated, Breeding species which have not been evaluated in Turkey
Category B		
B.1.2	**(CR)**	Critically endangered and non-breeding species in Turkey
B.2	**(EN)**	Endangered and non-breeding species in Turkey
B.3	**(VU)**	Vulnerable and non-breeding species in Turkey
B.3.1	**(D)**	Declining, vulnerable and non-breeding species in Turkey
B.4	**(NT)**	Near threatened, non-breeding species do not face to risk now but are likely to qualify for threatened category in the near future in Turkey
B.5	**(LC)**	Least Concern, non-breeding species that are widespread in Turkey
B.6	**(DD)**	Data deficient, non-breeding species on which there is deficient information in Turkey
B.7	**(NE)**	Not Evaluated, non-breeding species which have not been evaluated in Turkey

2.2 International Standards

2.2.1 International Regulatory Framework

In conducting biodiversity studies within the Project site and evaluating terrestrial flora and fauna survey results, both national and international legislation, as well as standards and guidelines were taken into consideration. Turkey is a party to a number of conventions on different aspects of biological diversity, which are listed below are also part of national legislation. Although, not all of the listed conventions are directly within the scope of this Project, it is worth putting forth the binding framework for any project undertaken in Turkey:

- UN Convention on Biological Diversity (CBD) (1997) and the Cartagena Protocol on Biosafety (2004)

- UN Framework Convention on Climate Change (UNFCCC) (2004)
- Vienna Convention for the Protection of the Ozone Layer (1988) and the Montreal Protocol on Substances Depleting the Ozone Layer (1990)
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (1994)
- UN Convention to Combat Desertification (CCD) (1998)
- Convention on Wetlands of International Importance, Especially as Waterfowl Habitat (RAMSAR) (1994)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (1996)
- Convention for the Protection of World Cultural and Natural Heritage (1983)
- International Convention for the Prevention of Marine Pollution from Ships (MARPOL)(1990)
- International Convention on Plant Genetic Resources for Food and Agriculture (2006)
- Convention on Long-Range Transboundary Air Pollution and the Cooperative Programme for Monitoring and Evaluation of the Long-Range Transmissions of Air Pollutants in Europe (EMEP) (1983)
- Convention for the Conservation of European Wildlife and Natural Habitats (BERN) (1984)
- European Landscape Convention (2001)
- The Convention for the Protection of Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention) (1981) and its protocols including the Protocol on Special Protected Areas and Biological diversity in the Mediterranean (1988)
- Convention for the Protection of the Black Sea Against Pollution (Bucharest) (1994) and its protocols including the Protocol for the Protection of Biological and Landscape Diversity in the Black Sea (2004)

2.2.2 Convention on Biological Diversity (CBD)

Amongst the conventions listed in Section 2.2.1, the United Nations Convention on Biological Diversity sets the stage for this document in hand, in terms of not only providing a globally recognizable definition of biological diversity but also defining clear strategies on conservation of biodiversity that are to be addressed within the scope of Kandira BAP process. It is therefore worth elucidating on the Convention, more than any other, at this point in time, and Turkey's response at a national level.

The United Nations Environment Programme (UNEP) convened the Ad Hoc Working Group of Experts on Biological Diversity in November 1988 to explore the need for an international convention on biological diversity. Soon after, in May 1989, it established the Ad Hoc Working Group of Technical and Legal Experts to prepare an international legal instrument for the conservation and sustainable use of biological diversity. The experts were to take into account "the need to share costs and benefits between developed and developing countries" as well as "ways and means to support innovation by local people". By February 1991, the Ad Hoc Working Group had become known as the Intergovernmental Negotiating Committee. Its work culminated on 22 May 1992 with the Nairobi Conference for the Adoption of the Agreed Text of the Convention on Biological Diversity. The Convention was opened for signature on 5 June 1992 at the United Nations Conference on Environment and Development (the Rio "Earth Summit"). It remained open for signature until 4 June 1993, by which time it had received 168 signatures. The Convention entered into force on 29 December 1993, which was 90 days after the 30th ratification. The first session of the Conference of the Parties was scheduled for 28 November – 9 December 1994 in the Bahamas (CBD, 2014). Turkey ratified the Convention in 1996, and since then prepared four National Reports on Biological Diversity, the latest of which is dated 2007.

In year 2010, the Conference of Parties (COP) of the Convention adopted a revised and updated Strategic Plan for Biodiversity, which also included the Aichi Biodiversity Targets for the

period of 2011-2020. The targets provide a framework for action by all stakeholders to save biodiversity and enhance its benefits for people (CBD, 2014):

- Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
- Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use
- Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity
- Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services
- Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building

2.2.3 The European Union (EU) Legislation

The European Union (EU) environmental legislation, in the most general sense, is set forth to ensure protection of air and water quality, conservation of resources and protection of biodiversity, waste management and control of activities which can have an adverse environmental impact, at both Member State level and internationally. Since the mid-1970s, EU environmental policy has been guided by action programmes defining priority objectives to be achieved over a period of years. The latest of these programmes was adopted by the European Parliament and the Council of the European Union in November 2013 and extends until the year 2020 (EC, 2014b). The EBRD environmental and social policy requires projects financed by the EBRD to be tailored to meet the objectives of the relevant EU directives.

Protection of biodiversity is one of EU's key objectives, besides all other areas of environmental legislation. The Biodiversity Strategy for 2020 was adopted to protect and improve the state of biodiversity in Europe for the next decade. It identified six targets, which covers different aspects of biodiversity loss:

- Target 1: conserving and restoring nature
- Target 2: maintaining and enhancing ecosystems and their services
- Target 3: ensuring the sustainability of agriculture and forestry
- Target 4: ensuring sustainable use of fisheries resources
- Target 5: combating invasive alien species
- Target 6: addressing the global biodiversity crisis

Although not an EU Member State, Turkey has a set program for alignment with the EU Acquis, which comprises more than 200 major legal acts covering horizontal legislation, water and air quality, waste management, nature protection, industrial pollution control and risk management, chemicals and genetically modified organisms (GMOs), noise and forestry. A number of regulations have been adopted, yet there is a rather long way for Turkey to achieve in the field of biodiversity and nature protection.

Action 7 under Target 2 of the EU Biodiversity Strategy to 2020 seeks to 'ensure no net loss of biodiversity and ecosystem services'. It is composed of two complementary sub-actions. Action 7a foresees that, 'in collaboration with the Member States, the Commission will develop a methodology for assessing the impacts of EU funded projects, plans and programmes on biodiversity by 2014' (EC, 2014b).

The Birds Directive (2009/147/EC)

Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (this is the codified version of Directive 79/409/EEC as

amended). This Directive ensures far-reaching protection for all of Europe's wild birds, identifying 194 species and sub-species among them as particularly threatened and in need of special conservation measures. There are a number of components to this scheme (EC, 2014a):

- Member States are required to designate Special Protection Areas (SPAs) for 194 particularly threatened species and all migratory bird species listed in Annex I of the Birds Directive. SPAs are scientifically identified areas critical for the survival of the targeted species, such as wetlands. They are part of the Natura 2000 ecological network set up under the Habitats Directive 92/43/EEC.
- A second component bans activities that directly threaten birds, such as the deliberate killing or capture of birds, the destruction of their nests and taking of their eggs, and associated activities such as trading in live or dead birds (with a few exceptions).
- A third component establishes rules that limit the number of bird species listed in Annex III, which can be hunted (82 species and sub-species) and the periods during which they can be hunted. It also defines hunting methods which are permitted (e.g. non-selective hunting is banned).

Table 2.2 Annexes to the Birds Directive

Annex	Explanation
I	Species subject to special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution
II	Species may be hunted under national legislation. Member States shall ensure that the hunting of these species does not jeopardize conservation efforts within their distribution area
III	Species whose sale, transport for sale, keeping for sale and the offering for sale of live or dead birds and of any readily recognizable part or derivatives of such birds is not prohibited provided that the birds have been legally killed or captured or otherwise legally acquired.

The Habitats Directive (92/43/EEC)

The Habitats Directive 92/43/EEC was adopted in 1992. The main aim of this Directive is to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements. While the Directive makes a contribution to the general objective of sustainable development; it ensures the conservation of a wide range of rare, threatened or endemic species, including around 450 animals and 500 plants. Some 200 rare and characteristic habitat types are also targeted for conservation in their own right (EC, 2014a).

The Habitats Directive (together with the Birds Directive) forms the cornerstone of Europe's nature conservation policy. It is built around two pillars: the Natura 2000 network of protected sites and the strict system of species protection. All in all the directive protects over 1,000 animals and plant species and over 200 so called "habitat types" (e.g. special types of forests, meadows, wetlands, etc.), which are of European importance.

Annexes I and II to the Directive contain the types of habitats and species whose conservation requires the designation of special areas of conservation. Some of them are defined as "priority" habitats or species (in danger of disappearing). Annex IV lists animal and plant species in need of particularly strict protection at national level (see Table 2.4).

Table 2.3 Annexes to the Habitats Directive

Annex	Explanation
I	Natural habitat types of community interest whose conservation requires the designation of special areas of conservation
II	Animal and plant species of community interest whose conservation requires the designation of special areas of conservation
III	Selection criteria for areas that are important for the community and suitable to be declared a special area to be protected
IV	Animal and plant species of community interest in need of strict protection
V	Animal and plant species of community interest whose taking in the wild and exploitation may subject to management measures

2.2.4 IFC Performance Standard 6

International Finance Corporation (IFC) is the lower arm of World Bank Group and provides financial support to private sector. In the projects, which they are funding, they implement the Performance Standards (PS) in order to manage social and environmental risks and impacts. PS 6 covers areas of biodiversity conservation, ecosystem services and sustainable management of living resources, which are all fundamental to achieve sustainable development. Accordingly, the objectives of PS 6 are outlined as the following (IFC, 2012):

- To protect and conserve biodiversity.
- To maintain the benefits from ecosystem services.
- To promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.

Within the scope of IFC PS 6, it is important to evaluate ecosystem services that a particular site offers, which include “benefits that people, including businesses, derive from ecosystems”. Accordingly, IFC defines four types of ecosystem services, which have been assessed as part of this BAP (IFC, 2012):

- Provisioning services, which are the products people obtain from ecosystems
- Regulating services, which are the benefits people obtain from the regulation of ecosystem processes
- Cultural services, which are the non-material benefits people obtain from ecosystems
- Supporting services, which are the natural processes that maintain the other services

IFC requires that a project owner carries out a systematic review to identify priority ecosystem services, which are referred to as an Ecosystem Services Review (ESR). For the purposes of PS 6 implementation and the ESR, ecosystem services are categorized as two types (IFC, 2012: 42):

- **Type I:** Provisioning, regulating, cultural and supporting ecosystem services, over which the client has direct management control or significant influence, and where impacts on such services may adversely affect communities.
- **Type II:** Provisioning, regulating, cultural and supporting ecosystem services, over which the client has direct management control or significant influence, and on which the project directly depends for its operations

2.2.5 AIIB Environmental and Social Standard 1

The Asian Infrastructure Investment Bank (AIIB) is an international organization that provides a multilateral regional financing and investment platform for infrastructure development and enhanced interconnectivity in Asia. The AIIB implements the Environmental and Social Standards (ESSs) which are described under the Environmental and Social Framework (ESF) of the bank. The purpose of these ESSs is to ensure the environmental and social soundness and sustainability of Projects and to support the integration of environmental and social considerations into the Project decision-making process and implementation. ESS 1 covers the topics related with the biological aspects of the Projects. The main topics listed in the ESS 1 is listed below;

- Biodiversity Consideration,
- Biodiversity Impacts,
- Critical Habitats,
- Natural Habitats,
- Protected Areas.

2.2.6 Bern Convention

Bern Convention was put forward in 1982 in order to protect the European wildlife and natural habitats. Species to be protected according to the Bern Convention are listed in four appendices, which are presented in Table 2.5 with their explanations:

Table 2.2 Annexes to the Bern Convention

Annex	Explanation
I	Strictly protected flora species
II	Strictly protected fauna species
III	Protected fauna species
IV	Prohibited means and methods of killing, capture and other forms of exploitation

The Convention aims at conserving and promoting biodiversity, developing national policies for the conservation of wild flora and fauna and their natural habitats, protection of the wild flora and fauna from the planned development and pollution, developing trainings for protection practices, promoting and coordinating the researches made regarding this subject. It has been signed by 26 member states of the European Council (as well as Turkey) with the aim of conserving the wild life in Europe. Species that are not included within the appendices of the Convention are those that do not require any special protection. Species are not listed individually but instead are protected due to the habitat protection approach of the Bern Convention. All of the nations, which are party to the BERN Convention, have signed the Convention on Biological Diversity as well. Parties of this convention are responsible from ensuring sustainable use of resources in line with their national development trends and conserving the threatened species.

2.2.7 CITES

CITES stands for the Convention on International Trade in Endangered Species of Wild Flora and Fauna. It is an international agreement that has been ratified by governments of 164 states (including Turkey), whose aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. The principles of CITES are based on sustainability of the trade in order to safeguard ecological resources (live animals and plants, vast array of wildlife products derived from them, including food products, exotic leather goods, etc.). CITES was signed in 1973 and entered in force on July 1, 1975. Turkey ratified the Convention in 1996. Categories and species included in CITES are listed in three different appendices based on their protection statuses. These appendices and their explanations are given in Table 2.6.

Table 2.4 Appendices to CITES

Appendix	Explanation
I	covers the species, which are under the threat of extinction. Trade in the specimens of these species is not allowed except extraordinary circumstances
II	includes species, which are not threatened with extinction, but trade in specimens is restricted in order to prevent utilization incompatible with their survival
III	for which other parties of CITES is applied for assistance in controlling trade and which are conserved at least in one country.

2.2.8 IUCN Red List of Threatened Species

The International Union for Conservation of Nature (IUCN) publishes its Red List of Threatened Species, which intends to draw attention to species whose populations are at risk or under threat. The IUCN places a species on the Red List only after studying its population and the reasons for its decline. Some countries pay greater attention to IUCN-listed species than Bern-listed species, since the Red List relies on more research. The 1994 (ver.2.3) and 2001 (ver.3.1) categories and criteria of the IUCN Red List are presented below in Table 2.7. The Red List

Categories and Criteria had been re-formed through evaluating more open and easier to use systems. As a result the IUCN Commission made revisions in February 2000, and the new set of categories and criteria were published in 2001.

Table 2.5 IUCN Red List Categories and Criteria

IUCN Red List Categories and Criteria 1994 (ver. 2.3)		**IUCN Red List Categories and Criteria 2012 (ver. 4.0)**	
EX	Extinct	EX	Extinct
EW	Extinct in the Wild	EW	Extinct in the Wild
CR	Critically Endangered	CR	Critically Endangered
EN	Endangered	EN	Endangered
VU	Vulnerable	VU	Vulnerable
LR	Lower Risk	LR	Lower Risk
	cd : conservation dependent		cd : conservation dependent
	nt : near threatened		nt : near threatened
	lc : least concern		lc : least concern
DD	Data Deficient	DD	Data Deficient
NE	Not Evaluated	NE	Not Evaluated

In determining threat statuses of flora species identified within the study area Red Data Book for Turkish Plants (Ekim et al., 2000), which was prepared in accordance with 1994 IUCN Red List Categories and Criteria was utilized.

3. ROLES AND RESPONSIBILITIES

In this section, the capacity to implement BAP and which actions to follow are explained. In order to successfully implement the action plans, the Project owner will assign the following qualified employees to be responsible for addressing and managing biodiversity issues.

Project Manager: To monitor implementation of the Saganak standards, review the BAP and to ensure successful implementation of the BAP.

HSE-Q Expert: Responsible for the implementation of biodiversity conservation activities and the implementation of BAP actions, identifying in which locations the sensitive ecosystems and protected areas and species are negatively affected by what activities.

Expert Consultants: Must conduct additional surveys, assess the results and integrate them into the BAP whenever necessary, apply monitoring strategies and inform Saganak any additional measure that would be required within the scope of the BAP.

4. BIODIVERSITY ACTION PLAN PROCESS

4.1 Biodiversity Study Area

In the Ornithological Ecological Ecosystem Assessment Report prepared for the Kandira WPP Project, the biodiversity study area of the Kandira WPP area has been determined. The study area, within the scope of the planned project, has been determined and evaluated as the sites where the wind turbines will be installed, the project license area, and outside areas (impact area). The map showing the study area is shown in Figure 4.1.

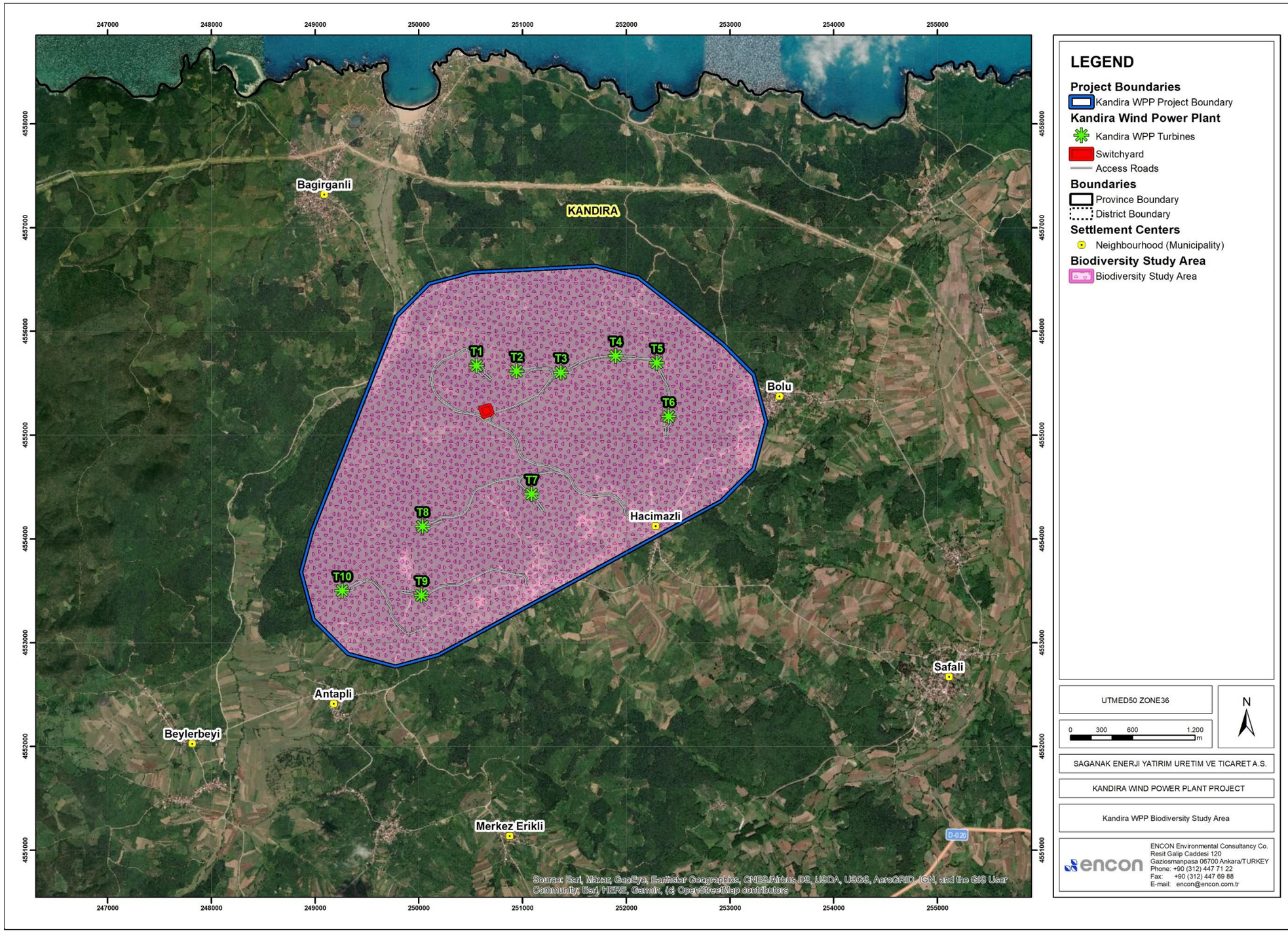

Figure 4.1 Kandira Biodiversity Study Area

4.2 Evaluation of Habitats and Species/Establishing a Biodiversity Database

Data acquired through previous research conducted within Kandira WPP project site and its vicinity, an area which yields a meaningful research unit for biodiversity studies, was re-evaluated within the scope of BAP process in order to achieve objectives of the BAP.

It is important to note here that, a similar approach will be taken throughout the course of the Project, as activities proceed and more information becomes available regarding the status of terrestrial biodiversity in the area, especially in terms of ecosystem and wildlife response to project-induced changes. Consequently, a biodiversity database is established so that actions defined as part of the BAP could benefit vitality of ecosystems and wildlife.

4.3 Setting Target and Indicators

BAP targets and indicators for each habitat and species identified are defined in the action plan in line with conservation priorities and objectives. While objectives in broader sense are set for conservation of biodiversity, related targets expressed in each action plan are formulated to set out specific actions to be taken to ensure successful implementation of the BAP. Indicators, on the other hand, put forward measurable variables that will be monitored to assess success of BAP actions over time, through implementation of the monitoring program.

In order for related assessments to be practical and BAP to be effective in terms of its implementation, actions specified and specific units of implementation were determined to be ecologically sensible considering time constraints and available resources. Yet, in the event that circumstances change over different phases of the Project, possibilities for further actions can be considered.

4.4 Mitigation Assessment

Biodiversity conservation actions are developed in line with IFC PS 6, which targets “no net loss” of biodiversity, through adopting a mitigation hierarchy approach. Accordingly, to realize this BAP and implement it successfully, without any compromises to natural habitats and wildlife species, the mitigation assessment was conducted based on the mitigation hierarchy presented in Figure 4.2.

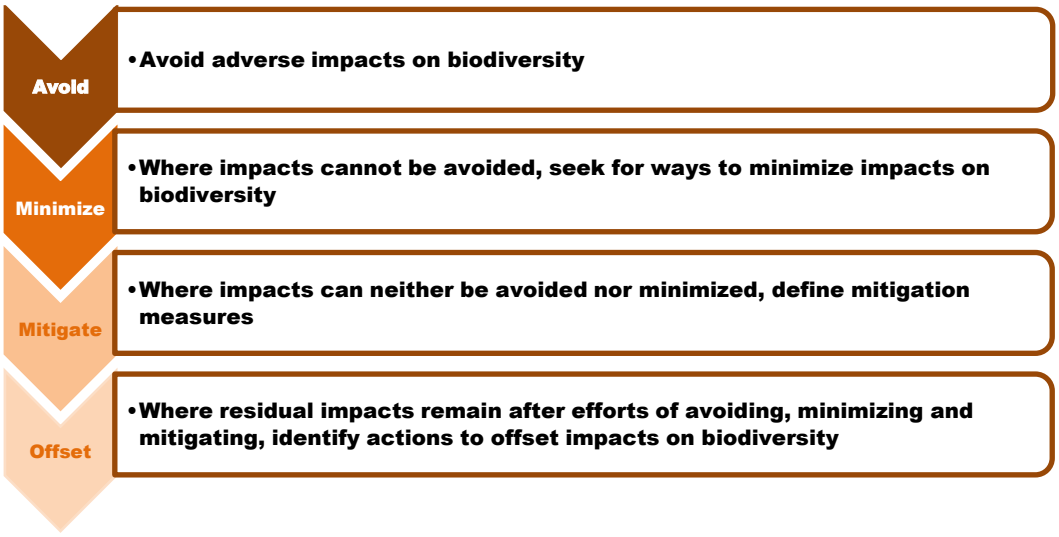

Figure 4.2 The Mitigation Hierarchy

4.5 Implementation of the BAP

Once the targets are set for habitats and species of the BAP, actions to deliver the plan are outlined. Implementation of these actions require coordination of Kandira WPP project activities so as to comply with objectives of the BAP, as well as cooperation of Saganak with stakeholders that might have interest in the implementation of the BAP.

Potential interested people and organizations can be listed as the following:

- Individuals (e.g. villagers and land owners)
- Families and households (e.g. long-term residents as well as extended relatives)
- Community-based groups (e.g. neighborhood associations)
- Local traditional authorities (e.g. village council of elders)
- Local political authorities (e.g. village headman)
- Local governance structures (e.g. administration, police, judicial system, etc.)
- Local governmental agencies (e.g. forestry, environment, water works, etc.)
- Non-governmental organizations
- Universities and research centers
- Businesses and commercial entities

The list can be extended considering there might be other stakeholders willing to get involved as Kandira WPP Project proceeds. Due to time limitations to this study no official consultation activities have been held. Yet, Saganak will be engaged in organizing meetings with stakeholders during the implementation of the BAP. A meeting will be organized and announced so that all interested stakeholders will have a platform to convey their comments and raise questions, all of which will be addressed by Saganak. The date and venue for the meeting is yet to be determined.

One of the key steps to successful implementation of the BAP and achieving its targets to first raise awareness amongst the closest parties to the Project, namely construction and operation staff, as well as residents of nearby villages, in terms of the importance of priority habitats and species identified. Information disclosure and participation would allow the BAP to become a more effective and sustainable document that can be continuously updated through input from various sources. It should, however, be noted that to some stakeholders the very issue of participation might be new. Conservation of biodiversity can also become a reason for conflict if related actions and measures are not explained in full detail. It would require time and commitment to resolve such issues and implement the BAP through a working participatory process.

IPIECA/OGP (2005) in its guide outlines the following actions as necessary for successful implementation of the BAP:

- In collaboration with stakeholders, identify the role of lead organizations, partners, landowners and others in delivering the actions. Each BAP should identify a lead organization that is responsible for the delivery of individual actions, with partners as appropriate.
- Undertake the appropriate level of integration of the site BAP into existing company processes.
- Prevent, minimize, or (as a last choice) offset impacts as appropriate.
- Consider opportunities for biodiversity conservation enhancement beyond simply addressing predicted or existing impacts.

Implementation of the BAP may bring about further opportunities to associate actions related to biodiversity components to other environmental and social aspects of the Project. This would create a potential for Saganak to adopt a more integrated approach and continuously improve the contents of this report.

5. BIODIVERSITY BASELINE

5.1 Methodologies for Biodiversity Baseline Surveys

The first terrestial flora and fauna studies for the Kandira WPP Project were carried out within the determined study area in the scope of Ornithological Ecological Ecosystem Report studies. In this scope, flora and vegetation characteristics of the area, terrestial fauna (reptiles, amphibians, mammals), birds and bats were investigated. The biodiversity studies are based on field studies conducted by experts, related literature reviews and other studies that were carried out previously in the area.

Flora and Vegetation-Fauna Studies

In order to determine the flora species and floral structure of the project area, the protection status of these species and the risks on the species and the protection measures to be taken field study was carried out on 13-14 June 2020. During the field studies, plant samples were taken from the area. These collected wet plant samples were dried in accordance with the herbarium technique. In identification of dried plant samples, "Flora of Turkey And East Aegean Islands" was used. The identified plant species are given in Table 5.2. In the first, second and third columns; family, taxon and Turkish name of the plant are given, respectively. In determination of the Turkish names of the plants, "Great Plants Guide" prepared by Şinasi Akalın and "Turkish Plant Names" prepared by Prof. Dr. Turhan Baytop were used. The hazard category of the taxon is given in the sixth and last column of the table. In determination of hazard categories of plants, the criteria determined by the IUCN commission and "Red Data Book of Turkish Plants" prepared by Ekim et al. and published by Turkey Nature Protection Association were used.

Mammal, Reptile and Amphibian Studies

In the project area, impact area and the terrestrial ecosystem it is in, data were collected by a vertebrate expert, in addition, one-on-one interviews were made with local residents and hunters. In addition, the data of previous studies performed in the project area and ecosystem areas by various researchers on terrestrial vertebrates were also evaluated. Data from vertebrates' hair, traces, feces, photographs, sounds and skin obtained from field studies were used to determine the species living in the area. The results obtained from these studies were evaluated together with the existing literature, thus, the Vertebrate Fauna existing in the area was determined. The literature used in the identification of the species in the projet area is given in references section.

As a result of the field and literature studies, terrestrial vertebrate species living in the project area were determined, and tables were created to determine the national and international danger / protection status of the identified species. Evaluation was made based on European Red List determined by IUCN (International Union for Conservation of Nature), and it is given in the tables with the standard symbols used in the lists. In addition, the terrestrial vertebrate species determined in the study areas are evaluated according to the supplementary lists prepared by the EU Habitats Directive for fauna and are given in the group tables.

Avifauna Studies

The main purpose of the Avifauna baseline studies is to collect sufficient data to understand the interactions between the identified bird species and the planned wind turbines and to identify appropriate mitigation measures and mitigation strategies. For this reason, field studies were conducted within the scope of the Ornithology Report prepared for the Project, and the relevant literature and previous studies conducted in the field were examined. The Ornithology Report was used in the sections of the BAP report on birds.

The following principles and methods were taken as basis in the ornithology studies conducted for the purpose of determining the effects of the construction and operation of the project on the wild bird populations and evaluating this region in terms of bird migration routes.

Fields where ornithological studies are carried out

In ornithology field studies,

- Within the scope of the planned project, the previously determined sites where wind turbines will be installed,
- The sites within the project license area, however, outside of the areas where wind turbines will be installed (impact area),
- The areas with similar / suitable habitats where bird species can mitigate from the project area and impact area due to habitat losses and disturbances that may occur during the construction and operation phases of the project are considered and evaluated as “alternative areas”.

Data collection techniques applied in ornithological studies

The following studies were carried out to determine bird species, population densities and biological activities in the above-mentioned areas:

- Records were kept by making "direct bird species observations" in the mentioned areas. In these areas, birds in different habitat types were observed using "point observation-count" and birds were observed by using "transect observation-count" techniques in transition zones between these different habitats, and their species were identified and recorded (Biby et al 1985).

- “Survey studies with local people” was conducted in these fields and villages in the immediate vicinity. During these survey studies, using “illustrated guide bird books”, information was collected from the locals about the birds seen in these areas and, the presence of bird species observed and gliding in the area especially during the migration period (April-September). Data were collected by carrying out "literature studies", especially scientific reports and research articles with previous ornithological observations in the fields close to these areas.

Periods of ornithological studies and performed ornithological studies

In order to determine the effects of the construction and operation of the project and to evaluate the region in terms of bird migration routes, the migration periods of birds when their biological activies are most dense were taken as basis and active field studies were carried out to obtain data on the ornithological situation. Therefore, field studies were conducted at the project sites in March 2020 and ornithological data were collected and evaluated. In this context, birdwatching records made by us in this region in the past years, especially during breeding and migration periods (April-May-September-October), were also considered, and these records were evaluated especially in terms of migratory birds and migration routes.

Tools that are used in ornithological studies

- During the ornithological studies, 1 / 25.000 scaled geographical maps were used where the project sites and wind turbines were processed. In addition, Garmin brand GPS was used to determine elevations and geographical coordinates during mapping studies.

- Nikon (16x24 mm) brand binoculars and Nikon brand (20-80 x 80 mm) monocular telescope were used during the field studies to observe the birds and to identify at species level. In addition, a Canon brand (7D-II) camera and a Canon brand (100-400 mm) tele-lens were used to photograph the observed bird species and habitats. At the project sites, exploration was made by 4x5 off-road car and ornithologically important areas were determined.

Methods that are used in ornithological studies

- During the identification of the birds in the project areas at the species level, no hunting-gathering (catching with net)-killing was done. During bird observations, advanced optical instruments were used directly. The guidebook was also used for species identification of the observed birds (source: Heinzel et al. 1995).

- All the project sites, especially the areas determined as ornithologically important, and the alternative areas in the immediate vicinity were visited on foot. During these studies, birds were observed using "point observation-count" and birds were observed by using "transect observation-count" techniques in transition zones between these different habitats, and their species were identified and recorded. Bird sounds were also used in identification of species. Field work started in the early morning hours and continued until sunset (Biby et al 1985). In addition to observing individuals of bird species, traces and signs such as nests, feathers, footprints, remains of dead individuals, feces and food residues (Brown et al., 2009) were searched and the findings were recorded.

Record and evaluation method of data obtained in the ornithological studiesi

As a result of the studies, the bird species detected in the project sites was listed. The following information about the bird species included in these bird species lists prepared has been entered into the tables and the findings have been evaluated separately in terms of the ornithological value of the area.

- Scientific systematic categories of bird species (Team and Family),
- Latin and Turkish names of bird species,
- Data acquisition method-source (observation, questionnaire, literature)
- Danger and protection status of bird species on an international scale,
    - According to the World Union for Conservation of Nature-Red List, (IUCN-Red List),
    - According to the BERN Agreement-Global Protection Statuses, (Bern Convention),
- National danger status and categories of bird species,
- It has been determined according to the decisions of the Ministry of Agriculture and Forestry, Central Hunting Commission (M.A.K. 2019-2020).
- Seasonal status of bird species (native, migratory) was determined according to Kiziroğlu, 2009.
- The abbreviations used for the information given on bird species in the prepared inventory lists are shown below.

5.2 Biodiversity Baseline Studies

5.2.1 Protected Areas and Recognized Areas

The World Union for Conservation of Nature and Natural Resources (IUCN, 2017; IUCN, 2008) proposes the following definition for a protected area, which is used globally today.

“A protected area is a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values.”

Doğa Derneği published an inventory of Key Biodiversity Areas (KBA) in Turkey analyzing a total of 472 sites from different regions of the country (Eken et al., 2006). The study was conducted in collaboration with then the Ministry of Agriculture and Forestry, as well as other non-government organisations, civil society, academicians and researchers, both from Turkey, and other countries.

The preparation of the inventory was the first time the KBA approach was applied at a national scale, which was based on principles developed by BirdLife International for bird species in their “Important Bird Areas” studies. One of the fundamental functions of the inventory is defined as “providing resource for areas and species that should be worked upon to reach zero extinction” (Eken et al., 2006, p.23). The inventory still stands as an important guidance in Turkey, due to its wide coverage of terrestrial and aquatic natural systems and detailed lists of species.

Kocaeli Kandira Seyrek wildlife development area (WDA) is located at a distance of 4.2 km to the west of the project area. Kocaeli Kandira Seyrek WDA Karaca was established on 16.10.2005 in an area of 1019.46 ha and the resource value is Karaca = *Capreolus capreolus*. The reason for the registration of the area is that the roe deer, which are naturally few in number, can rapidly develop and spread to the surrounding forests following the intense protection and care measures to be taken, and if their number exceeds the field carrying capacity, it can be regularly offered to domestic and foreign hunting tourism.

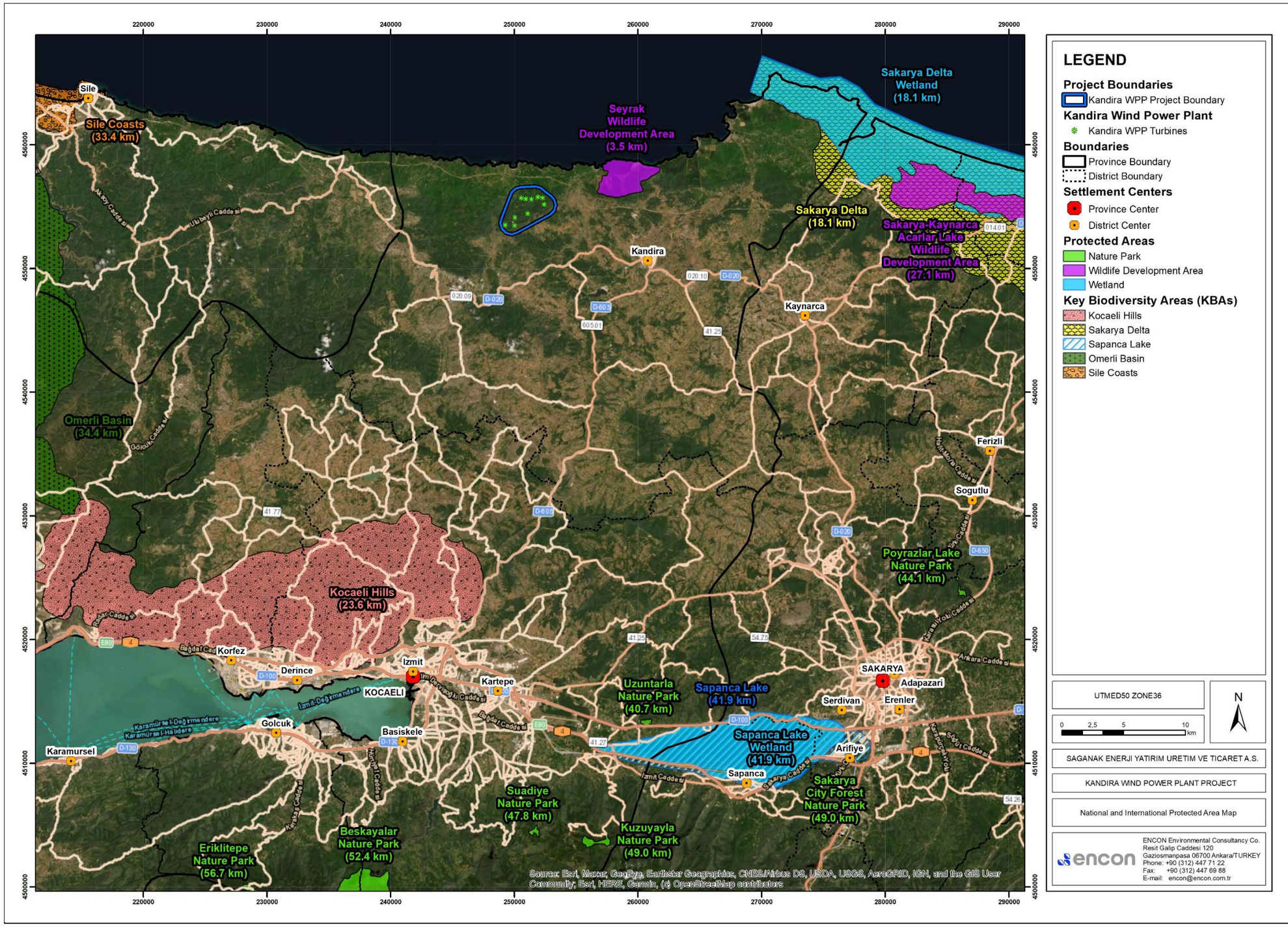

Figure 5.1National and International Protected Areas Map

5.2.2 Flora and Vegetation

The dominant vegetation structure was determined in the field study carried out in the Kandira WPP project area. In project area;

- Two different structures including forest vegetation and,
- Agricultural Areas were determined.

The vegetation structure of the locations of the turbines that are planned to be installed in the Kandira WPP project area is given in Table 5.1

Table 5.1 Dominant Vegetation Character of the Turbine Areas

Turbine No	Dominant Vegetation
T1	Forest Vegetation
T2	Forest Vegetation
T3	Forest Vegetation
T4	Forest Vegetation
T5	Forest Vegetation
T6	Forest Vegetation
T7	Forest Vegetation
T8	Forest Vegetation
T9	Forest Vegetation
T10	Forest Vegetation
Switch Site	Forest Vegetation

Forest Vegetation

Kandira *Project* site forest vegetation is composed of T1, T2, T3, T3, T4, T5, T6, T7, T8, T9, T10 ve switch site forest vegetation. The dominant forest vegetation types are *Fagus orientalis Lipsky,* Quercus frainetto *Ten.,* Quercus pubescens *Willd. In addition,* Phillyrea latifolia *L,* Clematis viticella *L,* Mespilus germanica *L,* Salix caprea *L,* Tilia argéntea *Dest. Ex DC.,* Asparagus acutifolius *L,* Gagea villosa *(Bieb.) Duby var.* villosa *(Bieb.) Duby*, Ruscus aquelatus *L. var.* angustifolius, Phalaris paradoxa *L,* Smilax excelsa *L,* Digitalis ferruginea *L,* Rubus discolor *Weihe et Nees,* Prunella vulgaris *L,* Hypericum avicullariifolium *Jaub et Spach subsp. b*yzantium *(Azn.) robson,* Vicia sativa *L. subsp.* sativa *L,* Trifolium campestre *Schreb. subsp.* campestre *var.* campestre, Lotus corniculatus *var.* corniculatus *L,* Lathyrus sphaericus *Retz.,* Genista lydia *Boiss. var.* lydia *Griseb.,* Galega officinalis *L, Euphorbia stricta L,* Rhodendron luteum *L,* Erica arbórea *L, Carpinus betulus L, Calystegia sepium L. subsp.* sepium *(L.) R. Br. ve Hypericum calycinum L.* were identified.

Agricultural Areas

In Kandira WPP Project site, agricultural lands were determined within the impact area of the Project site. In agricultural lands *Corylus avellana* L. var. *avellana* L. (Hazelnut) is observed as the dominant specie (Figure 26). In these areas; *Convolvulus arvensis* L, *Thlaspi perfoliatum* L., *Rapistrum rugosum* (L.) Ali., *Raphanus raphanistrum* L., *Descurainia sophia* (L.) Webb ex Prantl, *Capsella bursa-pastoris* (L.) Medik., *Taraxacum scaturiginosum* G. Hagl, *Sonchus asper (*L.) Hill subsp. *glaucescens* (Jordan) Ball, *Crepis foetida* L. subsp. *commutata* (spreng.), *Conyza canadensis* (L.) Cronquist, *Torilis japonica* (Houtt.) DC., *Torilis arvensis* (Huds.) Link subsp. *arvensis, Tordylium apul um* L., *Amaranthus retroflexus* L, *Trifolium arvense* L. var. *arvense, Erodium cicutarium* (L.) L'Herit. subsp. *cicutarium* (L.) L'Herit., *Teucrium polium* L. were observed.

Floristic Analysis

It is planned to establish and operate the "Kandira WPP Project" within the borders of Kocaeli Province, Kandira District by SAGANAK Enerji Yatirim Uretim ve Tic. A.S. Construction and operation of Kandira WPP Project, (49.8 MWm / 49 MWe) [(2 x (5.3 MWm / 4.9 MWe)) + (8 x (4.9 MWm / 4.9 MWe)] is planned. As a result of the evaluation of 10 turbine areas to be established and their impact limits; 85 genera, 98 species, 6 subspecies and 5 varieties belonging to 38 families have been identified. The distribution of plants identified in this area according to phytogeographical regions is as follows; Mediterranean element (21 species), Euro-Siberian. element (19 species) and Euxin element (1 species). On the other hand, 57 species are either determined as unknown phytogeographical region or more than one phytogeographical region element. Two endemic species were determined in Project area. These species are; *Hypericum avicullariifolium* Jaub et Spach subsp. b*yzantium* (Azn.) robson and *Anthemis aciphylla* var. *Discoidea* Boiss.

Table 5.2 Detected Flora Species

FAMILY	TAXON	TURKISH NAME	P.G.R	HABITAT								RELATIVE ABUNDANCE					END. STATUS			THREATENED CATEGORY	DETERMINATION TYPE L/O/T
				1	2	3	4	5	6	7	8	1	2	3	4	5	L	B	Y		
PTERIDOPHYTA																					
Aspleniaceae	*Asplénium onopteris* L.	Kalkan eğreltisi		X								X									O
Hypolepidaceae	*Pteridium aquilinum* (L.) Kuhn	Eğrelti		X									X								O
SPERMATOPHYTA																					
ANGIOSPERMAE																					
DICOTYLEDONES																					
Amaranthaceae	*Amaranthus retrofiexus* L.	Tilki kuyruğu					X					X									T
Apiaceae	*Tordylium apulum* L.	Kafka lid a	Mediterranean				X					X									T
	Torilis arvensis (Huds.) Link subsp. *arvensis*	Dercik otu					X					X									T
	Torilis japónica (Houtt.) DC.	Uzun d ercik otu					X						X								T
Araliaceae	*Hederá helix* L.	Duvar sarmaşığı		X									X								O
Asteraceae	*Anthemis aciphylla* var. *discoidea* Boiss.	İğne papatyası	Mediterranean							X		X							X	LC	T
	Bellis perennis L.	Koyun gözü	Euro-Siberian	X						X			X								O
	Carduus nutans L.	Eşek dikeni								X		X									O
	Carthamus lanatus L.	Sarı diken								X		X									O
	Centaurea ibérica Trev. ex Sprengel	Deligöz dikeni		X						X		X									T
	Cichorium pumilum Jacq.	Dünek	Mediterranean	X						X		X									T
	Cirsium creticum (Lam.) d'Urv. subsp. *creticum*	Eşek çalısı	Mediterranean	X									X								T
	Cirsium hypoleucum DC.	Vişne kangalı	Euxin	X									X								O
	Conyza canadensis (L.) Cronquist	Selvi otu					X					X									O
	Crepis foetida L. subsp. *commutata* (spreng.)	Kohum					X			X			X								T
	Crepis neglecta L.		-	X								X									T
	Hyoseris radiata L.	Semirten	Mediterranean	X						X		X									T
	Lapsana communis L. subsp. *intermedia* (Bieb.)	Şebrek		X									X								O

FAMILY	TAXON	TURKISH NAME	P.G.R	HABITAT								RELATIVE ABUNDANCE					END. STATUS			THREATENED CATEGORY	DETERMINATION TYPE L/O/T
				1	2	3	4	5	6	7	8	1	2	3	4	5	L	B	Y		
	Matricaria chamomilla var. *recutita* L.	Alman papatyası								X			X								O
	Senecio vernalis Waldst. & Kit.	Kanarya otu								X			X								O
	Sonchus asper (L.) Hill subsp. *glaucescens* (Jordan) Ball	Gevirtlek					X			X			X								T
	Taraxacum scaturiginosum G. Hagl	Kıvırkıvır					X			X			X								T
Boraginaceae	*Echium italicum* L.	Kurt kuyruğu	Mediterranean	X								X									T
Brassicaceae	*Brassica nigra* (L.) Koch	Karahardal								X			X								O
	Capsella bursa-pastoris (L.) Medik.	Çoban çantası					X						X								O
	Descurainia sophia (L.) Webb ex Prantl	Sadır otu					X			X			X								T
	Raphanus raphanistrum L.	Eşek turpu					X			X			X								T
	Rapistrum rugosum (L.) All.	Kedi turpu					X			X			X								O
	Thlaspi perfoliatum L.						X			X				X							T
Campanulaceae	*Campanula rapunculus* L. var. *lambertiana* (Boiss.)	Sidikli çan çiçeği		X									X								T
Caryophyllaceae	*Minuartia mediterránea* (Ledeb.) K. Maly	Yalı tıstısı	Mediterranean	X										X							T
	Silene dichotoma Ehrh. subsp. *dichotoma*	Çatal nakil	Euro-Siberian	X									X								T
Cistaceae	*Cistus creticus* L.	Laden	Mediterranean	X										X							O
Convolvulaceae	*Calystegia sepium* L. subsp. *sepium* (L.) R. Br.	Çit sarmaşığı		X									X								O
	Convolvulus arvensis L.	Tarla sarmaşığı					X			X				X							O
Corylaceae	*Corylus avellana* L. var. *avellana* L.	Fındık	Euro-Siberian				X							X							O
	Carpinus betulus L.	Gürgen	Euro-Siberian	X										X							O
Crassulacea	*Sedum sediforme* (Jacq.) PAU	Yalı koruğu	Mediterranean							X			X								T
Ericaceae	*Erica arbórea* L.	Funda	-	X										X							T
	Rhododendron luteum Sweet	Zifin		X								X									O

FAMILY	TAXON	TURKISH NAME	P.G.R	HABITAT								RELATIVE ABUNDANCE					END. STATUS			THREATENED CATEGORY	DETERMINATION TYPE L/O/T
				1	2	3	4	5	6	7	8	1	2	3	4	5	L	B	Y		
Euphorbiaceae	*Euphorbia platyphyllos* L.	Koca sütleğen		X						X			X								T
	Euphorbia stricta L.	Katı sütleğen	Euro-Siberian	X						X			X								T
Fabaceae	*Dorycnium rectum* (L.) Ser.	Deli kaplan otu	Mediterranean	X									X								T
	Galega officinalis L.	Keçi sedefi	Euro-Siberian	X						X			X								T
	Genista lydia Boiss. var. *lydia* Griseb.		Mediterranean	X								X									T
	Lathyrus sphaericus Retz.	Çam burçağı		X									X								T
	Lotus corniculatus var. *corniculatus* L.	Gazal boynuzu		X			X						X								T
	Trifolium arvense L. var. *arvense*	Tavşan ayağı					X			X			X								T
	Trifolium campestre Schreb. subsp.	Üçgül		X						X			X								T
	campestre var. *campestre*																				
	Trifolium resupinatum L.	Anadolu üçgülü								X			X								T
	Vicia sativa L. subsp. *sativa* L.	Fiğ		X								X									T
Fagaceae	*Castanea sativa* Miller	Kestane	Euro-Siberian	X										X							T
	Fagus orientalis Lipsky	Kayın	Euro-Siberian	X												X					T
	Quercus frainetto Ten.	Macar meşesi	Euro-Siberian	X												X					T
	Quercus pubescens Willd	Tüylü meşe		X										X							T
Geraniaceae	*Erodium cicutarium* (L.) L'Herit. subsp.	İğnelik					X						X								T
	cicutarium (L.) L'Herit.																				
	Geranium columbinum L.	Güvercin ıtırı		X										X							O
	Geranium sylvaticum L.	Orman ıtırı	Euro-Siberian	X										X							T
Hypericaceae	*Hypericum aviculariifolium* Jaub et Spach subsp. b*yzantium* (Azn.) robson	Mide otu	Mediterranean	X								X							X	LC	T

FAMILY	TAXON	TURKISH NAME	P.G.R	HABITAT								RELATIVE ABUNDANCE					END. STATUS			THREATENED CATEGORY	DETERMINATION TYPE L/O/T
				1	2	3	4	5	6	7	8	1	2	3	4	5	L	B	Y		
	Hypericum calycinum L.	Koyun kıran	Euro-Siberian	X									X								T
	Hypericum perforatum L.	Kantaron	Mediterranean	X						X			X								T
Lamiaceae	*Prunella vulgaris* L.	Gelincikle me otu	Euro-Siberian	X						X		X									O
	Salvia glutinosa L.	Oklu şalba		X								X									T
	Teucrium polium L.	Acı yavşan	Mediterranean				X			X			X								T
Myrsinaceae	*Anagallis arvensis* L. var. *arvensis*	Fare kulağı								X		X									O
Oleaceae	*Phillyrea latifolia* L.	Akça kesme	Mediterranean	X								X									O
Papaveraceae	*Papaver dubium* L.	Köpek yağı								X		X									T
Plantaginaceae	*Plantago lanceolata* L.	Damarlıca					X			X			X								T
	Plantago major L. subsp. *major L.*	Sinir otu					X						X								T
Polygonaceae	*Rumex acetosella* L.	Kuzu kulağı		X			X					X									T
Ranunculaceae	*Clematis viticella* L.	Yakmuk	-	X								X									T
	Helleborus oriental is Lam.	Çöpleme	Euro-Siberian	X								X									O
	Ranunculus constantinopolitan u s (DC.) D'Urv	Kağıthane çiçeği					X						X								O
	Ranunculus ficaria L. subsp. *Ucariiformis* Rouy et Fouc.	Arpacık salebi		X									X								T
Rosaceae	*Geum urbanum* L.	Meryem otu	Euro-Siberian	X								X									O
	Mespilus germanica L.	Muşmuşla	Euro-Siberian	X								X									O
	Potentilla reptans L.	Reşatın otu								X			X								T
	Rubus discolor Weihe et Nees			X										X							T
Rubiaceae	*Asperula arvensis* L.	Tarla belum otu	Mediterranean	X									X								T
Salicaceae	*Salix caprea* L.	Sorgun	Euro-Siberian	X								X									O
Scrophulariaceae	*Digitalis ferruginea* L.	Arı kovanı	Euro-Siberian	X								X									O
	Veronica hederifolia L.	Bahar								X		X									T

FAMILY	TAXON	TURKISH NAME	P.G.R	HABITAT								RELATIVE ABUNDANCE					END. STATUS			THREATENED CATEGORY	DETERMINATION TYPE L/O/T
				1	2	3	4	5	6	7	8	1	2	3	4	5	L	B	Y		
		mavisi																			
Tiliaceae	*Tilia argéntea* Desf. Ex DC.	Ihlamur	Euro-Siberian	X									X								O
Violaceae	*Viola canina* L.	İt menekşesi		X									X								T
MONOCOTYLEDONAE																					
Asparagaceae	*Asparagus acutifolius* L.	Tilkişen	Mediterranean	X								X									O
Cyperaceae	*Carex flacca* Schrebersubsp. *serrulata* (Biv.) Greuter	Boz çayır sazı	Mediterranean	X									X								T
Liliaceae	*Gagea villosa* (Bieb.) Duby var. *villosa* (Bieb.) Duby	Tüylü yıldız	Mediterranean	X						X		X									O
	Muscari neglectum Guss. ex. Ten.	Arap üzümü								X		X									O
	Ruscus acuelatus L.	Tavşan memesi		X								X									O
Poaceae	*Aegilops geniculata* Roth.	Konbaş	Mediterranean							X			X								T
	Briza maxima L.	Tavşan küpesi								X			X								T
	Bromus diandrus Roth.	Kılçık otu					X			X			X								T
	Phalaris paradoxa L.	Topuzlu kaynaş	Mediterranean	X						X			X								T
	Poa annua L.	Salkım otu		X						X				X							O
	Poa trivialis L.	Kaba salkım otu		X						X				X							T
Smilacaceae	*Smilax excelsa* L.	Diken ucu	Euro-Siberian	X								X									T

5.2.3 Fauna

The main objective of terrestrial fauna studies is to identify key areas for fauna species that would potentially be impacted by the Project-related activities, as well as to identify terrestrial fauna elements inhabiting the Project Area. Avifauna studies have been conducted separately, and are presented in Section 5.2.4 of this Report. Therefore, this section is to provide an assessment on the other groups of terrestrial vertebrates including; amphibians, reptiles, and mammals other than bats.

Project area is located within the borders of Kandira District of Kocaeli Province, at heights of 70-300 meters. The application area of the project consists of 75% mixed forest vegetation, the remaining part is meadows and forest glade. Hazelnut gardens created by clearing the forest are included as agricultural areas. Forest vegetation has a deciduous forest structure with a mixture of beech, hornbeam and chestnut, and structure covered with ground cover species at the base. The project area, which is located at a distance of 2 km in the north of the Black Sea and open to the winds from the sea, consists of habitats with high bioma with rainy and damp structure.

6 amphibian, 17 reptile and 37 mammal species determined in the study area. The vertebrate species identified in the habitats where the project will be made, are generally the species with high ecological tolerance that are common in nature and able to migrate to neighboring habitats when needed.

Amphibians (Amphibia)

6 amphibians species identified in the study area live in small water bodied, forest and scrub areas formed by deciduous vegetation, in humid environments, under rock crevices and stones. Especially terrestrial species calmly hide during the day and are active at night for feeding and mating.

According to the assessment made regarding the conservation status of the Amphibian species identified in the project site and according to the updated list prepared and updated by the IUCN European Red List (ERL), all 6 Amphibian species in the area are included in the "LC" (least concerning) category. According to the BERN convention, 3 of the 6 amphibian species are identified in Annex-IN "List of Strictly Protected Species", and 3 amphibian species are identified in Annex-N "List of Protected Species". One of them is Salamander and 5 of them are Frog.

There are no endemic species for the area among the amphibian species whose existence is determined within the study area.

Reptiles (Reptilia)

The reptile species existing in the area were determined in order to evaluate the ecosystem of the activities planned within the scope of the Project. Reptiles can survive in rocky meadows, field edges and scrub where they can meet their ecological needs in the project area. As a result of the observations and interviews made in the field, it was determined that 17 reptile species live in the project area and ecological impact areas. The 3 of them are turtles, 2 of them are agama, 7 of them are lizards, and the other 6 are snakes.

According to the assessment based on the European Red List (ERL) prepared by IUCN, within the 15 Reptile species listed in the project area and ecological impact areas; 1 of them is determined in VU, 1 of them is determined in LR, 9 of them are determined in LC (Least Concern/Treathened), 1 of them is determined in NE (No Evaluation) category.

According to annex lists of Bern Convention, within the project area and ecological impact areas, 11 of the reptile species determined as Annex-II, the rest determined as Annex-III.

According to the CITES agreement, 1 species of reptile (*Testudo graeca* = Common Tortoise) is included in ANNEX II.

There are no endemic species among the reptile species that have been identified in the project area and ecological impact areas.

Mammals (Mammalia)

The field observations and interviews with the local people have been evaluated together with the existing literature in order to identify Mammals (Insectivours, Bats, Rabbits, Rodents, Predators and Ungulates), which exist within the the Project area. While creating the table of mammal species in the area, the natural ecosystem features in which the area is included and the existing fauna were listed as well.

As a result of the field studies, literature researches and interviews conducted within the study area, it was determined that 38 mammal species live in the study area. The species include; 4 insectivorous, 1 hedgehog, 1 rabbit, 11 bats, 11 rodents, 7 carnivorous and 2 artiodactyla.

According to the IUCN European Red List (ERL), within the mammal species determined to exist within the study area and ecological impact boundaries; 32 of the Mammal species are in the LC (Least Concern) "Least Threatened", 1 of which is in DD (Data Deficient) "Species with insufficient information", 2 of them are in VU (Species with high risk of extinction in wildlife), 2 of them are in NT (Near Threatened) "Not currently in danger but candidate of VU, EN or CR category in the near future" categories.

According to annex lists of Bern Convention, within the project area and ecological impact areas, 12 of the mammal species determined as Annex-II, 14 of them determined as Annex-IN and the rest are not included in Bern Convention Annex Lists.

Table 5.3 Amphibia (Amphibia) Species Live in the Project Application Area and the Near Environment and Their Protection Status

No.	ORDER	FAMILY	SPECIE	TURKISH NAME	IUCN	BERN	CITES	EU Habitats Directive	Abundance State	Identification Type
1	CAUDATA (Salamanders)	Salamandridae (Salamandridae)	*Triturus vulgaris (=Lissotriton vulgaris)*	Küçük Semender	LC	Annex-III			Rare	L,O
2	ANURA (Tailles Frogs)	Pelobatidae (Pelobatidae)	*Pelobates syriacus*	Toprak Kurbağası	LC	Annex -II		EK-IV	Low	L,O
3	ANURA (Tailles Frogs)	Bufonidae (Toads)	*Pseudepidalea viridis (=Bufo viridis)*	Gece Kurbağası	LC	Annex II		EK-IV	Low	L,O
4	ANURA (Tailles Frogs)	Bufonidae (Toads)	*Bufo bufo*	Siğilli Kurbağa	LC	Annex -III			Low	L,O
5	ANURA (Tailles Frogs)	Hylidae (Hylidae)	*Hyla arbórea*	Ağaç Kurbağası	LC	Annex -II		EK-IV	Low	L,O
6	ANURA (Tailles Frogs)	Ranidae (Bullfrog)	*Pelodytes bendriagae*	Levanten Kurbağası	LC	Annex -III			Abundant	L,O

Table 5.4 Reptile (Reptilia) Species Live in the Project Application Area and the Near Environment and Their Protection Status

No.	ORDER	FAMILY	SPECIE	TURKISH NAME	IUCN	BERN	CITES	EU Habitats Directive	Abundance State	Identification Type
1	TESTUDINES (TURTLES)	TESTUDINIDAE (TORTOISE)	*Testudo graeca* (Linnaeus, 1758)	Yaygın Tosbağa	VU - A1cd	ANNEX-II	ANNEX -II	ANNEX -II	Low	L,O
2	TESTUDINES (TURTLES)	EMYDIDAE	*Emys orbicularis* (Linnaeus, 1758)	Benekli Kaplumbağa	LR	ANNEX -II		ANNEX -II	Rare	L,O
3	TESTUDINES (TURTLES)	EMYDIDAE	*Mauremys rivulata* (Valenciennes, 1833)	Balkan Çizgili Kaplumbağası	LC				Low	L,O
4	SQUAMATA (SCALY REPTİLES)	GEKKONIDAE (GEKOS, GEKKONIDAE)	*Cyrtopodion (=Mediodactylus) kotschyi* Steindachner, 1870	İnce Parmaklı Keler	LC	ANNEX -II		ANNEX -IV	Rare	L,O
5	SQUAMATA (SCALY REPTİLES)	GEKKONIDAE (GEKOS, GEKKONIDAE)	*Hemidactylus turcicus* (Linnaeus, 1758)	Geniş Parmaklı Keler	LC	ANNEX -III			Rare	L,O
6	SQUAMATA (SCALY REPTİLES)	ANGUINIDAE (SLOWWORM)	*Pseudopus apodus* (Pallas, 1775)	Oluklu Kertenkele	NE	ANNEX -II			Low	L,O
7	SQUAMATA (SCALY REPTİLES)	SCINCIDAE (SCINCIDAE)	*Ablepharus kitaibeili* Bibron et Bory, 1833	İnce Kertenkele	LC	ANNEX -II		ANNEX -IV	Low	L,O
8	SQUAMATA (SCALY REPTİLES)	LACERTIDAE (LACERTIDAE)	*Ophisops elegans* Menetries, 1832	Tarla Kertenkelesi	NE	ANNEX -II		ANNEX -IV	Abundant	L,O
9	SQUAMATA (SCALY REPTİLES)	LACERTIDAE (LACERTIDAE)	*Lacerta viridis* (Laurenti, 1768)	Yeşil Kertenkele	LC	ANNEX -II		ANNEX -IV	Abundant	L,O
10	SQUAMATA (SCALY REPTİLES)	LACERTIDAE (LACERTIDAE)	*Lacerta trilineata* Bedriaga, 1886	Büyük Yeşil Kertenkele	LC	ANNEX -II		ANNEX -IV	Abundant	L,O
11	SQUAMATA (SCALY	LACERTIDAE	*Lacerta*	Duvar	LC	ANNE			Low	L,O

No.	ORDER	FAMILY	SPECIE	TURKISH NAME	IUCN	BERN	CITES	EU Habitats Directive	Abundance State	Identification Type
	REPTİLES)	(LACERTIDAE)	*(=Podarcis) muralis (Laurenti, 1768)*	Kertenkelesi		X -II				
12	SOUAMATA (SCALY REPTİLES)	BOIDAE (BOA)	*Eryx jaculus* Linnaeus, 1758	Mahmuzlu Yılan	NE	ANNEX -lll		ANNEX -IV	Low	L,O
13	SOUAMATA (SCALY REPTİLES)	COLUBRIDAE (SNAKES)	*Coluber (=Dolichophis) caspius* Gmelin, 1789	Hazer Yılanı	NE	ANNEX -II		ANNEX -IV	Low	L,O
14	SOUAMATA (SCALY REPTİLES)	COLUBRIDAE (SNAKES)	*Eirenis modestus* (Martin, 1838)	Uysal Yılan	LC	ANNEX -lll		ANNEX -IV	Low	L,O
15	SOUAMATA (SCALY REPTİLES)	COLUBRIDAE (SNAKES)	*Elaphe sauromates*	Sarı Yılan	NE	ANNEX -lll			Low	L,O
16	SOUAMATA (SCALY REPTİLES)	COLUBRIDAE (SNAKES)	*Natrix natrix* (Linnaeus, 1758)	Yarı Sucul Yılan, Küpeli Su Yılanı	LC	ANNEX -lll		ANNEX -IV	Low	L,O
17	SOUAMATA (SCALY REPTİLES)	COLUBRIDAE (SNAKES)	*Natrix tessellata* (Laurenti, 1768)	Su Yılanı	NE	ANNEX -II		ANNEX -IV	Abundant	L,O

Table 5.5 Mammals (Mammalia) Species Live in the Project Application Area and the Near Environment and Their Protection Status

No.	ORDER	FAMILY	SPECIE	TURKISH NAME	IUCN	BERN	CITES	EU Habitats Directive	Abundance State	Identification Type
1	SORICOMORPHA	Soricidae	*Sorex satunini*	Kafkas Sivriburunlufaresi	LC	Annex-III			Low	L,O
2	SORICOMORPHA	Soricidae	*Crocidura leucodon*	Sivriburunlu Tarlafaresi	LC	Annex-III			Low	L,O
3	SORICOMORPHA	Soricidae	*Crocidura suaveolens*	Sivriburunlu Bahçefaresi	LC	Annex-III			Low	L,O
4	SORICOMORPHA	Talpidae	*Talpa levantis*	Karadeniz Köstebeği	LC	-			Abundant	L,O
5	ERINACEOMORPHA	Erinaceidae	*Erinaceus concolor*	Kirpi	LC	-			Abundant	L,O
6	LAGOMORPHA	Leporidae	*Lepus europaeus*	Yabani Tavşan	LC	Annex-III			Low	L,O
7	CHIROPTERA	Rhinolophidae	*Rhinolophus ferrumequinum*	Büyük Nalburunlu Yarasa	LC	ANNEX-II		ANNEX-II	Low	L,O
8	CHIROPTERA	Rhinolophidae	*Rhinolophus euryale*	Akdeniz Nalburunlu Yarasası	NT	ANNEX-II		ANNEX-II	Low	L,O
9	CHIROPTERA	Rhinolophidae	*Rhinolophus hipposideros*	Küçük Nalburunlu Yarasa	LC	ANNEX-II		ANNEX-II	Low	L,O
10	CHIROPTERA	Rhinolophidae	*Rhinolophus mehelyi*	Mehely'in Nalburunlu Yarasası	VU - A4c	ANNEX-II		ANNEX-II	Low	L,O
11	CHIROPTERA	Vespertilionidae	*Myotis blythii*	Küçük Farekulaklı Yarasa	LC	ANNEX-II		ANNEX-II	Low	L,O
12	CHIROPTERA	Vespertilionidae	*Myotis capaccinii*	Uzunayaklı Yarasa	VU - A4bce	ANNEX-II		ANNEX-II	Low	L,O
13	CHIROPTERA	Vespertilionidae	*Myotis emarpinatus*	Kirpikli Yarasa	LC	ANNEX-II		ANNEX-II	Low	L.G
14	CHIROPTERA	Vespertilionidae	*Myotis myotis*	Büyük fare Kulaklı Yarasa	LC	ANNEX-II		ANNEX-II	Low	L.G

No.	ORDER	FAMILY	SPECIE	TURKISH NAME	IUCN	BERN	CITES	EU Habitats Directive	Abundance State	Identification Type
15	CHIROPTERA	Vespertilionidae	*Pipistrellus pipistrellus*	Cüce Yarasa	LC	Annex-III			Abundant	L,O
16	CHIROPTERA	Vespertilionidae	*Eptesicus serotinus*	Geniş Kanatlı Yarasa	LC	ANNEX-II			Low	L,O
17	CHIROPTERA	Miniopteridae	*Miniopterus schreibersii*	Uzunkanatlı Yarasa	NT	ANNEX-II			Low	L,O
18	RODENTIA	Sciuridae	*Sciurus anomalus*	Sincap	LC	ANNEX-II		ANNEX-IV	Low	L,O
19	RODENTIA	Cricetidae	*Microtus subterraneus*	Kısakulaklı Fare	LC				Abundant	L,O
20	RODENTIA	Muridae	*Apodemus flavicollis*	Sarı boyunlu Ormanfaresi	LC	-			Abundant	L,O
21	RODENTIA	Muridae	*Rattus rattus*	Sıçan	LC	-			Abundant	L,O
22	RODENTIA	Muridae	*Rattus norvepicus*	Göçmen Sıçan	LC	"			Abundant	L,O
23	RODENTIA	Muridae	*Mus domesticus*	Evfaresi	LC	-			Abundant	L,O
24	RODENTIA	Muridae	*Mus macedonicus*	Sarı Evfaresi	LC				Abundant	L,O
25	RODENTIA	Spalacidae	*Nannospalax nehrinpi*	Anadolu Körfaresi	DD	"			Abundant	L,O
26	RODENTIA	Gliridae	*Glis plis*	Yediuyur	LC	Annex-III			Low	L,O
27	RODENTIA	Gliridae	*Dryomys nitedula*	Hasancık, Ağaç Yediuyuru	LC	Annex-III		ANNEX-IV	Low	L,O
28	RODENTIA	Gliridae	*Muscardinus avellnarius*	Fındık Faresi	LC	Annex-III		ANNEX-IV	Rare	L,O
29	CARNIVORA	Canidae	*Canis aureus*	Çakal	LC	-			Low	L,O
30	CARNIVORA	Canidae	*Vulpes vulpes*	Tilki	LC	-			Abundant	L,O
31	CARNIVORA	Mustelidae	*Mustela nivalis*	Gelincik	LC	Annex-III			Low	L.G
32	CARNIVORA	Mustelidae	*Martes foina*	Kaya Sansarı	LC	Annex-III			Abundant	L,O
33	CARNIVORA	Mustelidae	*Meles meles*	Porsuk	LC	Annex-III			Low	L,O
34	CARNIVORA	Felidae	*Lynx lynx*	Vaşak	LC	Annex-III	Annex-II	ANNEX-II, ANNEX-IV	Low	L,O
35	CARNIVORA	Felidae	*Felis silvestris*	Yaban Kedisi	LC	ANNEX-II	Annex-II	ANNEX-IV	Low	L,O
36	ARTIODACTYLA	Suidae	*Sus scrota*	Yabandomuzu	LC	-			Abundant	L,O
37	ARTIODACTYLA	Cervidae	*Capreolus capreolus*	Karaca	LC	Annex-III			Low	L,O

5.2.4 Birds

Both field studies and desk studies were carried out to determine the bird species in the project area and its immediate surroundings.

According to the data obtained from ornithological field observations made in June 2020, field studies and literature research, the systematic categories (Order and Family), scientific, Turkish names of the bird species identified in the project areas are shown in Table 5.6. Accordingly, 81 bird species belonging to 12 bird orders and 31 bird families were determined at the project sites. Within these bird species seen in Table 5.6, 43 are in the "nonpasseres" group and 55 species are in the "songbirds" (Passeres) group. All of the 81 bird species identified were determined as a result of field studies, literature research and habitat suitability, and some of them were confirmed in the survey interviews with the local people.

Turkey has a total of 468 bird species belonging ornitom-fauna. Considering that, detected number of species (81 species) within the project area compose approximately one quarter of the bird fauna of Turkey, therefore, the area was assessed as moderate intensity ornitofauna. The project sites have been evaluated as ornithologically important due to the fact that the project sites are represented by medium density species number and low population density in terms of bird species, have different vegetation layers and have suitable habitats for birds. The bird species that can be found in the project sites consist of species with various ecological requirements due to the presence of various habitats. Nevertheless, there are no rare species among the species encountered and the species are generally common and widely distributed bird species.

Habitats where identified bird species are observed, biological activities of the birds and the existence of suitable alternative areas outside the project sites (in the immediate vicinity)

Project sites, especially the peaks where wind turbines will be installed, are hilly areas with higher altitude compared to the ground of the Black Sea coast, considering the topography of the region. The vegetation in these areas, especially at the points where the turbine poles will be installed, generally consists of deciduous forest areas, pasture areas and unused agricultural areas. The vegetation of these sites does not contain habitats suitable for waterfowl species. The bird species that can be found at most of the turbine points are mostly ground songbirds. For this reason, it has been determined that the bird fauna will be represented relatively weakly and with fewer species-individuals, especially in hilly areas. Therefore, it has been determined that the project sites do not contain housing habitats in terms of wildlife, especially birds.

This situation could be considered as the reason for the low number of bird species (81 bird species) and population density at the points where the turbine poles will be erected. In the project areas, there are no still and / or fluid wetlands (such as streams, lakes, mud flats) that birds can benefit from. As a result of the studies carried out, it has been determined that the project sites and the areas outside these areas with similar vegetation do not have the ecological carrying capacity that will enable a region preferred by birds as a core breeding area and accommodation during migration.

Seasonal status of the bird species identified in the project sites were evaluated and 26 of the 81 bird species were determined to be migratory species. 4 species use the area for wintering. All other species have been determined to be "native bird species" that are found in these areas throughout the year. Considering that the bird species are widespread and most of the birds found in the project sites are native species, no negative impact is expected. The densities of migratory birds, their area use duration, their species, their flight altitudes etc. should be determined and reported by the observations made by expert ornithologists during each migration period.

Table 5.6 Scientific nomenclature and national and international protection measures for bird species recorded in Kandira WPP project sites

ORDER	Family	Scientific Name	Turkish Name	English Name	IUCN	BERN	CITES	EU Bird Directive	Status
Pelecaniformes	Ardeidae	*Ardea cinérea*	Gri Balıkçıl	Grey Heron	LC	Annex-III			Y
Ciconiiformes	Ciconiidae	*Ciconia nigra*	Kara Leylek	Black Stork	LC	ANNEX-II	ANNEX-II	ANNEX-I	GY
Ciconiiformes	Ciconiidae	*Ciconia ciconia*	Leylek	White Stork	LC	ANNEX-II		ANNEX-I	GY
Accipitnformes	Accipitridae	*Pernis apivorus*	Arı Şahini	Honey Buzzard	LC	ANNEX-II	-	ANNEX-I	Y
Accipitriformes	Accipitridae	*Circaetus gallicus*	Yılan Kartalı	Short-Toed Eagle	LC	ANNEX-II	-	ANNEX-I	Y
Accıpitriformes	Accipitridae	*Circus aeruginosus*	Saz Delicesi	Marsh Harrier	LC	ANNEX-II	-	ANNEX-I	Y
Accipitriformes	Accipitridae	*Accipiter nisus*	Atmaca	Sparrowhawk	LC	ANNEX-II	-	ANNEX-I	Y
Accipitriformes	Accipitridae	*Bufeo bufeo*	Şahın	Buzzard	LC	ANNEX-II	-		Y
Accipitriformes	Accipitridae	*Bufeo rufmus*	Kızıl Şahin	Long-Legged Buzzard	LC	ANNEX-II	-	ANNEX-I	Y
Accipitriformes	Accipitridae	*Clanga pomarina*	Küçük Orman Kartaıı	Lesser Spotted Eagle	LC	ANNEX-II	-	ANNEX-I	GY
Falconiformes	Falconidae	*Falco tinnunculus*	Kerkenez	Kestrel	LC	ANNEX-II	-		Y
Columbiformes	Coiumbidae	*Columba livia*	Kaya Güvercini	Rock Dove	LC	Annex-III		ANNEX-II	Y
Columbiformes	Coiumbidae	*Columba palumbus*	Tahtalı	Woodpigeon	LC	-		ANNEX-II	Y
Columbiformes	Coiumbidae	*Streptopelia decaocto*	Kumru	Collared Dove	LC	Annex-III		ANNEX-II	Y
Columbiformes	Coiumbidae	*Streptopelia turtur*	Üveyik	Turtle Dove	**VU**	Annex-III		ANNEX-II	G
Cuculiforınes	CucuİKjae	*Cuculus canorus*	Guguk	Cuckoo	**LC**	Annex-III			G
Strigiformes	Strigidae	*Athene noctua*	Kukumav	Little Owl	**LC**	ANNEX-II	-		Y
Strigiformes	Strigidae	*Strix aluco*	Alaca Baykuş	Tawny Owl	**LC**	ANNEX-II	-		Y
Caprimulg iformes	Caprimulgidae	*Caprimulgus europaeus*	Çobanaldatan	Nightjar	**LC**	ANNEX-II		ANNEX-I	G

ORDER	Family	Scientific Name	Turkish Name	English Name	IUCN	BERN	CITES	EU Bird Directive	Status
Caprimulg iformes	Apodidae	*Apus apus*	Ebabil	Swift	**LC**	Annex-III			G
Coraciiformes	Meropidae	*Merops apiaster*	Arı kuşu	Bee-Eater	**LC**	ANNEX-II			G
Bucerotiformes	Upupidae	*Upupaepops*	İbibik	Eurasian Hoopoe	**LC**	ANNEX-II			G
Piciformes	Picidae	*Picus viridis*	Yeşil Ağaçkakan	Green Woodpecker	**LC**	ANNEX-II			Y
Piciformes	Picidae	*Dendrocopos major*	Orman Alaca Ağaçkakanı	Great-Spotted Woodpecker	**LC**	ANNEX-II		ANNEX-I	Y
Piciformes	Picidae	*Dendrocopos syriacus*	Alaca Ağaçkakan	Syrian Woodpecker	**LC**	ANNEX-II		ANNEX-I	Y
Piciformes	Picidae	*Dendrocopos medius*	Ortanca Ağaçkakan	Middle Spotted Woodpecker	**LC**	ANNEX-II		ANNEX-I	Y
Piciformes	Picidae	*Dendrocopos minor*	Küçük Ağaçkakan	Lesser Spotted Woodpecker	**LC**	ANNEX-II			Y
Passeriformes	Alaudidae	*Gaterida cristata*	Tepeli Toygar	Crested Lark	**LC**	Annex-III			Y
Passeriformes	Alaudidae	*Lullula arbórea*	Orman Toygarı	Woodlark	**LC**	Annex-III		ANNEX-I	Y
Passeriformes	Hirundinidae	*Hirundo rustica*	Kır Kırlangıcı	Swallow	**LC**	ANNEX-II			G
Passeriformes	Hirundinidae	*Hirundo daurica*	Kızıl Kırlangıç	Red-Rumped Swallow	**LC**	ANNEX-II			G
Passeriformes	Hirundinidae	*Delichon urbicum*	Ev Kırlangıcı	House Martin	**LC**	ANNEX-II			G
Passeriformes	Motacillidae	*Anthus trivialis*	Ağaç İncirkuşu	Tree Pipit	**LC**	ANNEX-II			G
Passeriformes	Molacillidae	*Motacilla cinerea*	Dağ Kuyruksallayanı	Grey Wagtail	**LC**	ANNEX-II			y
Passeriformes	Motacillidae	*Motacilla alba*	Ak Kuyruksallayan	Pied Wagtail	**LC**	ANNEX-II			Y
Passeriformes	Troglodytidae	*Troglodytes troglodytes*	Çıtkuşu	Wren, Winter Wren	**LC**	ANNEX-II		ANNEX-I	Y
Passeriformes	Muscicapidae	*Erithacus rubecula*	Kızılgerdan	Robin	**LC**	ANNEX-II			Y
Passeriformes	Muscicapidae	*Luscinia megarhynchos*	Bülbül	Nightingale	**LC**	ANNEX-II			G
Passeriformes	Muscicapidae	*Phoenicurus ochruros*	Kara Kızılkuyruk	Black Redstart	**LC**	ANNEX			Y

ORDER	Family	Scientific Name	Turkish Name	English Name	IUCN	BERN	CITES	EU Bird Directive	Status
						-II			
Passeriformes	Muscicapidae	*Phoenicurus phoenicurus*	Kızılkuyruk	Redstart	**LC**	ANNEX -II			Y
Passeriformes	Muscicapidae	*Saxícola torquata*	Taşkuşu	Stonechat	**LC**	ANNEX -II			Y
Passeriformes	Muscicapidae	*Oenanthe oenanthe*	Kuyrukkakan	Northern Wheatear	**LC**	ANNEX -II			G
Passeriformes	Muscicapidae	*Oenanthe hispánica*	Kara Kulaklı Kuyrukkakan	Black-Eared Wheatear	**LC**	ANNEX -II			G
Passeriformes	Muscicapidae	*Muscícapa striata*	Benekli Sinekkapan	Spotted flycatcher	**LC**	ANNEX -II			G
Passeriformes	Turd id ae	*Turd us merula*	Karatavuk	Blackbird	**LC**	Annex-III			Y
Passeriformes	Turd id ae	*Turdus philomelos*	Öter Ardıç	Song Thrush	**LC**	Annex-III		ANNEX-II	Y
Passeriformes	Turd id ae	*Turd us viscivorus*	Ökse Ardıcı	Mistle Thursh	**LC**	Annex-III		ANNEX-II	Y
Passeriformes	Sylviidae	*Hippolais paKida*	Ak Mukallit	Olivaceous Warbler	**LC**	Annex-III			G
Passeriformes	Sylviidae	*Sylvia melanocephala*	Maskeli Ötleğen	Sardinian Warbler	**LC**	ANNEX -II			y
Passeriformes	Sylviidae	*Sylvia curruca*	Küçük Ak Gerdanlı Ötleğen	Lesser Whitethroat	**LC**	ANNEX -II			G
Passeriformes	Sylviidae	*Sylvia communis*	Ak Gerdanlı Ötleğen	Whit eth roat	**LC**	ANNEX -II			G
Passeriformes	Sylviidae	*Phyiioscopus collybita*	Çıvgın	Chiffchaff	**LC**	ANNEX -II			Y
Passeriformes	Reguliidae	*Regulus regulus*	Çalıkuşu	Goldcrest	**LC**	ANNEX -II			Y
Passeriformes	Reguliidae	*Regulus ignicapillus*	Sürmeli Çalıkuşu	Firecrest	**LC**	ANNEX -II			Y
Passeriformes	Aegithalidae	*Aegithalos caudatus*	Uzun Kuyruklu Baştankara	Long-Tailed Tit	**LC**	Annex-III			Y
Passeriformes	Paridae	*Parus ater*	Çam baştankarası	Coal Tit	**LC**	ANNEX -II			Y
Passeriformes	Paridae	*Parus caeruleus*	Mavi Baştankara	Blue Tit	**LC**	ANNEX -II			Y
Passeriformes	Paridae	*Parus major*	Büyük Baştankara	Great Tit	**LC**	ANNEX -II			Y

ORDER	Family	Scientific Name	Turkish Name	English Name	IUCN	BERN	CITES	EU Bird Directive	Status
Passeriformes	Paridae	*Parus palustris*	Kayırı Baştankarası	Marsh Tit	**LC**	ANNEX -II			Y
Passeriformes	Sittidae	*Sitta europaea*	Sıvacı	Nuthatch	**LC**	ANNEX -II			Y
Passeriformes	Oriolidae	*Oriolus oriolus*	Sarıasma	Golden Oriole	**LC**	ANNEX -II			G
Passeriformes	Laniidae	*Lanius collurio*	Kızıl Sırtlı Örümcekkuşu	Red-Backed Shrike	**LC**	ANNEX -II			G
Passeriformes	Laniidae	*Lanius Senator*	Kızıl Başlı Örümcekkuşu	Woodchat Shrike	**LC**	ANNEX -II			YG
Passeriformes	Corvidae	*Garrulus glandarius*	Alakarga	Jay, Eurasian Jay	**LC**	—			Y
Passeriformes	Corvidae	*Pica pica*	Saksağan	Magpie,	**LC**	-			Y
Passeriformes	Corvidae	*Corvus monedula*	Küçük Karga	Jackdaw	**LC**	-			Y
Passeriformes	Corvidae	*Corvus cornix*	Leş Kargası	Hooded Crow	**LC**	-			Y
Passeriformes	Corvidae	*Corvus corax*	Kuzgun	Raven	**LC**	Annex-III			Y
Passeriformes	Sturriidae	*Sturnus vulgaris*	Sığırcık	Starling	**LC**	-			Y
Passeriformes	Passeridae	*Passer domesticus*	Serçe	House Sparrow	**LC**	-			Y
Passeriformes	Passeridae	*Passer hispaniolensis*	Söğüt Serçesi	Spanish Sparrow	**LC**	Annex-III			Y
Passeriformes	Passeridae	*Passer montanus*	Ağaç Serçesi	Tree Sparrow	**LC**	Annex-III			Y
Passeriformes	Fringillidae	*Fringiila coelebs*	İspinoz	Chaffinch	**LC**	Annex-III			Y
Passeriformes	Fringillidae	*Carpodacus erythrinus*	Çütre	Rosefinch	**LC**	ANNEX -II			YG
Passeriformes	Fringillidae	*Carduelis chloris*	Florya	Greenfinch	**LC**	ANNEX -II			Y
Passeriformes	Fringillidae	*Carduelis carduelis*	Saka	Goldfinch	**LC**	ANNEX -II			Y
Passeriformes	Fringillidae	*Carduelis cannabina*	Ketenkuşu	Linnet	**LC**	ANNEX -II			Y
Passeriformes	Emberizidae	*Emberiza cirlus*	Bahçe Kirazkuşu	Cirl Bunting	**LC**	ANNEX -II			Y
Passeriformes	Embarizidae	*Emberiza hortularia*	Kirazkuşu	Ortolan	**LC**	Annex-III			G
Passeriformes	Emberizidae	*Emberiza melanocephala*	Karabaşlı Kirazkuşu	Black-Headed Bunting	**LC**	ANNEX -II			G

ORDER	Family	Scientific Name	Turkish Name	English Name	IUCN	BERN	CITES	EU Bird Directive	Status
Passeriformes	Emberizidae	*Miliaria calandra*	Tarla Kirazkuşu	Corn Bunting	**LC**	Annex-III			Y

6. CRITICAL HABITAT ASSESSMENT

6.1 The Concept of Critical Habitat

Conservation of biodiversity requires protection of habitats for survival of species as well as sustenance of ecosystems. Habitats in a given area are classified based on their natural characteristics, as well as land use properties, to provide a better understanding of specific species and habitat requirements and establish meaningful management units to define a mitigation strategy. The ultimate goal is achieving no net loss of biodiversity.

For assessment of habitat features, the initial step is to distinguish between modified, natural and critical habitats, each of which requires different conservation efforts and compensatory measures to be protected. Definitions in this section are based on IFC PS6, and as for the critical assessment additional criteria were also used.

To start with, IFC PS6 requires that all habitats, whether they are modified, natural or critical, which indicates disturbed or degraded habitats, as well as manmade areas should also be considered in defining conservation strategies and mitigation measures.

Modified habitats, in the most general sense, are those that have been subject to some form of alteration, often resulting in agricultural land. Despite the fact that some modified habitats might lose all of their natural characteristics, it is still required to minimize further impacts.

Natural habitats are terrestrial habitats where the biological composition consists of native flora and fauna elements, and the degree of changes due to human activities in these habitats is very low.

Critical habitats are defined as the most sensitive biodiversity features, which include at least one of the following (IFC, 2012):

CH1: Habitats of concern to Endangered (EN) or Critical (CR) species

CH2: Habitats of importance for endemic or geographically restricted species

CH3: Habitats that host migratory or cluster species

CH4: Highly threatened and unique ecosystems

CH5: Areas associated with key evolutionary processes

6.2 Significance of Critical Habitat Assessment

In order for Kandira WPP project activities to be conducted in line with IFC PS6 in terms of conservation of critical habitats assessments in the BAP aim to lead achievement of the following results:

- To ensure no measurable adverse impacts on biodiversity values trigger critical habitats over the long-term at the regional scale
    - ✓ There would be some negative impacts due to Project activities (especially in the short term).
    - ✓ A biodiversity monitoring and evaluation program will be implemented to evaluate status of biodiversity values.
- To ensure no significant reduction in populations of critically endangered or endangered species

- ✓ While reduction in population does not imply survival of every single individual of a particular species, existence of species within the area in the long term must be assured.
- ✓ Impacts of the Project on these species will be monitored and evaluated as the Project proceeds.

6.3 Critical Habitat Methodology

In order to determine statuses o species identified during the baseline surveys, besides the IUCN Red List of Threatened Species utilised to determine endangered and critically endangered species, other criteria were also used in critical habitat assessment, wherever applicable. In determining "highly threatened and unique ecosystems", habitats listed under Annex I to Habitats Directive, as well as IUCN Red List assignments for ecosystems were used as the main criteria. Since international, even European biodiversity assessment do not always cover Turkish habitats and species, experts' judgments were often consulted to draw conclusions on the current statuses of biodiversity components. Referring to local expert judgment has also been utilised due to the fact that there are no officially established or widely accepted national evaluations on threat and conservation statuses of habitats and species.

6.3.1 Highly Threatened or Unique Ecosystems

According to IFC PS 6, highly threatened and/or unique ecosystems are those; (i) that are at risk of significantly decreasing in area or quality; (ii) with a small spatial extent; and/or (iii) containing unique assemblages of species including assemblages or concentrations of biome-restricted species. Areas determined to be irreplaceable or of high priority/significance based on systematic conservation planning techniques carried out at the landscape and/or regional scale by governmental bodies, recognized academic institutions and/or other relevant qualified organizations (including internationally recognized NGOs) or that are recognized as such in existing regional or national plans, such as the National Biodiversity Strategies and Action Plan, would qualify as critical habitat per Criterion 4 of IFC PS 6 critical habitat criteria.

As an attempt to assign IUCN Red List categories to ecosystems at local, regional and global levels, Rodriguez et al. (2011) developed a system "Establishing IUCN Red List Criteria for Threatened Ecosystems", based on the following main criteria:

- Criterion A: Short-term decline (in distribution or ecological function., over any 50-year period in the past or future)
- Criterion B: Historical decline (in distribution or ecological function; in the last 500 years)
- Criterion C: Small current distribution and decline (in distribution or ecological function) or very few locations
- Criterion D: Very small current distribution

In defining ecosystems within the Biodiversity Study Area that trigger CH under the Highly Threatened and/or Unique Ecosystems, Habitats Directive Annex I habitats were considered to be potential critical habitat trigger biodiversity features. In addition, based on the criteria put forward by Rodriguez et al. (2011), habitats that meet the IUCN Red List categories of CR and EN are assessed to be critical habitats, although available data do not allow an assessment to be made against Criterion B, so only Criterion A, C and D have been used.

6.3.2 Critically Endangered (CR) and/or Endangered (EN) Species

IFC PS 6 refers to the IUCN Red List of Threatened Species for determination of Critically Endangered (CR) and Endangered (EN) species. Accordingly, the determination of critical habitat based on other listings is as follows (IFC, 2012a, p.4):

(i) If the species is listed nationally / regionally as critically endangered or endangered, in countries that have adhered to IUCN guidance, the critical habitat determination will be made on a project by project basis in consultation with competent professionals; and

(ii) in instances where nationally or regionally listed species' categorizations do not correspond well to those of the IUCN (e.g., some countries more generally list species as "protected" or "restricted"), an assessment will be conducted to determine the rationale and purpose of the listing. In this case, the critical habitat determination will be based on such an assessment

In determining CR and EN species at the Biodiversity Study Area, the IUCN Red List of Threatened Species, and the only IUCN correspondence in Turkey; the Red Data Book of Turkish Plants (Ekim et al., 2000) have been utilized as the main references. Regional statuses of species, supported by expert judgment on species' current population trends in Turkey, have also been assessed.

6.3.3 Endemic and/or Restricted-Range Species

Endemic species are defined as those that have "…≥ 95% of its global range inside a country or region of analysis", while restricted-range species are listed as the following (IFC, 2012b, p. 25):

- For terrestrial vertebrates, a restricted-range species is defined as those species which have an extent of occurrence of 50,000 km^2 or less.

- For plants, restricted-range species may be listed as part of national legislation. Plants are more commonly referred to as "endemic," and the above-given definition would apply. Particular attention should therefore be paid to endemic plants of smaller countries which are likely, by definition, to be globally rarer and therefore of higher overall priority.

Species identified during terrestrial flora, fauna, as well as avifauna and bat surveys have been assessed to identify whether they meet any of these definitions. The assessment also required a great deal of input from the Project biodiversity experts.

6.3.4 Migratory or Congregatory Species

Migratory birds and bats identified at Kandira Biodiversity Study Area have been assessed against these criteria to identify whether they are critical habitat trigger species.

For (ii) endangered or critically endangered species,
(iii) endemic or geographically restricted species, and
(iv) migratory or congregatory species,

IFC PS 6 also requires that the client determines if the project site is located in a Tier 1 or Tier 2 critical habitat with respect to Criteria 1 through 3. Table 6.1 below presents the quantitative thresholds for Tiers 1 and 2 of these Critical Habitat Criteria (IFC, 2012b, p. 27).

Table 6.1 Quantitative Thresholds for Tier 1 and Tier 2*

Criteria	Tier 1	Tier 2
1. Critically Endangered (CR)/ Endangered (EN) Species	(a) Habitat required to sustain ≥ 10 percent of the global population of a CR or EN species/subspecies where there are known, regular occurrences of the species and where that habitat could be considered a discrete management unit for that species. (b) Habitat with known, regular occurrences of CR or EN species where that habitat is one of 10 or fewer discrete management sites globally for that species.	(c) Habitat that supports the regular occurrence of a single individual of a CR species and/or habitat containing regionally- important concentrations of a Red-listed EN species where that habitat could be considered a discrete management unit for that species/ subspecies. (d) Habitat of significant importance to CR or EN species that are wide-ranging and/or whose population distribution is not well understood and where the loss of such a habitat could potentially impact the long-term survivability of the species. As appropriate, habitat containing nationally/regionally important concentrations of an EN, CR or equivalent national/regional listing.
2. Endemic/ Restricted Range Species	(a) Habitat known to sustain ≥ 95 percent of the global population of an endemic or restricted-range species where that habitat could be considered a discrete management unit for that species (e.g., a single-site endemic).	(b) Habitat known to sustain ≥ 1 percent but < 95 percent of the global population of an endemic or restricted-range species where that habitat could be considered a discrete management unit for that species, where data are available and/or based on expert judgment.
3. Migratory/ Congregatory Species	(a) Habitat known to sustain, on a cyclical or otherwise regular basis, ≥ 95 percent of the global population of a migratory or congregatory species at any point of the species' lifecycle where that habitat could be considered a discrete management unit for that species.	(b) Habitat known to sustain, on a cyclical or otherwise regular basis, ≥ 1 percent but < 95 percent of the global population of a migratory or congregatory species at any point of the species' lifecycle and where that habitat could be considered a discrete management unit for that species, where adequate data are available and/or based on expert judgment. (c) For birds, habitat that meets BirdLife International's Criterion A4 for congregations and/or Ramsar Criteria 5 or 6 for Identifying Wetlands of International Importance. (d) For species with large but clumped distributions, a provisional threshold is set at ≥5 percent of the global population for both terrestrial and marine species. (e) Source sites that contribute ≥ 1 percent of the global population of recruits.

**Adapted from IFC (2012b, p.27)*

The quantitative data on the population of the identified species, along with many of the other assessments made within the scope of Kandira Biodiversity Surveys, were based on expert knowledge and assessments due to the lack of widely accepted and / or published population information.

6.3.5 Key Evolutionary Processes

Evolutionary processes are defined as "…structural attributes of a region, such as its topography, geology, soil, temperature, and vegetation and combinations of these variables can influence evolutionary processes that give rise to regional configurations of species and ecological properties." (IFC, 2012b, p. 29).

Location of the Biodiversity Study Area, thus Project License Area, as an area is not associated with key evolutionary processes. Neither it hosts flora and/or fauna species that have distinct evolutionary histories with populations that show proven phylogenetic divergence from other species' other known populations.

6.3.6 Ecological Functions

IFC PS 6 critical habitat criteria defines ecological functions that are vital to maintaining the viability of biodiversity features, which are identified as critical habitat features, also as a critical habitat criterion, without which critical biodiversity features cannot persist. Some of the examples can be listed as riparian zones and rivers, dispersal or mitigation corridors, hydrological regimes, seasonal refuges or food sources, keystone or habitat-forming species.

Surveys at the Biodiversity Study Area indicate of no such function associated with the existing habitats and ecosystems, that could be assesses as vital to any potential critical habitat features, or any biodiversity feature identified.

6.4 Determination of Critical Habitat Trigger Biodiversity Features

Based on Project Biodiversity Studies and available data, potential biodiversity features that trigger critical habitat are summarized in Table 6.2, followed by assessment on each these features in terms of their characteristics and significance.

Table 6.2 Potential Critical Habitat Trigger Biodiversity Features

Biodiversity Feature	Status	CH as per IFC PS 6
Hypericum aviculariifolium Jaub et Spach subsp. byzantium (Azn.) robson	Endemic and restricted-range species	CH (ii)
Anthemis aciphylla Boiss. var. discoidea Boiss.	Endemic and restricted-range species	CH (ii)

6.4.1 Hypericum aviculariifolium Jaub et Spach subsp. byzantium (Azn.) robson:

Hypericum aviculariifolium Jaub et Spach subsp. byzantium (Azn.) robson species, perennial, semi-shrub. Flowering period is between the fifth and sixth months. As a habitat, they spread at maquis, rocky and Pinus brutia forest areas between 50-700 (1300) meters. In Turkey, they show spread in Istanbul, Bursa and Kocaeli. Since Turkey is in the LC category of plants from the Red Book, there is no need to take any measures to protect the species before and after construction. In the areas where the species is detected, the fertile part of the soil should be stripped, preserved accordingly, and it should be laid as the top layer again when the route is restored. The seeds and roots in the soil will germinate again and accelerate the naturalization of the route.

6.4.2 Anthemis aciphylla Boiss. var. discoidea Boiss.:

Anthemis aciphylla var. discoidea Boiss. species, perennial, with wood base. Flowering period is between the fifth and seventh months. As a habitat, they spread at Quercus sp., Pinus sp., Juniperus sp. and subalpinic bushes that locate in between 350-1600 meters. In Turkey, they spread at Kutahya, Bursa, Manisa and Konya. Since Turkey is in the LC category of plants from the Red Book, there is no need to take any measures to protect the species before and after construction. In the areas where the species is detected, the fertile part of the soil should be stripped, preserved accordingly, and it should be laid as the top layer again when the route is restored. The seeds and roots in the soil will germinate again and accelerate the naturalization of the route.

6.5 Critical Habitat Assessment Conclusions

Critical Habitat Assessment conducted within the scope of Kandira WPP Project Biodiversity Studies indicates that there are no habitats or species within the Biodiversity Study Area, which would qualify the area as critical habitat.

7. PRIORITIES FOR BIODIVERSITY CONSERVATION

7.1 Selection Criteria for Priority Habitats and Species

In the light of the evaluations made in the Ornithological, Ecological Ecosystem Assessment and monitoring studies made under the scope of the Kandira WPP Project, and the analyzes made within the scope of the BAP, habitats and species with high priority and conservation importance were determined in this section.

In order to achieve targeted results, it is one of BAP's objectives to focus on species and habitats that require special management strategies and mitigation measures. Previous chapters of this report presented a number of national and international criteria in terms of evaluation of habitats and species for their threat and conservation statuses. Consequently, all assessments made on biodiversity were based on one or more of these sets of criteria, in their areas of application.

As a result of all the assessments made so far within the scope of Kandira WPP biodiversity studies, below is the list of selection criteria for priority habitats and species to be considered for biodiversity conservation in the action plans prepared within the scope of this document:

- Potential critical habitat trigger species identified as a result of CHA

7.2 Priority Habitats and Species of Conservation Importance

Habitat types and species with high priority and conservation importance are listed in Table 7.1. The conservation of these species requires some specific actions within the scope of the Kandira WPP Project (see Chapter 8).

Table 7.1 Priority habitats and species of conservation importance

Biodiversity Component	Status
Species of Conservation Importance	
Amphibia	
Pelobates syriacus	Plant and animal species of community interest that require stringent conservation measures
Pseudepidalea viridis (=Bufo viridis)	Plant and animal species of community interest that require stringent conservation measures
Hyla arbórea	Plant and animal species of community interest that require stringent conservation measures
Reptiles	
Testudo graeca (Linnaeus, 1758)	Plant and animal species within the area of interest of the community that should be declared a special protected area for protection
Emys orbicularis (Linnaeus, 1758)	Plant and animal species within the area of interest of the community that should be declared a special protected area for protection
Cyrtopodion (=Mediodactylus) kotschyi Steindachner, 1870	Plant and animal species of community interest that require stringent conservation measures
Ablepharus kitaibeili Bibron et Bory, 1833	Plant and animal species of community interest that require stringent conservation measures
Ophisops elegans Menetries, 1832	Plant and animal species of community interest that require stringent conservation measures
Lacerta viridis (Laurenti, 1768)	Plant and animal species of community interest that require stringent conservation measures
Lacerta trilineata Bedriaga, 1886	Plant and animal species of community interest that require stringent conservation measures
Eryx jaculus Linnaeus, 1758	Plant and animal species of community interest that require stringent

Biodiversity Component	Status
	conservation measures
Coluber (=Dolichophis) caspius Gmelin, 1789	Plant and animal species of community interest that require stringent conservation measures
Eirenis modestus (Martin, 1838)	Plant and animal species of community interest that require stringent conservation measures
Natrix natrix (Linnaeus, 1758)	Plant and animal species of community interest that require stringent conservation measures
Natrix tessellata (Laurenti, 1768)	Plant and animal species of community interest that require stringent conservation measures
Mammalia	
Rhinolophus ferrumequinum	Plant and animal species within the area of interest of the community that should be declared a special protected area for protection
Rhinolophus euryale	Plant and animal species within the area of interest of the community that should be declared a special protected area for protection
Rhinolophus hipposideros	Plant and animal species within the area of interest of the community that should be declared a special protected area for protection
Rhinolophus mehelyi	Plant and animal species within the area of interest of the community that should be declared a special protected area for protection
Myotis blythii	Plant and animal species within the area of interest of the community that should be declared a special protected area for protection
Myotis capaccinii	Plant and animal species within the area of interest of the community that should be declared a special protected area for protection
Myotis emarpinatus	Plant and animal species within the area of interest of the community that should be declared a special protected area for protection
Myotis myotis	Plant and animal species within the area of interest of the community that should be declared a special protected area for protection
Sciurus anomalus	Plant and animal species of community interest that require stringent conservation measures
Dryomys nitedula	Plant and animal species of community interest that require stringent conservation measures
Muscardinus avellnarius	Plant and animal species of community interest that require stringent conservation measures
Lynx lynx	Plant and animal species within the area of interest of the community that should be declared a special protected area for protection, Plant and animal species of community interest that require stringent conservation measures
Felis silvestris	Plant and animal species of community interest that require stringent conservation measures
Birds	
Ciconia nigra	Species subject to special protection measures regarding their habitats in order to ensure their survival and survival in their range
Ciconia ciconia	Species subject to special protection measures regarding their habitats in order to ensure their survival and survival in their range
Pernis apivorus	Species subject to special protection measures regarding their habitats in order to ensure their survival and survival in their range
Circaetus gallicus	Species subject to special protection measures regarding their habitats in order to ensure their survival and survival in their range
Circus aeruginosus	Species subject to special protection measures regarding their habitats in order to ensure their survival and survival in their range
Accipiter nisus	Species subject to special protection measures regarding their habitats in order to ensure their survival and survival in their range
Bufeo rufmus	Species subject to special protection measures regarding their habitats in order to ensure their survival and survival in their range
Clanga pomarina	Species subject to special protection measures regarding their habitats in order to ensure their survival and survival in their range
Caprimulgus europaeus	Species subject to special protection measures regarding their habitats in order to ensure their survival and survival in their range
Dendrocopos major	Species subject to special protection measures regarding their habitats

Biodiversity Component	Status
	in order to ensure their survival and survival in their range
Dendrocopos syriacus	Species subject to special protection measures regarding their habitats in order to ensure their survival and survival in their range
Dendrocopos medius	Species subject to special protection measures regarding their habitats in order to ensure their survival and survival in their range
Lullula arbórea	Species subject to special protection measures regarding their habitats in order to ensure their survival and survival in their range
Troglodytes troglodytes	Species subject to special protection measures regarding their habitats in order to ensure their survival and survival in their range

8. HABITATS AND SPECIES ACTION PLANS

8.1 BAP Actions

One of the objectives of the BAP is “formulating specific BAP actions to be implemented for biodiversity conservation”, after all priorities are identified. Each action plan developed within the scope of this chapter put forward a set of action specifying exactly what needs to be done during which time frame.

BAP actions are designed to be open-ended, given that with additional research and progress of the Kandira WPP Project, they will be updated and improved. The mitigation hierarchy will be followed strictly and all necessary measures of avoidance, minimization and mitigation will be taken. When necessary, offsets in addition to the ones put forward within the scope of this document will also be considered throughout the life-cycle of the Project.

There are five action plans presented in the remainder of this chapter, namely;

- Action Plan for Mammals and Reptiles of Conservation Importance
- Action Plan for Birds of Conservation Importance

8.1.1 Action Plan for Mammals, Reptiles and Amphibians of Conservation Importance

For protection of mammal and reptile species from impacts of project-related construction activities, the following general mitigation measures will be taken targeting all mammal species identified within the biodiversity study area:

- Local people and project staff will be trained in terms of sensitivities of mammals and reptiles and how they can contribute to conservation efforts
- If encountered during constructions mammals will either be transferred to safer locations, or allowed enough time to leave the site
- Construction activities will be limited during the breeding season of mammals
- Relevant construction sites will be fenced avoiding any fauna species passing through
- Secondary impacts on species implementing noise, dust, wastewater and waste management plans
- Vehicle movement will be restricted to designated routes that will be minimized
- No hunting or poaching will be allowed (Already forbidden by law, necessary measures to be taken by Saganak)

There are eight bat species in the biodiversity study area which are listed in Annex II of the Habitats Directive, which require establishment of special areas of conservation, in the event that their populations are at stake. Additional monitoring studies are required to make a more detailed assessment of the population status of the bat species in question and their areas. According to the results of the monitoring studies, if the habitats of bats are located in areas that will be inundated or will be affected by road and ETL construction, bat boxes will be placed where necessary, considering the sensitivity of the species.

The existence of *Lynx lynx* species evaluated in Habitat Directive Annex-II and IV is based on literature records only. Their presence in the biodiversity study area should be confirmed with monitoring studies, if possible with a photo trap. Actions taken within the framework of the BAP will be updated according to the results of additional monitoring studies and relevant mitigation measures will be developed and presented within the scope of the BAP.

Testudo graeca and *Emys orbicularis* species are listed in the Habitat Directive Annex-II. Testudo graeca are also in the "VU: Sensitive" category according to the IUCN Red List. Testudo graeca, despite being widely distributed in Turkey is sensitive to the origin of the project activities due to limited mobility. If possible impacts are prevented or mitigated according to the Action Plan, no residual impacts are expected on any of these species.

Objective: Conserve mammal and reptile species populations and habitats

Biodiversity Component	Target	Action	Timeline	Responsibility/ Partnership	Indicator
Rhinolophus ferrumequinum, *Rhinolophus euryale,* *Rhinolophus hipposideros,* *Rhinolophus mehelyi,* *Myotis blythii,* *Myotis capaccinii,* *Myotis emarpinatus,* *Myotis myotis*	No net loss of species populations or habitats No net loss of species populations or habitats No net loss of species populations	Conducting monitoring at the biodiversity study area to determine locations of inhabitance and acquire data on their populations	During construction	Saganak / Expert zoologist	Identification of bat populations
		If bat habitats are compromised, placing bat boxes at appropriate locations	During construction	Saganak / Expert zoologist	Inhabitance of bat boxes by bat populations
		Minimizing noise and light generation due to project activities that might interfere with bat behavior	During construction	Saganak	Noise and light due to project activities are controlled by taking necessary measures
		Prevent entrance of bats into working places	During construction	Saganak	No accidental mortality of bats
Testudo graeca	No net loss of species populations or habitats	Transfer to safer locations if encountered during construction	During construction	Saganak / Expert zoologist	No accidental mortality of *Testudo graeca*
Emys orbicularis	No net loss of species populations or habitats	Transfer to safer locations if encountered during construction	During construction	Saganak / Expert zoologist	No accidental mortality of *Emys orbicularis*

8.1.2 Action Plan for Bird Species of Conservation Importance

Scientific research and experience to date, the main potential harmful effects of wind power plants on birds (*Hotkerve et al, 2004*) are described below in articles (prose). In this section, the possible impacts are written in prose, *evaluation and mitigation measures in terms of these project sites and determined birds (ornithologically) are written as "italic".*

- Bird collisions with moving turbine propellers, structures such as turbine towers, tension lines or wind rudders behind the propellers cause direct fatal accidents. *Moderate number of bird species, which are widely distributed species and not included in the danger categories except for two, were identified in the project sites. In addition, it has been determined that most of the bird species likely to be found in the areas where the turbines will be installed at Kandira WPP project sites are those that feed from the ground and do not make long-high altitude flights. From these points of view, it is expected that the project sites are not an important bird area in terms of feeding, sheltering and breeding activities of the birds, and the risk of hitting the propellers is low due to the fact that most of them are ground birds that do not fly at long distances and high altitudes. This situation suggests that these negative impacts may be low on the birds in the project sites.*

- Birds appear to be displaced in the areas around the turbines due to disturbance or completely leaving the area where the wind turbines are located. *During the construction and operation phase of the project, due to the disturbances in the areas around the wind turbines, birds may leave the area. However, this effect (leaving the area) is expected to be reversible since the majority of the birds in these project sites are ground birds and native bird species. In the current situation, it has been observed that these birds did not leave the area, despite the intensive livestock breeding, transhumance, agricultural activities and related human-induced birds in the project areas. In addition, there are similar and suitable alternative areas in the immediate environment, which have sufficient ecological carrying capacity for the birds that will leave the region due to the impacts that may occur with the project activities. In this case, since the birds that will leave the area are mobile creatures, it should be expected to eliminate the negative effects by going to these similar and suitable alternative areas in the near environment. Many ground and wood birds are also expected to return to the project sites, especially after the construction is finished and the turbines are operational.*

- When birds are removed from their preferred habitat and cannot find alternative areas suitable for them, their reproductive efficiency or survival rate may decrease. *There are similar and suitable alternative areas in the immediate environment with sufficient ecological carrying capacity for the birds that will leave the region due to the impacts that may occur with the project activities. Therefore, a reduction in the reproductive efficiency and / or survival rate of birds is not expected.*

- The cause of the disturbance may be the presence of turbines and / or maintenance vehicles and people, as well as the construction processes of wind turbines. *In this context, it should be ensured that construction activities are carried out gradually in order to provide the time and energy required for the birds to escape to suitable alternative areas outside the construction sites in order to reduce the adverse effects on the reproductive efficiency or survival of the birds. Apart from this, construction personnel should be informed and made aware of these species. The presence of highland and forest roads at Kandira WPP sites that can reach most of the turbines shows that there will not be much damage during road construction. In road widening works, the width rule of Nature Conservation and National Parks should be followed.*

- Wind power plants can affect the ecological links between birds' feeding, wintering, breeding and moulting areas, and impose restrictions on bird movement by preventing long flights around wind farms. *This increases the energy needs of birds and negatively affects their health (Large wind power plants or the total impact of multiple wind power plants are the most important concerns). Within the scope of this project, the areas where wind turbines will be installed are not an ecosystem that is among the many wintering-breeding-moulting areas identified in the area. Since the vast majority of existing bird species in the project sites are birds that feed from forest areas and do not make long-high altitude flights, it is not expected that the birds will prevent long flights around the wind turbines and impose restrictions on the movement of the birds.*

- Habitats may change or disappear due to wind turbines and associated infrastructure. *Within the scope of this project, habitat changes and / or areas to be eliminated are limited to areas where turbines will be erected and transformer buildings will be installed, not the entire license area. In addition, the fact that the project sites generally have a uniform cover supports the potential of the vegetation that may change during construction to be rapidly reversible. Therefore, no habitat change and / or habitat loss is expected outside the areas where the turbines and switchyard will be established. Due to habitat changes and losses, there are similar and suitable alternative areas in the immediate environment with sufficient ecological carrying capacity for birds leaving the area.*

Biodiversity Component	**Target**	**Action**	**Timeline**	**Responsibility/ Partnership**	**Indicator**
Ciconia nigra, *Ciconia ciconia,* *Pernis apivorus,* *Circaetus gallicus,* *Circus aeruginosus,* *Accipiter nisus,* *Bufeo rufmuş,* *Clanga pomarina,* *Caprimulgus europaeus,* *Dendrocopos majör,* *Dendrocopos syriacus,* *Dendrocopos medius,* *Lullula arbórea,* *Troglodytes troglodytes*	No net loss of species populations	Painting Turbine Poles and Propellers	During construction	Saganak	Conservation of species populations and their habitats
		Lighting of the Turbines	During construction	Saganak	Conservation of species populations and their habitats
		Keeping a Distance between Turbines	During construction	Saganak	Conservation of species populations and their habitats
		Monitoring and Reporting of Populations	During construction and operation	Saganak	Conservation of species populations and their habitats

9. MONITORING, REPORTING AND FOLLOW-UP STUDIES

9.1 Monitoring of BAP Actions

9.1.1 Monitoring Objectives

The main objective of the Biodiversity Monitoring Program (BMP) is to monitor the status of biodiversity components and the extent of implementation of BAP actions, with respect to project activities and human interference. Continuous monitoring of BAP actions is crucial in reaching success of defined actions and meeting conservation objectives. Monitoring activities must be undertaken during and after construction to assess the status of biodiversity components so as to adopt additional measures whenever unanticipated impacts arise. Kandira WPP BAP will reflect changes in the following factors to assess the effectiveness of BAP actions:

- Status and trends of the nation's use of terrestrial and aquatic resources, habitats, species, populations, genes, biodiversity.
- Shifts in certain social, political and economic factors.
- Shifts in human, institutional, facility and funding capacity, including cultural practices and norms, technology, training and education, information availability, management, and monitoring capacity.
- Changes on in the legal framework for biodiversity conservation,
- Changes in the use of biological resources and their sustainability at local or national levels
- Impacts of implementing the BAP on biodiversity components

Some of the monitoring requirements for construction and operation phases of the Project were already identified as part of the design studies. During project construction and operation, monitoring will be a part of ensuring compliance with all relevant legislation, contract requirements and effective implementation of BAP actions.

9.1.2 Monitoring Timeline

In the scope of this Plan prepared for Kandira WPP, regular monitoring activities will be carried out in order to assess the level of implementation of the mitigation measures identified for the Project for land preparation, construction and operation phases. Monitoring plan is defined in the Table 9.1 below.

Table 9.1 Monitoring Plan

Project Phase	Monitoring Parameter/ Performance Indicator	Monitoring Station /Location	Monitoring Method	Monitoring Frequency	Responsibility
Construction and Operation Phases	Terrestrial habitat and flora species	Project site	Observation	Annually	Saganak / Expert botanist
	Terrestrial fauna species (mammals and reptiles)	Project site	Observation	Annually	Saganak / Expert zoologist
	Bird species	Vantage points Carcass searches at Project site	Observation	15 days in spring 15 days in autumn	Saganak / Expert ornitologist
Operation	Bat species	Carcass searches at Project site	Observation	Biannual	Saganak / Expert zoologist

9.2 Reporting

The BAP was prepared with the best available data on Kandira WPP Project. This report requires continuous reviewing and updating through different phases of the Project, as conditions at the biodiversity study area change and more data become available, Actions defined in this BAP will also be restructured in case there is a need to take more stringent measures in terms of biodiversity conservation.

Internal reporting requirements will be specified by Saganak, depending on how the site will be managed, and consultants will report to Saganak as the BAP is implemented. Monitoring reports and updates on the BAP will also be made available to related governmental agencies and other interested parties.