iZDEMiR ENERJi

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İzdemir Enerji A.Ş Biodiversity Monitoring Report at International Standards

ÇINAR® ENGINEERING CONSULTANCY INC.

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ABBREVIATION AND ACRONYMS

Ann.   Annex

AZE   The Alliance for Zero Extinction

CBD   Convention on Biological Diversity

CITES Regulation on the Implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora

CORINE   Coordination of Information on the Environment

CR   Critically Endangered

DD   Data Deficient

EC   European Commission

EN   Endangered

EU   European Union

EUNIS   European Nature Information System

EW   Extinct in the Wild

EX   Extinct

GIS   Geographic Information Systems

GMOs   Genetically Modified Organisms

IAS   Invasice Alien Species

IBAs   Important Bird Areas

IFC   International Finance Corporation

INAs   Important Natural Areas

IPAs   Important Plant Areas

ISSG   Invasive Species Specialist Group

IUCN   International Union for Conservation of Nature

LC   Least Concern

M.Sc.c.   Master of Science candidate

MAB   Man and the Biosphere

MAKK   Central Hunting Commission Decisions

MPAs   Marine Protected Areas

NE   Not Evaluated

NT   Near Threatened

Ph.D.   Doctor of Philosophy

PS6   Performance Standard 6

SEPA   Special Environmental Protection Areas

UNEP   United Nations Environment Programme

UNESCO   United Nations Educational, Scientific and Cultural Organization

VU   Vulnerable

1.INTRODUCTION

This report was prepared by Edanur BİNGÖL (Expert Biologist) and Gamze KAYA (Expert Biologist) with the aim of assessing the sustainability of flora and fauna within the facilities of İzdemir Enerji A.Ş., located within the administrative boundaries of Aliağa District, İzmir Province.

Within this scope, field surveys were conducted both within and around the facilities on 03.07.2025 and 04.07.2025 by Expert Biologist Edanur BİNGÖL. The locations of the facilities are presented in Map 1, and visual records of the relevant facility are provided in Photographs 1–5.
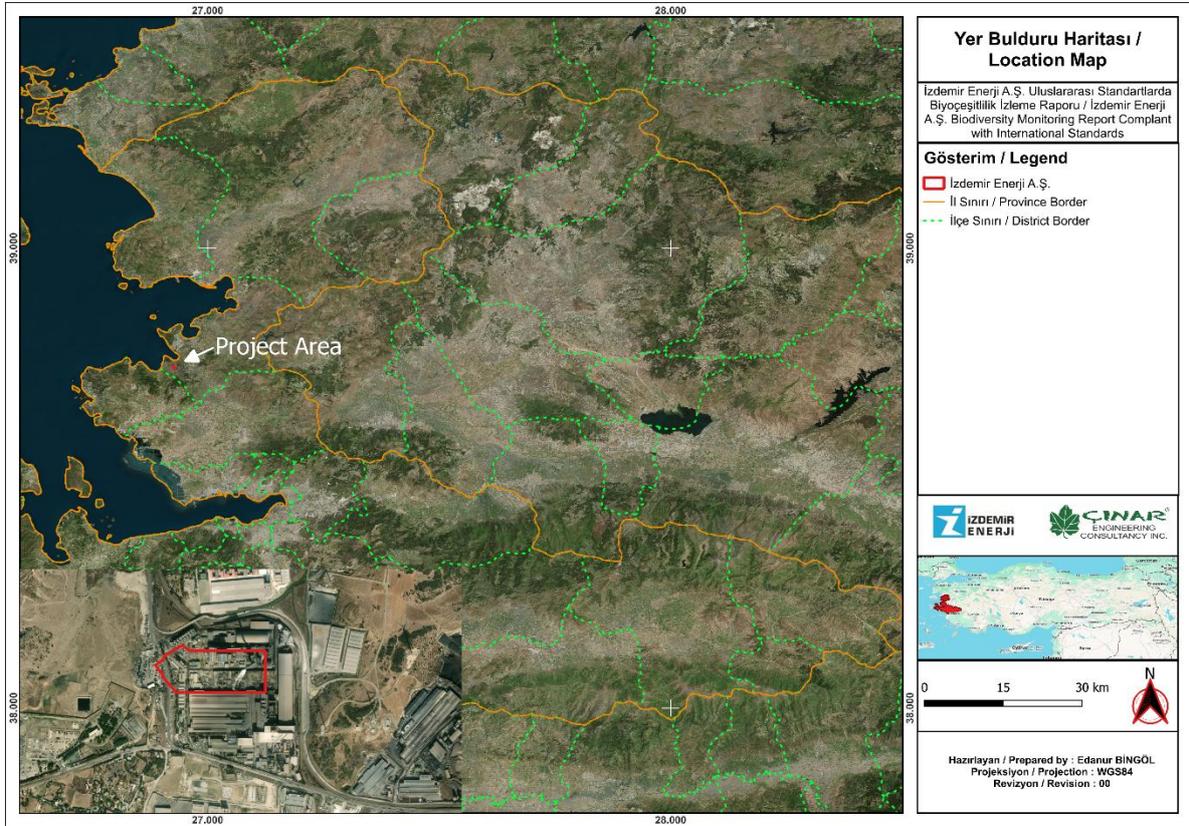
Map 1 Location Map

1.1. PURPOSE

This report has been prepared to support the development of strategic approaches for the conservation and sustainable use of biodiversity, in line with international best practice and the principles of IFC Performance Standard 6. It aims to provide a comprehensive assessment of the current status of biodiversity in order to ensure the sustainable management of ecosystem services, to systematically identify existing and potential threat factors, and to inform the formulation of effective conservation and management policies at both national and international levels. In addition, the report seeks to present a science-based roadmap that promotes the enhancement of ecosystem resilience to environmental stressors, including climate change, habitat degradation, and anthropogenic pressures.

1.2. SCOPE

This report covers the fundamental principles and practices related to the sustainable management of biodiversity. The assessment addresses multiple levels of biodiversity, including species diversity and ecosystem diversity, with a focus on conservation and sustainable use strategies. Through a multidimensional evaluation, the report presents integrated and holistic approaches aimed at the conservation and long-term sustainability of these ecosystems.

2. RELEVANT LEGİSLATİON AND STANDARDS

National and international standards related to biodiversity have generally been developed within the framework of objectives aimed at sustainable development, conservation of natural resources, and ensuring the continuity of ecosystem services. The prominent national and international standards related to biodiversity and their explanations are presented below.

2.1. National Legislations

1. **Regulation on the Implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)**

Content, Purpose, and Scope: The purpose of this regulation is to establish the procedures and principles for controlling international trade in endangered species of wild fauna and flora, in cooperation with relevant institutions and organizations, in accordance with the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). This is to ensure the sustainable use of these species.

Annexes and Explanations: This regulation outlines the procedures and principles for controlling the international trade of specimens defined in Article 4 of the regulation, within the framework of CITES.

Effective Dates and Official Gazette Reference: It was published in the Official Gazette dated December 27, 2001, with issue number 24623.

2. **Regulation on the Harvesting, Production, and Export of Natural Flower Bulbs**

Content, Purpose, and Scope: The purpose of this regulation is to regulate the procedures and principles related to the direct collection, production, harvesting, storage, and export of seeds, bulbs, or other parts of naturally occurring bulbous plants, while also ensuring the protection of these species.

Annexes and Explanations: This regulation covers plant species containing bulbs, tubers, and rhizomes, whether they occur naturally or not.

Effective Dates and Official Gazette Reference: It was published in the Official Gazette dated July 19, 2012, with issue number 28358.

3. **Law on the Protection of Breeder's Rights for New Plant Varieties (5042-08.01.2004) and Regulations**

Content, Purpose, and Scope: The purpose of this law is to encourage the development of plant varieties and to protect the rights of breeders, ensuring the protection of new varieties. This law applies to all plant species.

Effective Dates and Official Gazette Reference: It was published in the Official Gazette dated August 12, 2004, with issue number 25551.

4. Seed Certification Law (5553-31.10.2006)

Content, Purpose, and Scope: The purpose of this law is to increase productivity and quality in plant production, ensure quality assurance in seed production, regulate seed production and trade, and implement necessary measures for the restructuring and development of the seed sector.

Annexes and Explanations: This law covers regulations related to the registration of genetic resources and varieties of propagation materials for field crops, vines, orchard plants, forestry plants, and other plant species; seed production, certification, market inspection, and institutional restructuring.

Effective Dates and Official Gazette Reference: It was published in the Official Gazette dated November 8, 2006, with issue number 26340.

5. Pasture Law (4342-25.02.1998) and Regulations

Content, Purpose, and Scope: The purpose of this regulation is to set out the procedures and principles for the amendment of certain articles of the Grazing Law (No. 4342) dated February 25, 1998, and Law No. 4368 dated June 11, 1998.

Annexes and Explanations: This regulation covers pastures, highlands, wintering grounds, and public meadows and grazing lands.

Effective Dates and Official Gazette Reference: It was published in the Official Gazette dated February 28, 1998, with issue number 23272

6. Forest Law No. 3071 and Implementation Regulations

Content, Purpose, and Scope: This law establishes the principles related to forest management, including forest planning, operation, and conservation.

Effective Dates and Official Gazette Reference: It was published in the Official Gazette dated August 29, 2013, with issue number 28750.

7. Plant Protection and Phytosanitary Law (6968-15.05.1957)

Content, Purpose, and Scope: This law covers the use, sale, production, export, and import of agricultural pest control tools and chemicals; the protection of plants from diseases and pests; and the procedures and principles related to the movement, export, and import of these plants within the country.

Effective Dates and Official Gazette Reference: It came into effect on December 22, 2000.

8. Hunting Law (Law No. 4915)

Content, Purpose, and Scope: The purpose of this law is to protect Türkiye's wildlife and ensure its sustainable management, to take necessary conservation measures for the survival of wildlife species, and to regulate hunting activities. It covers procedures and principles related to hunting, breeding, protection, and sustainable use of wildlife, as well as hunting licenses, hunting bans, protected species, and hunting conservation areas.

Effective Dates and Official Gazette Reference: It came into force on July 1, 2003.

9. **National Parks Law (Law No. 2873)**

Content, Purpose, and Scope: The purpose of this law is to ensure the protection and management of national parks, nature parks, nature monuments, and nature conservation areas, and to protect the wildlife and biodiversity within these areas. It aims to preserve natural beauty and ecosystems and prevent the destruction of wildlife habitats within protected areas.

Effective Dates and Official Gazette Reference: It came into force on August 9, 1983.

10. **Environmental Law (Law No. 2872)**

Content, Purpose, and Scope: This law regulates the necessary measures for the protection of the natural environment, biodiversity, and wildlife. It encompasses the reduction of environmental impacts, prevention of pollution, and the protection and improvement of wildlife habitats.

Effective Dates and Official Gazette Reference: It came into force on August 9, 1983.

11. **Fisheries Law (Law No. 1380)**

Content, Purpose, and Scope: This law aims to protect the biological diversity and wildlife of water bodies, regulate the hunting of wild aquatic species, and combat illegal fishing. It covers the protection and sustainable use of wildlife in aquatic ecosystems.

Effective Dates and Official Gazette Reference: It came into force on April 4, 1971.

12. **Regulation on the Protection of Wetlands**

Content, Purpose, and Scope: This regulation aims to protect the ecological characteristics of wetlands and the wildlife within them, ensuring the protection of natural habitats for wildlife. It imposes restrictions on hunting, construction, and other human activities in wetland areas.

Effective Dates and Official Gazette Reference: It came into force on May 17, 2005.

13. **Animal Protection Law (Law No. 5199)**

Content, Purpose, and Scope: This law aims to protect the rights to life of all animals, including wildlife, and to prevent the removal of wild animals from their natural habitats and their exposure to mistreatment.

Effective Dates and Official Gazette Reference: It came into force on June 24, 2004.

2.2. International Legislations

1. **CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora)**

Adoption Date: March 3, 1973

Purpose: To regulate international trade in endangered wild animal and plant species and prevent their extinction.

Scope: The trade control includes three appendices:

Appendix I: Species whose trade is entirely prohibited.

Appendix II: Species for which trade is permitted under specific conditions.

Appendix III: Species protected in specific countries, requiring international cooperation for trade control.

Türkiye's Participation: Türkiye became a party to CITES in 1996.

2. **Ramsar Convention (Convention on Wetlands of International Importance)**

Adoption Date: February 2, 1971

Purpose: To ensure the conservation and sustainable use of wetlands and to protect wildlife, especially migratory bird species, in wetland habitats.

Scope: Protects wetlands designated as Ramsar Sites, recognized for their international importance.

Türkiye's Participation: Türkiye signed the Ramsar Convention in 1994.

3. **Bern Convention (Convention on the Conservation of European Wildlife and Natural Habitats)**

Adoption Date: September 19, 1979

Purpose: To protect wildlife species and their habitats in Europe, including the conservation of endangered species and the prevention of illegal hunting.

Scope: Covers endangered animal and plant species, as well as their habitats in participating countries.

Türkiye's Participation: Türkiye became a party to the Bern Convention in 1984.

4. **Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals)**

Adoption Date: June 23, 1979

Purpose: To conserve migratory species, improve their habitats, and promote international cooperation along migratory routes.

Scope: Includes various animal groups, such as migratory birds, fish, mammals, and marine species.

Türkiye's Participation: Türkiye became a party to the Bonn Convention in 1994.

5. Convention on Biological Diversity (CBD)

Adoption Date: June 5, 1992 (at the Rio Earth Summit)

Purpose: To conserve biological diversity, ensure the sustainable use of natural resources, and promote the fair and equitable sharing of benefits arising from genetic resources.

Scope: Covers wildlife, agricultural biodiversity, and genetic resources.

Türkiye's Participation: Türkiye became a party to the CBD in 1997.

6. Paris Climate Agreement

Adoption Date: December 12, 2015

Purpose: To reduce the effects of climate change and limit its adverse impacts on biodiversity, while supporting the protection of wildlife species threatened by climate change.

Türkiye's Participation: Türkiye ratified the agreement in 2021.

7. IUCN Red List (International Union for Conservation of Nature Red List of Threatened Species)

Purpose: To assess the global conservation status of species and create roadmaps for the conservation of threatened species.

Scope: Includes the conservation statuses of wildlife species worldwide (Critically Endangered, Endangered, Vulnerable, etc.).

Categories and Explanations:

EX: Extinct

EW: Extinct in the Wild

CR: Critically Endangered

EN: Endangered

VU: Vulnerable

NT: Near Threatened

LC: Least Concern

DD: Data Deficient

NE: Not Evaluated

8. **Cartagena Protocol on Biosafety**

Adoption Date: 2000

Purpose: To prevent the potential harmful effects of genetically modified organisms (GMOs) on biodiversity and to support wildlife conservation efforts at the genetic level.

Türkiye's Participation: Türkiye signed the Cartagena Protocol in 2003.

3. BIODIVERSITY SURVEY AREA

The effective and efficient implementation of biodiversity surveys is largely dependent on the accurate delineation of the study area. The selection of an area with appropriate characteristics not only facilitates the achievement of research objectives but also significantly contributes to a comprehensive understanding of biodiversity components and ecosystem processes. Accordingly, the determination of the study area was based on the criteria outlined below.

1. Biodiversity Level

The study area should preferably be characterized by high biodiversity value in terms of target species, habitats, or ecosystems. Areas supporting rare, endemic, or threatened species should be prioritized.

2. Ecological Representativeness

The selected area should be representative of the characteristic features of a particular ecosystem or habitat type. This approach enhances the generalizability of research findings and allows for a comprehensive and integrated understanding of ecological processes.

3. Conservation Status

The legal protection status of the study area and the existing conservation measures should be reviewed. Legally protected areas offer advantages in terms of minimizing external disturbances.

4. Accessibility and Logistical Feasibility

Logistical factors such as ease of access, transportation options, climatic conditions, and the physical characteristics of the area should be evaluated to ensure the feasibility and sustainability of field studies.

5. Anthropogenic Pressures

Areas subject to intense human-induced pressures may exert significant stress on biodiversity. The presence and intensity of such pressures should be considered in line with the objectives of the assessment.

6. Availability of Data and Literature

The availability of existing data and literature related to the study area is important for the planning and interpretation of the assessment. Previously studied areas may also enable long-term monitoring and trend analysis.

7. National and International Conservation Priorities

The selection of the study area should be aligned with national and international conservation priorities. Areas of global importance, such as Ramsar Sites, UNESCO World Heritage Sites, or Biosphere Reserves, may be given priority where applicable.

8. Research Objectives and Hypotheses

The selection of the study area should be directly aligned with the defined research objectives and hypotheses to be tested. Depending on the scope of the study, specific species, habitats, or ecological processes may be prioritized.

9. Social and Economic Factors

The economic activities of local communities and the presence of traditional knowledge within the study area may influence the effectiveness and success of biodiversity assessments. In this context, engagement and cooperation with local stakeholders are considered important.

10. Time and Resource Constraints

The selection of the study area should take into account the time frame and budget allocated for the study. Factors such as excessive transportation and equipment costs may influence the final selection.

Biodiversity assessments in industrial areas are of critical importance for analyzing the environmental impacts of industrial activities and for developing strategies aimed at biodiversity conservation and management. Within this scope, a 100 m-wide study corridor was delineated for the Akdemir Çelik A.Ş. facilities located within the administrative boundaries of Aliağa District, İzmir Province. The biodiversity study area is presented in Map 2.
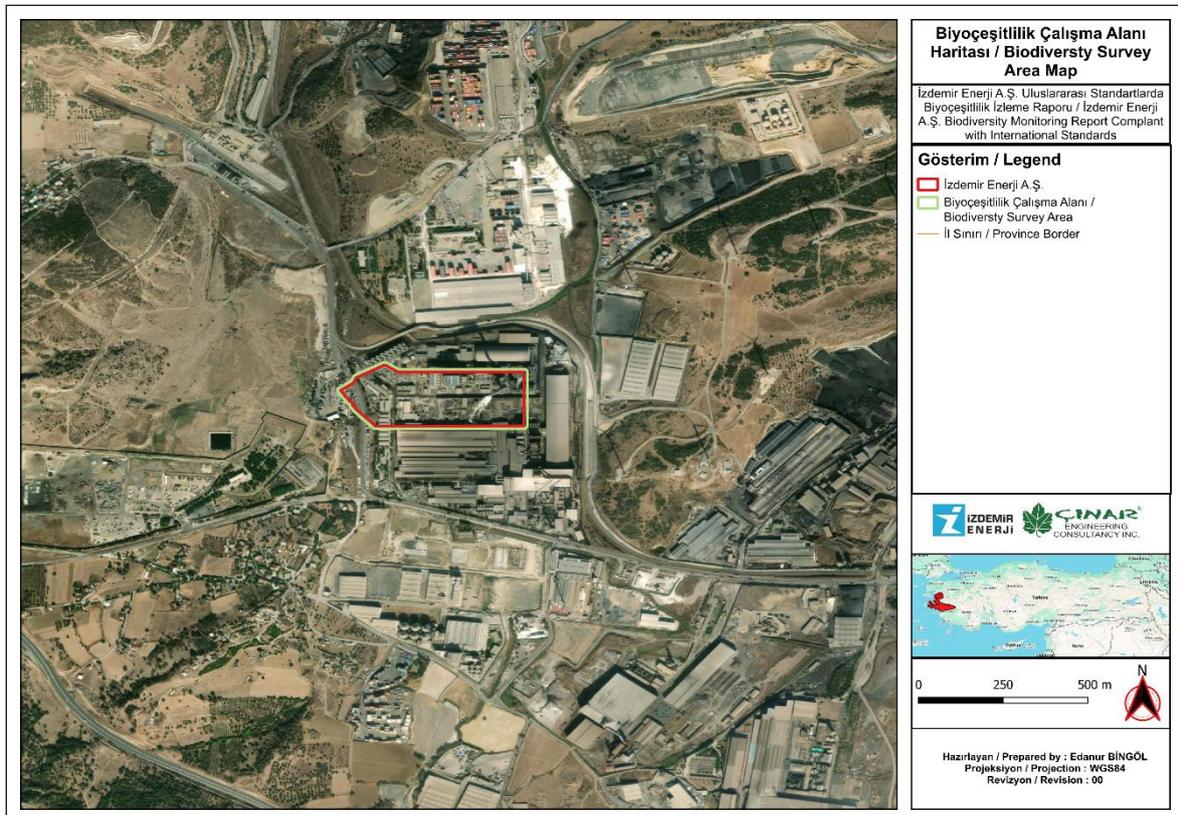
Map 2 Biodiversty Survey Area Map

4. PROTECTED AREAS

Protected areas are terrestrial, marine, and freshwater areas that have been legally or administratively designated to conserve nature and biodiversity. According to the definition provided by the International Union for Conservation of Nature (IUCN), protected areas are geographical regions managed with specific conservation goals to ensure the long-term protection of ecosystems, habitats, and species.

Protected areas aim not only to conserve biodiversity but also to support the sustainable use of natural resources and the cultural and economic values of local communities.

International protected areas are generally managed within the framework of international agreements or collaborations, covering multiple countries or globally significant ecosystems. The main categories are as follows:

1. **UNESCO World Heritage Areas**

These areas are selected for the universal protection of cultural and natural heritage

2. **Biosphere Reserves (MAB Program)**

These areas, designated under UNESCO's Man and the Biosphere (MAB) program, promote the conservation of biodiversity and harmony between humans and nature.

3. **Ramsar Sites (Wetlands)**

These are wetlands of international importance designated under the Ramsar Convention, which need to be preserved.

4. **Peace Parks**

Transboundary protected areas are established to promote peace and cooperation between two or more countries.

5. **IUCN Categories of Protected Areas**

Protected areas are classified into six categories according to their degree of protection and management objectives:

- **Category Ia (Strict Nature Reserves):** Areas with restricted access for research and conservation purposes.
- **Category Ib (Wilderness Areas):** Areas with minimal human intervention, preserving their wild state.
- **Category II (National Parks):** Areas set aside for the protection of ecosystems, open to the public.
- **Category III (Natural Monuments):** Smaller areas preserving specific natural features.
- **Category IV (Habitat/Species Management Areas):** Areas focused on the protection of specific species or habitats.
- **Category V (Protected Landscapes/Seascapes):** Areas where human activities are balanced with conservation.
- **Category VI (Sustainable Use of Natural Resources Areas):** Areas designated for sustainable natural resource management.

Importance of Protected Areas

Conservation of Biodiversity: Protected areas provide critical defense against threats such as habitat loss, species decline, and climate change.

Ecosystem Services: They offer important ecosystem services such as water conservation, soil erosion prevention, and carbon sequestration.

Cultural and Economic Values: Natural areas help conserve the cultural heritage of local communities and provide opportunities for ecotourism and other economic benefits.

Research and Education: They provide safe spaces for scientific research and contribute to knowledge dissemination.

Future Perspectives

To increase the effectiveness of protected areas, the following strategies are recommended:

Transboundary Cooperation: Enhancing international coordination.

Local Participation: Involving local communities in management processes.

Use of Technology: Strengthening monitoring using remote sensing, artificial intelligence, and Geographic Information Systems (GIS).

Financial Mechanisms: Increasing contributions from international funds and the private sector.

Globally, protected areas play a vital role in conserving biodiversity and promoting sustainable development. However, the development of effective management and sustainable conservation strategies is crucial to ensure that these areas remain effective in the future.

Protected Areas Worldwide

Globally, protected areas are significant geographical regions aimed at conserving biodiversity and ensuring the sustainable management of ecosystems. As of 2021, according to the International Union for Conservation of Nature (IUCN), approximately 15% of the world's land surface and 7.5% of marine areas are covered by protected areas. These figures show a significant increase from 2000, when the coverage was 10% and 1.5%, respectively. However, these percentages still need to be increased to meet global biodiversity conservation targets.

Protected areas include categories such as national parks, nature reserves, biosphere reserves, and Ramsar sites. For example, natural sites on the UNESCO World Heritage List play a crucial role in protecting globally significant ecosystems, with over 250 natural sites currently on the list.

Protected Areas in Türkiye

Türkiye is a country distinguished by its rich biological diversity and hosts a wide range of ecosystems as a result of its geographical and climatic heterogeneity. The number and extent of protected areas in Türkiye reflect the maturity of the country's nature conservation strategies and its achievements in biodiversity conservation.

As of 2024, a total of 3,769,916 hectares of protected areas have been designated across Türkiye. These areas encompass a broad spectrum of protection categories managed by the General Directorate of Nature Conservation and National Parks, including National Parks, Nature Parks, Strict Nature Reserves, Wildlife Development Areas, Wetlands of Local Importance, Wetlands of National Importance, Natural Monuments, and other conservation designations. In addition, Special Environmental Protection Areas designated and managed by the General Directorate for the Protection of Natural Assets are also included within this framework.

Size and Percentage Distribution of Protected Areas

Despite the increase in the global coverage of protected areas, current levels remain below internationally agreed conservation targets. In line with the objectives set out under the United Nations Sustainable Development Goals, it is planned that 30% of the Earth's land and marine surface will be placed under protection by 2030.

In Türkiye, protected areas currently account for approximately 5% of the country's total surface area. This proportion indicates a need for further strengthening national strategies, legal frameworks, and institutional capacity aimed at the conservation of biodiversity.

Protected areas play a critical role in biodiversity conservation and the sustainable management of ecosystems. Although the global extent of protected areas has increased, further expansion and the adoption of effective and adaptive management strategies are required. Similarly, in Türkiye, enhancing both the extent and diversity of protected areas is essential to ensure long-term ecosystem sustainability. In this context, national and international cooperation, supported by scientific research and capacity-building and education programs, has the potential to significantly improve the effectiveness of conservation efforts.

4.1. NATIONAL PROTECTED AREAS

Protected areas in Türkiye are classified into various categories designated under national nature conservation laws and regulations, with the aim of conserving biodiversity and supporting ecosystem sustainability. Below, the main categories of protected areas in Türkiye and their detailed descriptions are presented.

1. **National Parks**

National Parks are designated areas established to conserve natural environments and ensure the sustainable use of natural resources, while also promoting environmental education and ecotourism. Türkiye currently has 42 National Parks, which aim to protect a wide range of ecosystems and rare species across the country.

2. **Nature Parks**

Nature Parks are areas designated to promote the conservation of natural landscapes and ecosystems. There are more than 500 Nature Parks in Türkiye. These areas support the protection of local ecosystems, ecotourism activities, and nature-based education.

3. Natural Monuments

Natural Monuments are areas characterized by unique natural formations or rare and protected tree and plant species of special value. Türkiye has more than 300 Natural Monuments, which are subject to special protection and monitoring measures.

4. Strict Nature Reserves

These areas are designated to ensure the protection of ecosystems, rare species, and critical habitats. They are generally allocated for scientific research, ecological monitoring, and ecosystem restoration activities, with restricted human access.

5. Special Environmental Protection Areas

Special Environmental Protection Areas are designated regions where specific conservation measures are implemented to protect ecosystems and biodiversity under defined management plans. In Türkiye, these areas are commonly located in wetlands and coastal and marine environments.

6. Wildlife Development Areas

Wildlife Development Areas are established to improve, conserve, and sustainably manage habitats for wildlife species. These areas promote population recovery within natural habitats and contribute to the maintenance of healthy and functioning ecosystems.

7. Local and National Wetlands

Wetlands are of high ecological importance due to their ecosystem diversity and their critical role for waterbirds. In Türkiye, wetlands are protected at both national and local levels. These areas include wetlands outside the scope of the Ramsar Convention and are generally managed by local authorities or through specific conservation programs.

Local Wetlands: Wetlands protected and managed primarily by local administrations or regional conservation initiatives, contributing to the conservation of local biodiversity and the promotion of ecotourism.

National Wetlands: Wetlands designated for protection at the national level and largely overseen by state authorities, making significant contributions to Türkiye's overall biodiversity conservation efforts.

8. Ramsar Sites

Ramsar Sites are wetlands of international importance designated under the Ramsar Convention, particularly for their significance to waterbird populations. Türkiye became a Party to the Ramsar Convention in 1994 and, as of 2021, has 15 designated Ramsar Sites.

9. Biosphere Reserves

Biosphere Reserves designated by UNESCO are areas specifically designed to integrate biodiversity conservation with sustainable development objectives. Türkiye currently has three designated Biosphere Reserves.

Conservation and Management Approaches

The management of protected areas in Türkiye is primarily carried out by institutions such as the Ministry of Agriculture and Forestry and the General Directorate of Nature Conservation and National Parks. Wetlands and Wildlife Development Areas are of strategic importance for the sustainable provision of ecosystem services, the promotion of ecotourism, and the conservation of biodiversity. Conservation and management activities within these areas are implemented as a priority within the framework of local and national environmental policies, adopting an integrated and precautionary approach to the protection of natural values.

An assessment was conducted to evaluate the monitoring areas in relation to nationally designated protected areas. Distance information is provided in Table 1, and a visual representation is presented in Map 3.

Table 1 Flight Distance of Protected Areas to the Project Area

Protected Area	Distance (km)
Foça Special Environmental Protection Area	13.48
Karaburun-Ildır Special Environmental Protection Area	33.15
Spil Mountain National Park	44.7
Efeoğlu Nature Park	58.22
Çiçekli Nature Park	38.72
Karagöl Nature Park	31.35
Yamanlar Mountain Nature Park	27.88
Meryemana Nature Park	95.91
Gümüldür Nature Park	73.7
Ekmeksiz Nature Park	64.1
Tanay Nature Park	66.33
Ovacık Wildlife Development Area	76.30
Gebekirse Wildlife Development Area	89.18
Homa Fischpond Wildlife Development Area	14.93
Gediz Delta Ramsar Area	10.30
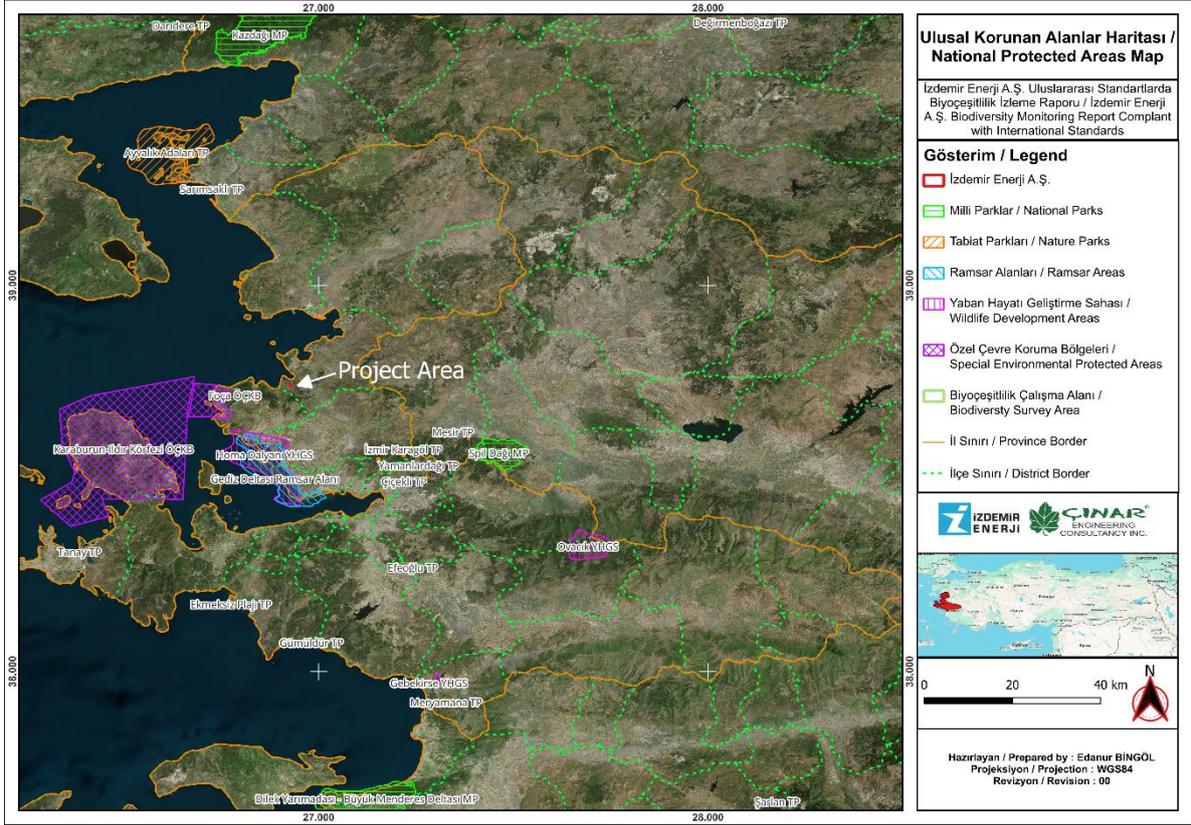
Map 3 Project Area and National Protected Areas Map

Based on this assessment, the İzdemir Enerji A.Ş. facilities are not located within any designated protected area, and no direct or indirect impacts on such areas are anticipated.

4.2. INTERNATIONAL PROTECTED AREAS

Internationally recognized protected areas are designated worldwide to conserve biodiversity, ensure the sustainable management of ecosystems, and safeguard natural heritage for future generations. These areas are generally established and governed under international conventions, agreements, and organizations. The main categories of internationally protected areas and their detailed descriptions are presented below.

1. **World Heritage Sites (UNESCO World Heritage Sites)**

Designated by the United Nations Educational, Scientific and Cultural Organization (UNESCO), these sites are of outstanding international importance for the conservation of natural and/or cultural heritage.

2. **Biosphere Reserves (UNESCO Biosphere Reserves)**

Biosphere Reserves are areas where human activities coexist with natural ecosystems, promoting biodiversity conservation alongside sustainable development objectives.

3. **Ramsar Sites**

Designated under the Ramsar Convention signed in 1971, Ramsar Sites are wetlands of international importance, particularly for waterbirds. These areas aim to ensure the sustainable management of water resources and the conservation of wetland biodiversity.

4. **Key Biodiversity Areas (KBAs)**

Key Biodiversity Areas are identified to safeguard specific ecosystem types, rare species, and critical habitats. In Türkiye, KBAs are areas that support endemic species and meet internationally recognized biodiversity conservation criteria. These areas commonly include wetlands, forests, coastal ecosystems, and steppe habitats.

5. **Important Plant Areas (IPAs)**

Due to its location at the intersection of several biogeographical regions, Türkiye hosts a rich and diverse flora. Important Plant Areas are designated to conserve threatened plant species and their habitats, with a particular focus on endemic and rare taxa.

6. **Important Bird Areas (IBAs)**

Important Bird Areas are sites of global significance for the conservation of bird species. Given Türkiye's strategic location along major migratory flyways, IBAs play a critical role in maintaining national and global avian biodiversity.

KBAs, IPAs, and IBAs in Türkiye constitute an essential component of the national protected area network and are aligned with international conservation standards. These areas are of strategic importance for supporting global biodiversity and contributing to international environmental agreements. The effective implementation of conservation measures within these areas is critical not only for biodiversity protection but also for the achievement of Türkiye's sustainable development objectives.

7. **Marine Protected Areas (MPAs)**

Marine Protected Areas are designated to conserve marine ecosystems and biodiversity. These areas aim to protect marine habitats, coral reefs, and marine mammals, contributing to the long-term sustainability of marine environments.

8. **IUCN Protected Areas**

Protected areas classified by the International Union for Conservation of Nature (IUCN) are evaluated under six management categories based on specific conservation objectives and governance approaches.

9. **Alliance for Zero Extinction (AZE) Sites**

The Alliance for Zero Extinction (AZE) is a global initiative established to protect the habitats of species that are facing imminent extinction. AZE Sites are identified as areas where one or more Critically Endangered or Endangered species are restricted to a single or very limited location, and where habitat protection is essential to prevent extinction. The primary objective of AZE is to achieve a vision of zero extinctions.

10. Natura 2000 Sites

The Natura 2000 network, established by the European Union to protect species and habitats, encompasses both terrestrial and marine areas. This network aims to ensure the long-term conservation of Europe's biodiversity through sustainable management practices.

11. Transboundary Protected Areas

Transboundary Protected Areas are sites that extend across the borders of two or more countries and are managed cooperatively. These areas promote integrated ecosystem management through international collaboration.

Internationally protected areas play a vital role not only in biodiversity conservation but also in the sustainable management of ecosystem services and the enhancement of environmental awareness. The conservation of these areas provides ecological, economic, and cultural benefits at local, national, and global scales. By hosting such areas, Türkiye makes a significant contribution to biodiversity conservation at both national and international levels.

An assessment of the monitoring areas in relation to internationally designated protected areas was conducted. Distance information is provided in Table 2, and a visual representation is presented in Map 4.

Table 2 Flight Distance from International Recognized Areas to the Project Area

Internationally Recognized Area	Distance (km)
Alaçatı Important Nature Area	51.25
Boz Mountain Important Nature Area	58.86
Çeşme Batı Burnu Important Nature Area	76.11
Çiçek Islands Important Nature Area	29.37
Doğanbey Coasts Important Nature Area	58.95
Foça Peninsula Important Nature Area	Within the area
Gediz Delta Important Nature Area	13.06
Karaburun and Ildır Important Nature Area	33.42
Küçük Menderes Delta Important Nature Area	88.54
Nif Mountain Important Nature Area	44.71
Spil Mountain Important Nature Area	39.11
Yamanlar Mountain Important Nature Area	20.64
Bakırçay Important Nature Area	19.20
Alaçatı-Zeytineli Coasts Important Nature Area	61.38
Nif Mountain Important Plant Area	43.87
Spil Mountain Important Plant Area	44.32
Boz Mountain Important Plant Area	92.72
Foça Islands Important Bird Area	17.11
Gediz Delta Important Bird Area	14.78
Küçük Menderes Important Bird Area	88.99
Ildır Islands Important Bird Area	56.05
Gediz Delta Ramsar Area	10.30
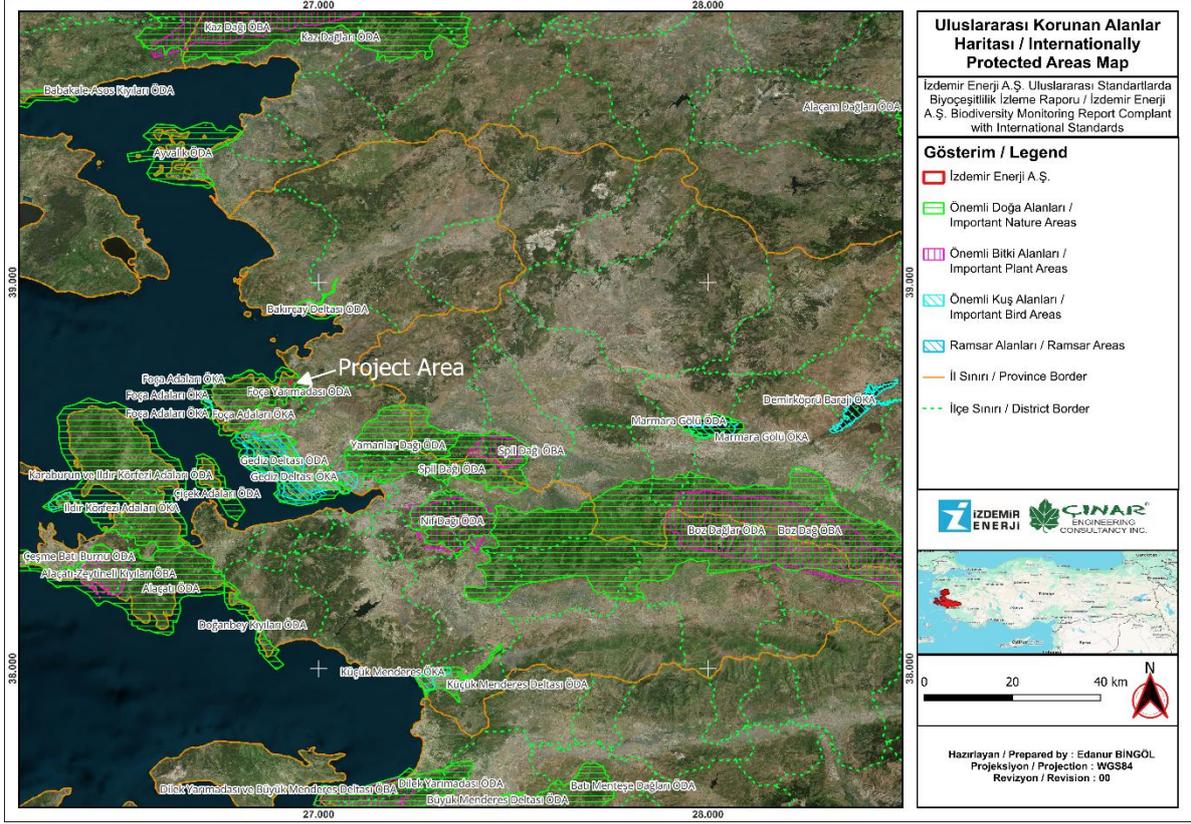
Map 4 Map of the Project Area and International Recognized Areas

Based on this assessment, the İzdemir Enerji A.Ş. facilities located within the administrative boundaries of Aliağa District, İzmir Province, are situated within the Foça Peninsula Key Biodiversity Area. Other internationally designated areas are located outside the defined zone of influence. However, given that the area is designated as an organized industrial zone, existing industrial activities are carried out within clearly defined and regulated boundaries, and associated environmental impacts are considered to be effectively controlled.

Taking into account the distance to sensitive areas outside the industrial zone, as well as the environmental management and control measures implemented at the facilities, no adverse impacts on these areas are anticipated. Other protected and internationally recognized areas are located outside the zone of influence, and therefore no direct or indirect impacts are expected.

5.OVERVİEW OF BİODİVERSİTY İN TÜRKİYE

Türkiye's biodiversity holds a significant position at the global scale and is shaped by the country's wide range of ecosystems. The number of species recorded in Türkiye and their conservation status are of critical importance for understanding ecosystem health and resilience.

Türkiye hosts more than 12,000 plant species, approximately 3,000 of which are endemic and found exclusively within the country. This high level of endemism is largely attributed to Türkiye's location at the intersection of Europe and Asia and its diverse biogeographical regions.

More than 130 mammal species have been recorded in Türkiye, including endemic and threatened species such as the Eurasian lynx, wild sheep, brown bear, and golden jackal.

Türkiye also supports approximately 500 bird species, reflecting its strategic position along major migratory flyways.

In addition, Türkiye is home to more than 100 reptile species and over 40 amphibian species, including endemic snake species and amphibians restricted to specific habitats.

Arthropods:

More than 40,000 arthropod species have been identified in Türkiye. This group, which includes butterflies, spiders, and insects, plays a crucial role in maintaining ecosystem balance and ecological processes.

Türkiye's freshwater ecosystems support over 300 fish species, including commercially important species such as carp, trout, and pike. However, several freshwater fish species are under threat due to habitat loss, water pollution, and hydrological alterations.

Marine ecosystems in Türkiye, spanning the Mediterranean Sea, the Aegean Sea, and the Black Sea, host more than 500 fish species. These include economically important species such as anchovy, sardine, sea bass, and gilthead seabream.

Two marine turtle species occur in Türkiye's seas: Caretta caretta (loggerhead sea turtle) and Chelonia mydas (green sea turtle). Türkiye is recognized as an important breeding and nesting area for both species.

More than ten marine mammal species have been recorded in Türkiye's marine waters, including dolphins and whales, which contribute significantly to marine biodiversity. Marine ecosystems are also critical for globally threatened species such as the Mediterranean monk seal (*Monachus monachus*).

Türkiye's marine environments contain ecologically important habitats such as seagrass meadows and coral-like reef structures, which are essential for maintaining healthy and productive marine ecosystems.

Species Conservation Status and Threats

The conservation status of species in Türkiye is assessed according to the IUCN Red List categories, including Critically Endangered (CR), Endangered (EN), and Vulnerable (VU).

Major threats affecting biodiversity in Türkiye include habitat loss and fragmentation, overexploitation, water pollution, climate change, and invasive alien species.

In conclusion, Türkiye's terrestrial, freshwater, and marine ecosystems host a rich and diverse array of species. However, the conservation of this biodiversity and the sustainable management of ecosystems require the implementation of effective, science-based conservation strategies. This is essential not only for the protection of biodiversity but also for the continuity of ecosystem services and human well-being.

5.1. Biodiversity Assessment of İzmir Province

İzmir Province exhibits a high level of biological diversity due to its location within the Aegean Region and its support of a wide range of ecosystem types. The province represents one of the rare areas where terrestrial, freshwater, and marine ecosystems coexist, thereby enhancing regional flora and fauna diversity. Within terrestrial ecosystems, dominant woody species include oak (Quercus spp.), black pine (*Pinus nigra*), sweetgum (Liquidambar orientalis), and olive (*Olea europaea*). These habitats provide important living and foraging areas for mammal species such as roe deer (*Capreolus capreolus*), wild boar (*Sus scrofa*), red fox (*Vulpes vulpes*), and various bat species. Among avian predators, species such as the common buzzard (*Buteo buteo*), eagles (Aquila spp.), and owls (Strigidae) are particularly notable.

From a freshwater ecosystem perspective, the Gediz and Büyük Menderes river systems constitute vital habitats for waterbirds, amphibians, and freshwater fish species. In marine ecosystems, seagrass meadows (*Posidonia oceanica*, *Zostera marina*), coral assemblages, and coastal habitats provide critical breeding and feeding grounds for marine mammals, including whales and dolphins, as well as for the threatened loggerhead sea turtle (*Caretta caretta*).

The flora of İzmir comprises approximately 3,000 plant species, a significant proportion of which are endemic and restricted to the region. Terrestrial vegetation includes forest ecosystems, maquis formations, and steppe habitats, while mountainous areas and wetlands further enhance ecological diversity through the presence of rare and localized species.

In terms of amphibian fauna, rivers, ponds, and wetlands within the province provide suitable breeding and feeding habitats for frog (Anura) and salamander (Caudata) species. Reptile fauna includes more than 40 species, comprising snakes (Serpentes), lizards (Lacertilia), and terrestrial and marine turtles. Lizards are commonly observed in terrestrial and rocky habitats, while snake species occur in both terrestrial and freshwater ecosystems.

İzmir is also of high significance with respect to avian diversity. Approximately 400 bird species have been recorded in the province, including migratory species, wetland-dependent birds, and raptors. The Gediz Delta and other wetland areas serve as key stopover, feeding, and breeding sites for species such as the greater flamingo (*Phoenicopterus roseus*), ducks (Anas spp.), and cormorants (Phalacrocorax spp.). Coastal zones additionally support breeding and wintering habitats for seabirds.

Seagrass meadows play a critical role in İzmir's marine biodiversity. Species such as *Posidonia oceanica* and *Zostera marina* provide essential ecosystem services, including carbon sequestration, oxygen production, improvement of water quality, prevention of coastal erosion, and stabilization of the seabed. These habitats offer shelter, feeding, and breeding areas for small fish, crustaceans, mollusks, and certain marine mammals.

The coastal areas of İzmir also constitute important habitats for the Critically Endangered Mediterranean monk seal (*Monachus monachus*). This species prefers isolated caves, rocky coastlines, and areas with limited human disturbance; however, it faces significant threats from coastal development, marine pollution, overfishing, and habitat loss.

In conclusion, İzmir's biodiversity is of strategic importance for the conservation of ecosystem integrity, the sustainability of ecosystem services, and the achievement of regional and international biodiversity objectives. The conservation of this rich biodiversity can be achieved through the sustainable management of natural resources, restoration of critical habitats, strengthening of protected areas, and the enhancement of environmental awareness at the societal level.

6. HABITAT ASSESSMENT

International habitat assessment is a process that examines the conservation status of habitats in different countries and the global management of ecosystems. These assessments are carried out by international organizations and environmental institutions, particularly the United Nations Environment Programme (UNEP) and the International Union for Conservation of Nature (IUCN). The studies are conducted through global environmental reports, biodiversity assessments, and ecosystem monitoring programs. Within this framework, critical ecosystems, threatened habitats, and internationally important protected areas are identified, and scientific data are provided to support the development of transboundary cooperation and global conservation policies. In addition, international habitat assessments facilitate information sharing and contribute to the establishment of joint conservation projects among countries.

National habitat assessment aims to determine the ecological status of natural areas within the boundaries of a specific country and to evaluate the conservation status of the species occurring in these areas. These assessments are generally conducted by ministries responsible for environment and nature conservation, scientific research institutions, and local authorities. The studies analyze ecosystem characteristics such as species diversity, habitat quality, threat factors, and conservation status. Parameters including population size and distribution of species, as well as ecosystem sustainability, are evaluated, and the results constitute a fundamental data source for shaping national nature conservation policies, developing conservation strategies, and supporting their implementation.

The identification of habitats involves a multidimensional process in which various methods and techniques are used. Field surveys and direct observations constitute the primary approach, and habitat classification is performed based on vegetation structure, fauna components, and ecological parameters. In addition, physical characteristics of habitats, such as soil type, moisture conditions, and vegetation density, are also included in the assessment.

Technological tools play a critical role in habitat identification and assessment studies. Geographic Information Systems (GIS), satellite imagery, and aerial photographs are widely used for habitat mapping and classification. These techniques provide efficient and rapid assessment opportunities, particularly over large areas, and enable the determination of the spatial distribution of different habitat types. Remote sensing methods are commonly applied in large-scale habitat classifications due to their time and cost efficiency. Moreover, these approaches allow the differentiation between natural habitats and areas affected by anthropogenic activities.

Habitat assessment studies are not limited to field observations and technological analyses but are also supported by scientific reports and comprehensive literature reviews. This integrated approach provides a robust scientific basis for the conservation, management, and sustainable use of habitats.

At the European scale, the CORINE and EUNIS habitat classification systems are widely used for habitat identification and monitoring. The CORINE system, developed by the European Environment Agency, provides a standardized framework supported by satellite data and field surveys and serves as an important reference for the development of nature conservation policies across Europe. The EUNIS system is a more comprehensive and detailed classification framework covering both terrestrial and aquatic ecosystems, allowing an in-depth assessment of the ecological characteristics and conservation status of habitats.

Within this context, biodiversity studies conducted for İzdemir Enerji A.Ş. within the administrative boundaries of Aliağa District, İzmir Province, were evaluated based on the EUNIS Habitat Classification System (see Map 2). The results of the habitat classification are presented in Map 5.
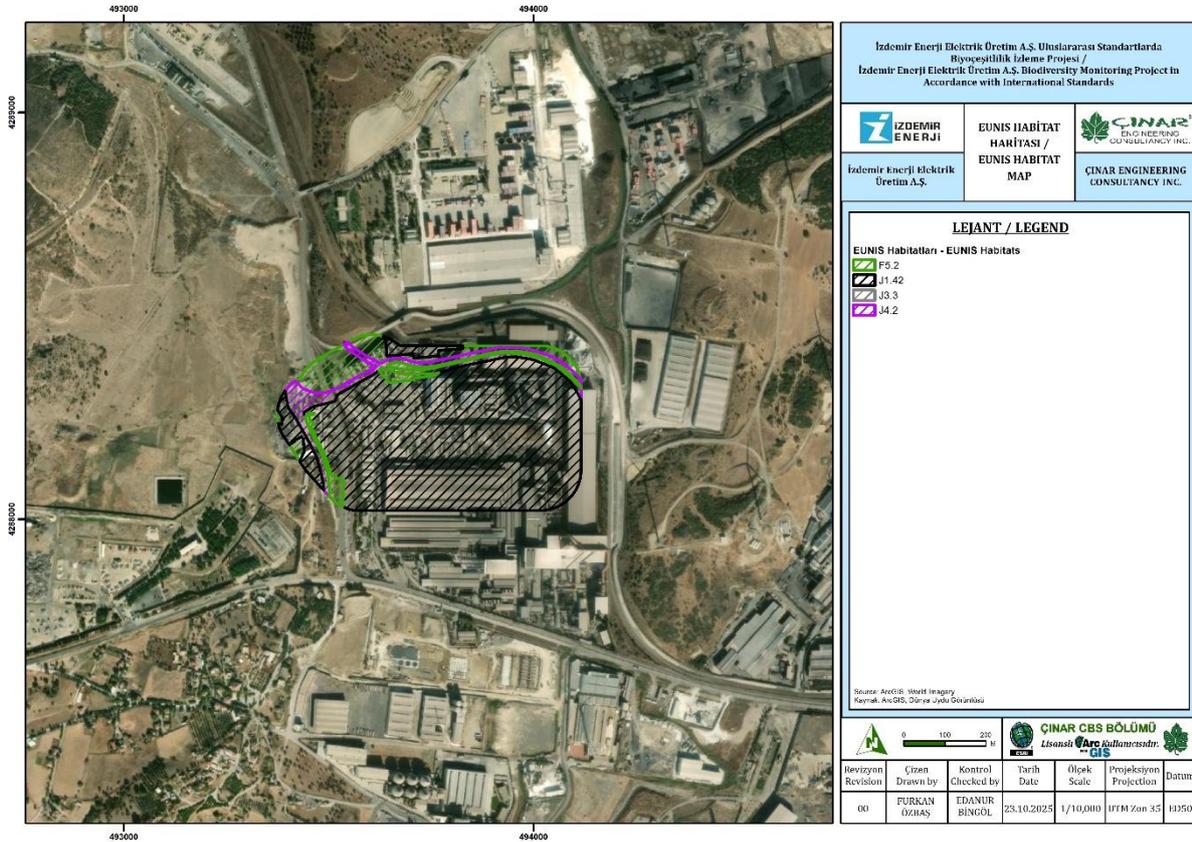
Map 5 EUNIS Habitat Types of the Project Areas

Habitat assessment is a critical step in understanding the ecological characteristics of an area, identifying key features that require conservation, and developing sustainable management plans. This process should be conducted in accordance with internationally recognized standards. In this context, the International Finance Corporation (IFC) Performance Standards provide a comprehensive framework for the conservation and sustainable management of habitats.

Assessment of Modified and Natural Habitats

Habitats may exhibit varying levels of degradation or conservation as a result of human activities and natural processes. This necessitates their classification into two main categories: modified (degraded) habitats and natural habitats. Such classification is of critical importance for the identification of appropriate conservation and management strategies.

Natural Habitats

Natural habitats are areas where human influence is limited or absent, and where species diversity and ecosystem functions are maintained in a natural balance. These habitats typically support high levels of biodiversity and provide significant ecosystem services.

Modified Habitats

Modified habitats are areas that have lost their structural and functional characteristics due to human activities. These habitats are generally degraded as a result of land-use change, industrial activities, agriculture, and urban development.

Management of Natural and Modified Habitats

The International Finance Corporation's Performance Standard 6 (IFC PS6) provides a critical framework for the management of natural and modified habitats. According to PS6:

Natural Habitats: These areas are considered to have high conservation priority. Any development activities should aim to avoid impacts where possible and minimize adverse effects on such habitats.

Modified Habitats: Restoration- and rehabilitation-oriented strategies should be developed. Nature-based solutions may be implemented to enhance biodiversity values within these areas.

In conclusion, habitat assessment is a critical tool for both the conservation of natural habitats and the sustainable management of degraded areas. Accordingly, the evaluation of habitat types within İzdemir Enerji A.Ş. is presented in Table 3. Based on this assessment, the areas where the main facilities are located fall within modified habitats.

Table 3 Evaluation of EUNIS Habitats

EUNIS Habitat Types	Assessment of Natural and Modified Habitats	AB Habitat Directives	İzdemir Enerji A.Ş
F5.2 – Maquis	Natural Habitat	-	+
J4.2 - Road networks	Modified Habitat	-	+
J1.42 - Urban and rural factories	Modified Habitat	-	+
J3.3 - Recently abandoned surface areas of mining and quarrying sites	Modified Habitat	-	+

7. NATİONAL AND INTERNATİONAL CONSERVATİON STATUS

The following conservation status categories have been used in the assessments presented within this report.

7.1. Endemic, Rare, or Threatened Plant and Animal Taxa

Based on field surveys, literature review, and questionnaire studies, lists of plant, amphibian, reptile, bird, and mammal species occurring within the project area and its surroundings, as well as those likely to occur due to habitat characteristics, have been compiled and evaluated in their respective sections of the report.

7.2. IUCN Threat Categories

The IUCN Red List Categories are a globally recognized system developed to classify species according to their risk of extinction. The IUCN Red List Categories and corresponding descriptions of species identified within the project area and its area of influence are summarized in Table 4 and illustrated in Figure 1.

Table 4 IUCN Red Data Book Categories

Category	Description
EX - Extinct	A taxon is classified as EX if there is no reasonable doubt that the last individual has died.
EW - Extinct in the Wild	A taxon is classified as EW if it no longer exists in its natural habitat but continues to survive in captivity or under artificial conditions.
CR - Critically Endangered	A taxon is classified as CR if it is at extremely high risk of extinction in the immediate future.
EN - Endangered	A taxon is classified as EN if it is at a high risk of extinction in the near future but is not yet classified as CR.
VU - Vulnerable	A taxon is classified as VU if it faces a high risk of extinction in the medium-term future, though it is not classified as CR or EN. Some species that are considered potentially at risk in the medium-term future, and known from multiple locations, are placed in this category. Additionally, species that are not currently at risk but may require protection in the future may also be included in this category.
NT - Near Threatened	A taxon that has not been classified as VU but is close to qualifying for the VU category.
LC - Least Concern	A taxon that is widespread, abundant, and not currently at risk of extinction, thus requiring no immediate conservation efforts.
DD - Data Deficient	A taxon is classified as DD if there is insufficient information about its distribution and abundance. Even if the biology of the taxon is well known, if there is inadequate data on its distribution or abundance, it is placed in this category. This classification indicates the need for further data collection. Once more information is gathered, the taxon should be reclassified into the appropriate category.
NE - Not Evaluated	A taxon that has not yet been assessed against any of the above criteria.
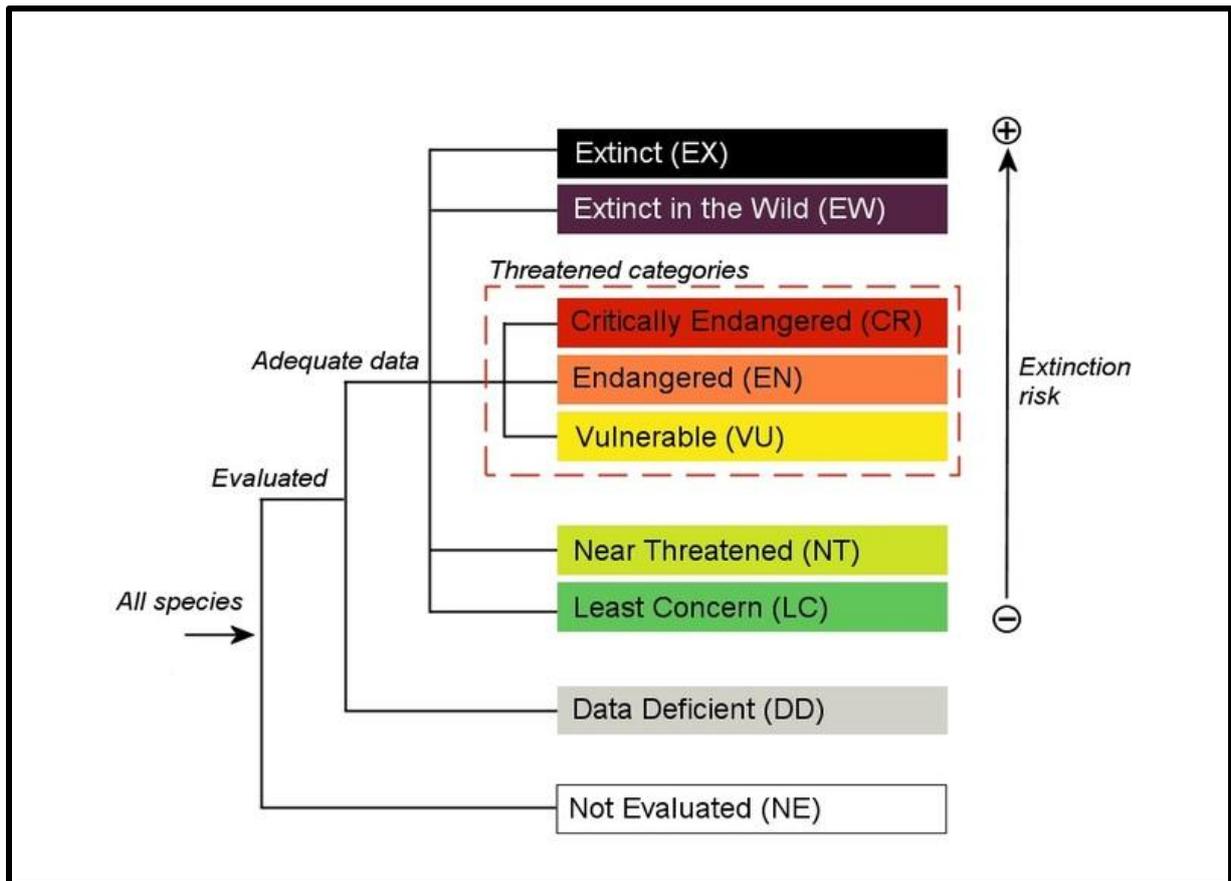
Figure 1 IUCN Risk Categories

Explanatory Information on Some Criteria:

The following additional criteria are accepted for categorizing species as CR, EN, or VU:

For **CR** (Critically Endangered) Category:

Plants that are at imminent risk of extinction in the wild within a very short period can be classified under this category based on the following criteria:

A) If the population is declining due to the following threats, and there is a 80% probability of population loss within 10 years:

a) Change in habitat characteristics and reduction in the degree of the species' habitat suitability.

b) Current and potential threats from collection.

c) The threat of invasion by another taxon, hybridization, disease, failure to produce seeds, pollution, impacts from competitors, and parasites.

B) If the plant's total distribution area is less than 100 km², or the species is known from only one location, with a distribution area of less than 10 km² and highly fragmented.

For **EN** (Endangered) Category:

A species may be classified as EN if it is under high risk of the threats mentioned above, and it is believed that: There will be a 50% reduction in population over the last 10 years or 3 generations. The distribution area is less than 5000 km² or restricted to a single area of 500 km². The population size is under 2500 individuals, or the species is known from at most 5 locations.

For **VU** (Vulnerable) Category: A species may be classified as VU if, in the face of the threats mentioned above: There is a projected 20% decline in population over the last 10 years or 3 generations. The distribution area is restricted to fewer than 10 locations or has a total area of 20,000 km². The number of mature individuals is less than 10,000 or it is believed that there could be a 10% decrease in population over 100 years based on field studies.

7.3. The Conventıon On The Conservatıon Of European Wıldlıfe And Natural Habıtats (Bern Conventıon)

The Bern Convention is an agreement aimed at conserving wild flora and fauna and their natural habitats. It ensures that necessary measures are taken to protect species that are endangered or at risk of becoming endangered, while also promoting the education and awareness of wild flora and fauna conservation. The Appendices of the Bern Convention, along with their explanations, are provided in Table 5.

Table 5 Appendices and Explanations of the Bern Convention

Appendix	Explanation
Appendix I	Flora species that are strictly protected.
Appendix II	Fauna species that are strictly protected (SPFS - Strictly Protected Fauna Species).
Appendix III	Protected fauna species (PFS - Protected Fauna Species).

7.4. Conventıon On Internatıonal Trade In Endangered Specıes Of Wıld Fauna And Flora (CITES)

CITES Convention is an international agreement that regulates the import and export, and essentially the international trade, of wild animal and plant species between the parties involved, through a system of permits and certificates. The CITES Convention aims to ensure that the international trade of endangered species does not threaten their survival in the wild. The Appendices and their explanations are provided in Table 6.

Table 6 CITES Convention Appendices and Explanations

Appendix	Explanation
Appendix I	Covers all species that are affected or potentially affected by trade and are at risk of extinction. To prevent further jeopardizing their survival, specimens of these species must be subject to particularly strict regulations, and trade should only be permitted under exceptional circumstances.
Appendix II	(a) Species that are not currently at absolute risk of extinction, but whose trade could lead to their extinction if not strictly regulated. These species must have their trade controlled to prevent exploitation incompatible with their continued survival. (b) This also includes other species that need to be regulated in order to ensure effective monitoring of trade for the species mentioned in (a).
Appendix III	Includes all species that are subject to regulation by any Party within its jurisdiction, with the intention to prevent or restrict their use. These species require cooperation with other Parties to ensure effective monitoring of trade.

7.5. Central Huntıng Commıssıon Decısıons (MAKK)

The Central Hunting Commission, within the framework of its authority derived from the Law No. 4915 on Land Hunting, meets annually to decide on various aspects of hunting regulations for the upcoming hunting season. This includes the identification of wildlife species to be protected, those permitted for hunting, and the rules governing their hunting periods, times, days, hunting quotas, prohibited hunting tools and methods, restricted hunting areas, and guidelines for hunting aimed at population control or pest management (www.milliparklar.gov.tr). The Decisions and Explanations of the Central Hunting Commission are summarized in Table 7.

Table 7 Central Hunting Commission Decisions and Explanations

Appendix	Explanation
Appendix 1	Hunting Species Protected by the Central Hunting Commission
Appendix 2	Hunting Species Permitted for Specific Periods by the Central Hunting Commission

7.6. Türkiye Bırds Red Data Book Categorıes (KIZIROĞLU, 2008)

The following categories have been defined by Prof. Dr. İlhami Kızıroğlu in the Türkiye Birds Red Data Book, which classifies bird species based on their conservation status. Each category reflects the level of endangerment or threat faced by the species and is accompanied by an explanation of the symbol used.

A1 – Extinct Species (Locally Extinct in the Wild)

A1.1: Species whose natural populations have been extinct for at least the last 15-25 years and are no longer observed in the wild. However, they may continue to exist in captivity, aviaries, or other artificial environments (domesticated species).

A1.2: Species whose population has drastically decreased across Türkiye. These species are represented by 1 to 20 individuals in the regions under monitoring. They are critically endangered, and immediate conservation efforts are needed for their survival in Türkiye.

A2 – Critically Endangered Species (High Extinction Risk)

Species that are critically endangered and observed in the regions under monitoring, with populations ranging between 22 to 50 individuals. If the current threats continue, these species are at an extremely high risk of extinction.

A3 – Endangered Species (Vulnerable to Extinction)

Species whose populations range from 52 to 500 individuals across Türkiye, with a high risk of extinction in the wild. These species are highly vulnerable and should be closely monitored and protected.

A3.1: Populations in the regions under monitoring have decreased, with numbers ranging between 52 to 100 individuals.

A4 – Vulnerable Species (Local Decline Expected)

Species whose populations in monitored regions range between 1002 and 10,000 individuals, with local declines observed. They are not yet under immediate extinction threat but are vulnerable and may face extinction if the current threats persist.

Species in this category show regional decline but are not yet facing an overall extinction threat.

A5 – Stable Species whose populations do not show any decline or extinction threat.

A6 – Insufficiently Studied Species for which there is insufficient data, and their populations have not been adequately monitored. These species are not well understood and require further research.

A7 – Unassessable Species for which an evaluation is not currently possible due to lack of reliable and complete data on their presence and populations in Türkiye.

B – Migratory or Wintering Birds:

B1.0 - Migratory species that were previously recorded in Türkiye during the winter season but are now considered extinct in the region. No examples are available for this category.

B1.1 - Species that use Türkiye as a wintering site or a transit area but are currently under significant threat of extinction due to a sharp population decline.

B1.2 - Species whose populations have severely declined in Türkiye, with only 1 to 20 individuals recorded in the regions under monitoring. These species are critically endangered and must be protected across Türkiye.

B2 - Species with populations ranging between 22 to 50 individuals in monitored regions. These species are facing serious threats and need immediate conservation efforts.

B3 - Species with populations generally ranging between 52 to 500 individuals in Türkiye, but whose natural habitats are under significant threat of extinction. These species are at a major risk of extinction in the wild.

B3.1 - Species whose populations have decreased, ranging between 502 to 1000 individuals in the regions under monitoring.

B4 - Species whose populations are not yet facing extinction but have shown regional declines that may lead to extinction if the trends continue.

B5 - Species that show no population decline and do not face immediate extinction threats.

B6 - Species that have been sufficiently researched but still lack enough recorded data for a reliable evaluation.

B7 - Species for which an evaluation cannot be made at present due to insufficient and unreliable data.

Summary of Symbols and Categories:

A1, A2, A3: Categories reflecting varying degrees of extinction risk based on population size, monitoring results, and geographic distribution.

A4, A5: Categories addressing species with regional decline and stable populations, respectively.

B1-B7: Categories reflecting the status of migratory birds, winter visitors, and species whose populations are monitored across various regions in Türkiye.

The classification system outlined above is a crucial tool for bird conservation in Türkiye, guiding efforts to protect threatened species and monitor their populations effectively.

7.7. EU Bırds And Habıtats Dırectıve

The EU Birds Directive (79/409/EEC or 2009/147/EC) is one of the cornerstones of the European Union's nature conservation policies. First adopted in 1979 and updated in 2009, this directive provides a legal framework aimed at the protection of wild bird species in Europe.

Main Objectives of the EU Birds Directive

1. *Protection of All Wild Bird Species*
   - Ensure the protection of all wild bird species found in their natural habitats across Europe.
   - Give priority to species that are endangered, rare, or have declining populations.
2. *Protection of Critical Habitats*
   - Safeguard habitats that are important for breeding, feeding, resting, and migration routes for birds.
   - Prevent habitat destruction and encourage sustainable management practices.
3. *Regulation of Hunting and Illegal Activities*
   - Control the hunting of birds, ensuring that it is carried out sustainably for specific species.
   - Prevent illegal hunting, trade, and collection of bird species.
4. *Protection of Migratory Birds*
   - Ensure the protection of migratory bird species across their migration routes and resting areas throughout Europe.
   - Strengthen international cooperation and coordination for migratory bird conservation.
5. *Support for Research and Monitoring*
   - Monitor population dynamics of bird species and promote scientific research.
   - Collect data to assess the effectiveness of conservation efforts.
6. *Raising Public Awareness and Participation*
   - Increase public awareness about the importance of bird conservation.
   - Encourage local communities and stakeholders to participate in conservation activities.

The Birds Directive also specifies, through its annexes, which species and habitats should be prioritized for protection. These provisions are summarized in Table 8, which outlines the annex lists and explanations.

Table 8 Annexes of the Birds Directive and Explanations

Annex	Explanation
Annex I	Species Whose Hunting is Prohibited: This annex lists the species for which hunting is prohibited within the geographical marine and terrestrial areas covered by the directive.
Annex II/A	Huntable Species in the Geographical Areas Covered by the Directive: This annex includes species that can be hunted within the marine and terrestrial areas of the countries bound by the directive.
Annex II/B	Huntable Species Within Specific National Borders: This annex identifies species that can be hunted, but only within certain national boundaries as defined by the directive.

The European Union Habitat Directive (92/43/EEC) is a key piece of legislation aimed at conserving biodiversity and ensuring the sustainable use of nature among member states. It was enacted in 1992 and focuses particularly on the protection of natural habitats and species of wild fauna and flora.

Key Objectives of the EU Habitat Directive:

- Conservation of Biodiversity Across Europe: The directive aims to protect Europe's biodiversity by ensuring the protection of various habitats and species.
- Achieving Good Conservation Status: Ensures that habitats and species are in a favorable conservation status across member states.
- Establishment of the Natura 2000 Network: This is a network of protected areas across Europe, designed to conserve Europe's most valuable habitats and species.
- Balancing Conservation Efforts with Social, Cultural, and Regional Needs: The directive emphasizes the need to consider socio-economic, cultural, and regional needs while implementing conservation efforts.

The Habitat Directive provides further details on which species and habitats are prioritized for conservation through the use of annexes. These explanations are presented in Table 9.

Table 9 Habitat Directive

Annex	Content
Annex I	Lists natural habitat types that require conservation.
Annex II	Includes species that need to be prioritized for conservation and for the establishment of protected areas.
Annex III	Defines criteria for the selection and evaluation of protected areas.
Annex IV	Contains a list of species that are strictly protected throughout Europe.
Annex V	Includes species that may be sustainably used, but require management plans for their use.
Annex VI	Lists prohibited methods of capture and killing.

8. FLORA

8.1. Scope and Objectives

Terrestrial flora field data were collected for the following purposes:

- ✓ To confirm the presence and distribution of terrestrial flora species; and
- ✓ To identify the presence of endemic, range-restricted, critically endangered, and endangered flora species.

8.2. Methodology

The EUNIS habitat type map (see Map 5) was used as a baseline for the flora field surveys. Flora sampling locations were selected to adequately represent each of the provisionally assigned EUNIS habitat types. The survey methodology applied is summarized below.

The following general approach was adopted:

- Plant species within the survey areas were recorded and, where necessary, collected for identification;
- Collected specimens were pressed and identified at the Ankara University Herbarium.

In cases where range-restricted, critically endangered, or endangered species were identified, the following data were recorded:

- Areal extent of the populations;
- Relative abundance based on the Braun–Blanquet cover scale (Sutherland, 2006);
- Ecological characteristics of the site (where possible, including soil and parent material type, slope, elevation, and aspect).

The floristic list is presented according to the phylogenetic order of the Flora of Turkey, with families under each group arranged following the same phylogenetic sequence and subsequently categorized alphabetically. For each species, information on taxonomic classification, phytogeographical region, endemism status, conservation category of endemic and rare species, and associated habitats is provided.

Plant species identified within the study area were determined using relevant reference sources (Brummitt, 2001; Donner, 1990; Eken et al., 2006; Ekim, 2007; Güner, 2012; Güner et al., 2012; Kaynak et al., 2007; Özhatay, 2006; Özhatay et al., 2003; Seçmen and Leblebici, 1997), with Flora of Turkey and the East Aegean Islands (Davis, 1965–1988) used as the primary reference.

The identification of endemic and threatened species was based on the Red Data Book of Turkish Plants (Ekim et al., 2000), including non-endemic species. As the Red Data Book of Turkish Plants was prepared according to IUCN (1994) criteria, conservation categories have been updated in line with IUCN (2001).

An overview of the field survey activities is presented below (see Photograph 1).

Photograph 1 View of Fieldworks

8.3. Selectıon Of Samplıng Locatıons

The EUNIS habitat type map (see Map 5) was used as a starting point for the field surveys. Sampling plots were designated by taking into account the size of natural habitats, as well as their continuous and fragmented characteristics.

8.4. Findings

Species classification, sampling station and habitat information, conservation and endemism status, and sensitivity levels are presented in tabular form.

For the determination of IUCN threat categories of endemic species and identified non-endemic range-restricted species, the primary reference used was the Red Data Book of Turkish Plants published by Ekim et al. (2000). These threat categories were subsequently re-evaluated in accordance with IUCN (2001) criteria, taking into account population status and threat factors affecting species within the region.

Accordingly, Table 10 presents the species recorded within the Project area, categorized by survey year.

Table 10 Plant Taxa Identified in the Facilities

2020							
Family	**Species**	**Common Name**	**Endemism**	**IUCN**	**CITES**	**BERN**	**İzdemir Enerji A.Ş**
Apocynaceae	*Nerium oleander*	Oleander	-	LC	-	-	+
Asteraceae	*Senecio vernalis*	Spring Groundsel	-	NE	-	-	+
Asteraceae	*Tragopogon latifolius*	Goatsbeard	-	NE	-	-	+
Pinaceae	*Pinus brutia*	Turkish Pine	-	LC	-	-	+
Salicaceae	*Salix alba*	White Willow	-	LC	-	-	+
Urticaceae	*Urtica urens*	Dwarf Nettle	-	NE	-	-	+
2021							
Family	**Species**	**Common Name**	**Endemism**	**IUCN**	**CITES**	**BERN**	**İzdemir Enerji A.Ş**
Apocynaceae	*Nerium oleander*	Oleander	-	LC	-	-	+
Asteraceae	*Senecio vernalis*	Spring Groundsel	-	NE	-	-	+
Asteraceae	*Tragopogon latifolius*	Goatsbeard	-	NE	-	-	+
Pinaceae	*Pinus brutia*	Turkish Pine	-	LC	-	-	+
Salicaceae	*Salix alba*	White Willow	-	LC	-	-	+
Urticaceae	*Urtica urens*	Dwarf Nettle	-	NE	-	-	+
2024							
Family	**Species**	**Common Name**	**Endemism**	**IUCN**	**CITES**	**BERN**	**İzdemir Enerji A.Ş**
Apocynaceae	*Nerium oleander*	Oleander	-	LC	-	-	+
Pinaceae	*Pinus brutia*	Turkish Pine	-	LC	-	-	+
Salicaceae	*Salix alba*	White Willow	-	LC	-	-	+
Asteraceae	*Senecio vernalis*	Spring Groundsel	-	NE	-	-	+
Cucurbitaceae	*Ecballium elaterium*	Squirting Cucumber	-	NE	-	-	+
Malvaceae	*Malva neglecta*	Common Mallow	-	LC	-	-	+
Moraceae	*Ficus carica*	Common Fig	-	LC	-	-	+
Malvaceae	*Malva sylvestris*	Musk Mallow	-	LC	-	-	+
Brassicaceae	*Capsella bursa-pastoris*	Shepherd's Purse	-	LC	-	-	+
Asteraceae	*Taraxacum aleppicum*	Aleppo Dandelion	-	NE	-	-	+
Anacardiaceae	*Schinus molle*	Pink Pepper Tree	-	LC	-	-	+
Solanaecae	*Lycium chinense*	Bougainvillea	-	NE	-	-	+
Asteraceae	*Chondrilla juncea*	Goji Berry	-	NE	-	-	+
Asteraceae	*Sonchus asper*	Rush Skeletonweed	-	NE	-	-	+
Vitaceae	*Vitis vinifera*	Spiny Sowthistle	-	NE	-	-	+
2025							
Family	**Species**	**Common Name**	**Endemism**	**IUCN**	**CITES**	**BERN**	**İzdemir Enerji A.Ş**
Apocynaceae	*Nerium oleander*	Oleander	-	LC	-	-	+
Pinaceae	*Pinus brutia*	Turkish Pine	-	LC	-	-	+
Salicaceae	*Salix alba*	White Willow	-	LC	-	-	+
Asteraceae	*Senecio vernalis*	Spring Groundsel	-	NE	-	-	+
Cucurbitaceae	*Ecballium elaterium*	Squirting Cucumber	-	NE	-	-	+
Malvaceae	*Malva neglecta*	Common Mallow	-	LC	-	-	+
Moraceae	*Ficus carica*	Common Fig	-	LC	-	-	+
Malvaceae	*Malva sylvestris*	Musk Mallow	-	LC	-	-	+
Brassicaceae	*Capsella bursa-pastoris*	Shepherd's Purse	-	LC	-	-	+
Asteraceae	*Taraxacum aleppicum*	Aleppo Dandelion	-	NE	-	-	+
Anacardiaceae	*Schinus molle*	Pink Pepper Tree	-	LC	-	-	+
Solanaecae	*Lycium chinense*	Bougainvillea	-	NE	-	-	+
Asteraceae	*Chondrilla juncea*	Goji Berry	-	NE	-	-	+
Asteraceae	*Sonchus asper*	Rush Skeletonweed	-	NE	-	-	+
Vitaceae	*Vitis vinifera*	Spiny Sowthistle	-	NE	-	-	+
Convolvulaceae	*Convolvulus arvensis*	Field Bindweed	-	NE	-	-	+

1.1. RESULTS

Within the scope of this Project, the entire Project area was surveyed. Field studies were conducted with due consideration of habitat sensitivity in order to characterize the ecological and floristic structure of the Project area. The results of these field surveys were used to define the overall floristic composition of the Project.

As a result of the studies carried out in 2025, a total of 16 plant species were recorded within İzdemir Enerji A.Ş. None of the identified species are endemic. Of these species, 8 are classified as "Least Concern (LC)" and 8 as "Not Evaluated (NE)" according to the IUCN Red List (see Figure 2).

None of the 16 recorded species are listed under the appendices of the CITES or Bern Conventions.
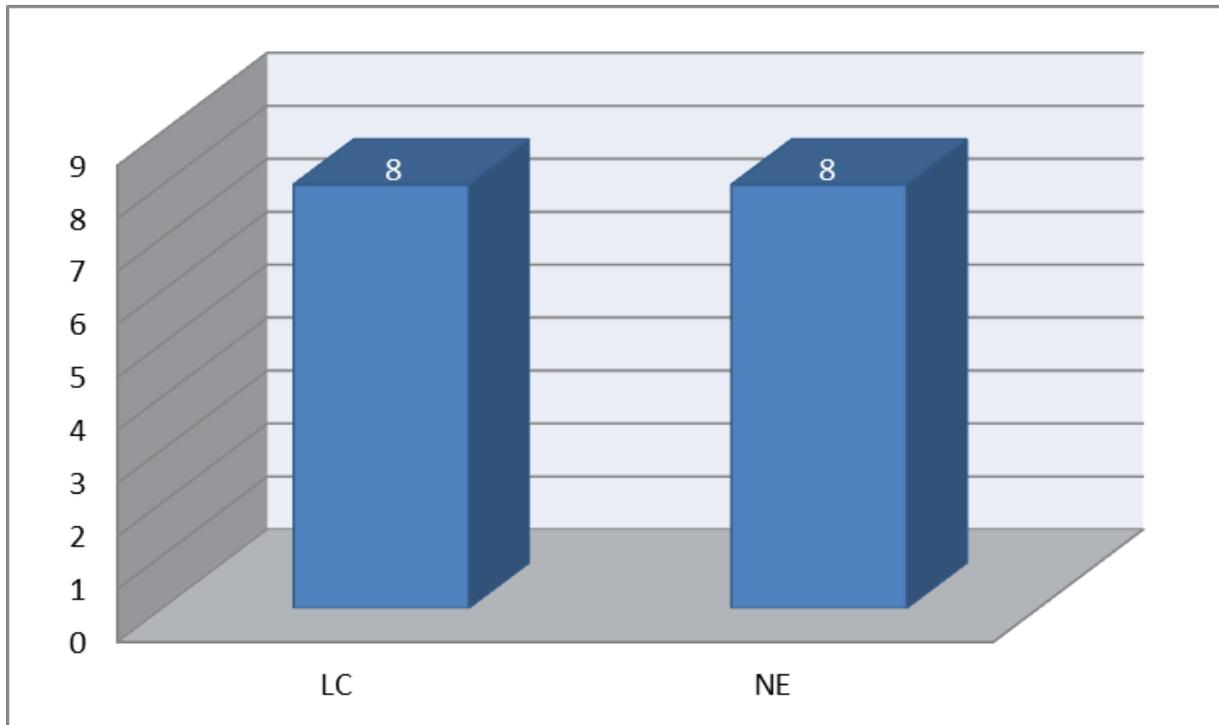

Figure 2 IUCN Categories of Plant Taxa Identified at İzdemir Enerji A.Ş.

9. FAUNA

Fauna species exhibit seasonal variability. As the preparation of a comprehensive fauna inventory for a given area may require one or more years, the fauna lists presented in this study are based on field surveys, direct observations, information obtained from local communities, biotope characteristics of the area, and known species distribution ranges. The fauna lists include both species observed during field surveys and species not directly observed but identified through literature review.

9.1. General Overview

9.1.1. Mammals

Mammals constitute one of the most well-known groups within the vertebrate class. All mammals are warm-blooded organisms. With the exception of monotremes, mammals reproduce by giving birth and feed their young with milk. The presence of hair or fur is another defining characteristic of mammals. Globally, mammals are represented by approximately 5,500 species (Wilson and Reeder, 1993, 2005; Nowak, 1999; IUCN, 2011).

Türkiye hosts a high level of biological diversity, encompassing three of the world's 34 recognized biodiversity hotspots—Iran–Anatolia, Mediterranean, and Caucasus (Mittermeier et al., 2004). A total of 168 mammal species are known to occur in Türkiye, of which 128 are small mammals (Osborn, 1964; Doğramacı, 1989; Demirsoy, 1996; Benda and Horacek, 1998; Yiğit et al., 2006; Krystufek and Vohralik, 2001, 2005, 2009). Six of these species are endemic to Anatolia, and several others have distribution ranges largely confined within Türkiye (Krystufek and Vohralik, 2005). Compared to European countries, Türkiye supports a higher number of mammal species.

Mammals in Türkiye are generally classified into nine taxonomic orders: Soricomorpha, Erinaceomorpha, Chiroptera, Lagomorpha, Rodentia, Carnivora, Artiodactyla, Perissodactyla, and Cetacea.

According to the IUCN, mammal species occurring in Türkiye include *Balaenoptera physalus* (EN) and *Monachus monachus* (CR); *Rhinolophus mehelyi*, *Myotis capaccinii*, *Spermophilus citellus*, *Mesocricetus auratus*, *Myomimus roachi*, *Vormela peregusna*, *Ursus arctos*, *Physeter catadon*, *Capra aegagrus*, *Gazella subgutturosa*, and *Gazella gazella (VU)*; and *Rhinolophus euryale*, *Myotis bechsteinii*, *Nyctalus lasiopterus*, *Barbastella barbastellus*, *Miniopterus schreibersii*, *Oryctolagus cuniculus*, *Spermophilus xanthoprymnus*, *Mesocricetus brandti, Prometheomys schaposchnikowi, Allactaga euphratica, Lutra lutra, Hyaena hyaena, Ovis aries gmelini, Ovis aries anatolica,* and *Meriones* spp. (NT) (IUCN, 2017).

9.1.2. Birds

Türkiye is of significant ornithological importance due to its geographical location, large surface area, complex topography, and climatic diversity. Situated at the intersection of Asia, Europe, and Africa, Türkiye forms a natural bridge linking the Western Palearctic region with southern wintering grounds. The country lies along major Palearctic migration routes, and its diverse geography and climate provide suitable habitats for numerous bird species (Beaman, 1997; Erdoğan, 1998; Kiziroğlu, 1989; Roselaar, 1995). Bird migration through the straits and the Çoruh Valley, as well as high bird concentrations in certain wetlands, further highlight Türkiye's ornithological significance (Anonim, 2004).

Globally, approximately 9,600 bird species belonging to 27 orders and 154 families have been recorded. Around 500 species, representing 23 orders, have been identified in Europe, and a substantial proportion of these occur in Türkiye (Aslan and Kiziroğlu, 2003; Beaman, 1997; Bilgin and Akçakaya, 1987; Erdoğan, 1998; Heinzel and Parslow, 1995; Roselaar, 1995; Kirwan et al., 1998; Kiziroğlu, 1989; TRAKUS). Among these, 13 species have uncertain status, approximately 300 species breed regularly, around 70 species are wintering or passage migrants, and 40–45 species are irregular visitors, occasionally recorded under adverse weather conditions (Anonim, 2004).

Bird distribution in Türkiye varies significantly by season and year. Bird populations peak during autumn migration (September–November), particularly along coastal areas, while a similar but less intensive migration occurs in spring (February–April). Spring migration occurs over a longer period and across a wider area with fewer individuals, whereas autumn migration is more concentrated and occurs over a shorter time frame (Anonim, 2004).

9.1.3. Reptiles

Türkiye's location at the intersection of three biogeographical regions—Euro-Siberian, Iran–Turan, and Mediterranean—combined with its diverse topography, climatic variability, and position as a faunal migration corridor, has resulted in exceptionally high biodiversity. Additionally, Türkiye was relatively unaffected by the four major glaciation periods between one million and twelve thousand years ago, serving as a refugium for many species, which contributed to increased biodiversity while many species became extinct in Europe.

Türkiye hosts approximately 129 reptile species, comparable to the diversity found across continental Europe (Baran and Atatür, 1998; Sindaco et al., 2000). Reptiles are a vertebrate class positioned between amphibians and birds and are fully adapted to terrestrial life. This class includes turtles, lizards, and snakes. Their skin is dry, largely lacking glands, and covered with a keratinized layer forming scales or plates that are periodically shed and renewed.

Türkiye supports 11 turtle species inhabiting terrestrial, marine, and freshwater environments, 63 lizard species (8 endemic), and 55 snake species, of which only 15 are venomous, belonging to the families Viperidae and Elapidae. A total of 11 snake species are endemic to Türkiye. Reptiles are widely distributed throughout the country, forming dense populations in suitable habitats.

9.1.4. Amphibians

Due to its geographical position, Türkiye functions as both a bridge and a barrier between Asia and Europe. Its location at the intersection of the Iran–Turan, Euro-Siberian, and Mediterranean biogeographical regions, combined with diverse climatic and topographical features, has resulted in high amphibian diversity comparable to that of Europe.

A total of 28 amphibian species occur in Türkiye. Of these, 14 species belong to the order Urodela, including 7 endemic species (*Lyciasalamandra fazilae*, *L. antalyana*, *L. billae, L. atifi, L. flavimembris, L. luschani, Neurergus strauchi*). These tailed amphibians require water or moist environments for breeding and are primarily nocturnal.

The order Anura is represented by 14 tailless amphibian species, including 3 endemic species (*Rana holtzi, Rana tavasensis, Pelophylax caralitanus*). While some species are fully aquatic and others terrestrial, all require water for reproduction. Tailless amphibians are widely distributed across Türkiye.

9.2. Scope and Objectives

Terrestrial fauna field data were collected in order to:

- Confirm the presence and distribution of terrestrial fauna species within natural habitat areas;
- Identify the presence of endemic, range-restricted, critically endangered, endangered, migratory, and congregatory fauna species;
- Determine the presence and boundaries of habitats requiring conservation at the national or global level.

9.3. Methodology

Methods were applied to confirm fauna presence and to assess habitat suitability for supporting fauna populations. Mammals, birds, reptiles, and amphibians were considered priority taxa.

9.3.1. Mammals

Small terrestrial mammals are often abundant but rarely observed directly, their signs are infrequently detected, and species-level identification is challenging. However, they can be effectively sampled using sufficient numbers of traps or pitfall systems (e.g. standard Sherman live traps).

Species associated with specific habitat types were identified through the installation of an adequate number of live traps representative of each habitat type. For medium- and large-sized mammals, the following observational methods were employed:

- Direct observations;
- Detection of feces, tracks, and other signs.

Transect surveys were conducted with a minimum walking duration of 30 minutes, during which all mammal signs (burrows, feces, feeding remains, direct sightings, etc.) were recorded. Information obtained from local communities, particularly hunters and forestry personnel, was also incorporated into the assessment.

9.3.2. Birds

Within the scope of the Project, point count and transect count methods were applied (Bibby et al., 1998). Each point was surveyed for approximately 30 minutes, with observations conducted simultaneously by two observers along transects. All bird species seen or heard were recorded.

In addition to direct observations, bird presence was determined through habitat characteristics (e.g. mudflats, rocky areas), signs such as nests, chicks, feathers, footprints, pellets, droppings, identifiable bone fragments, and feeding traces. Literature data from previous studies and interviews with local residents supported species identification, and photographs were taken where possible.

9.3.3. Reptiles

Reptile species were surveyed within specific microhabitats (e.g. under stones, shrublands). Each sampling effort lasted approximately 30 minutes, and identified species were recorded and photographed where possible.

9.3.4. Amphibians

Amphibian surveys were conducted in specific microhabitats (e.g. shrublands, underground areas). Each sampling effort lasted approximately 30 minutes, with identified species recorded and photographed where possible.

9.4. Selection of Sampling Locations

The EUNIS (European Nature Information System) habitat type map was used as the baseline for terrestrial field surveys. Sampling areas were selected by considering the size, continuity, and fragmented nature of natural habitats.

9.5. Findings

The distribution and detailed information on fauna components are presented below. Species classifications, threat factors (if any), conservation and endemism status, and sensitivity levels are provided in tabular form. As the entire area is located within an Industrial Zone and is surrounded by fencing, no mammal evidence was recorded within the facilities. Literature-based assessments were therefore included only for rodent and bat species potentially occurring in the area.

9.5.1. Mammals

As İzdemir Enerji A.Ş. and its surroundings are subject to intensive anthropogenic impacts, no mammal species were recorded during the field surveys. Information on mammal species potentially occurring in the area is presented in Table 11.

9.5.2. Birds

Bird species recorded within İzdemir Enerji A.Ş. and its surroundings are presented in Table 12.

9.5.3. Reptiles

Reptile species recorded within İzdemir Enerji A.Ş. and its surroundings are presented in Table 13.

9.5.4. Amphibians

Amphibian species recorded within İzdemir Enerji A.Ş. and its surroundings are presented in Table 14.

Table 11 Mammal Taxa Identified in the Facilities

2020								
Family	**Species**	**Common Name**	**Endemism**	**IUCN**	**CITES**	**BERN**	**MAKK**	**İzdemir Enerji A.Ş.**
Rhinolophidae	*Rhinolophus ferrumequinum*	Greater Horseshoe Bat	-	LC	-	II	-	+
Rhinolophidae	*Rhinolophus hipposideros*	Lesser Horseshoe Bat	-	LC	-	II	-	+
Rhinolophidae	*Rhinolophus blasii*	Blasius' Horseshoe Bat	-	LC	-	II	-	+
Vespertilionidae	*Pipistrellus pipistrellus*	Common Pipistrelle	-	LC	-	III	-	+
Muridae	*Rattus norvegicus*	Brown Rat	-	LC	-	-	-	+
Muridae	*Rattus rattus*	Black Rat	-	LC	-	-	-	+
Muridae	*Mus macedonicus*	Macedonian Mouse	-	LC	-	-	-	+
2021								
Family	**Species**	**Common Name**	**Endemism**	**IUCN**	**CITES**	**BERN**	**MAKK**	**İzdemir Enerji A.Ş.**
Rhinolophidae	*Rhinolophus ferrumequinum*	Greater Horseshoe Bat	-	LC	-	II	-	+
Rhinolophidae	*Rhinolophus hipposideros*	Lesser Horseshoe Bat	-	LC	-	II	-	+
Rhinolophidae	*Rhinolophus blasii*	Blasius' Horseshoe Bat	-	LC	-	II	-	+
Vespertilionidae	*Pipistrellus pipistrellus*	Common Pipistrelle	-	LC	-	III	-	+
Muridae	*Rattus norvegicus*	Brown Rat	-	LC	-	-	-	+
Muridae	*Rattus rattus*	Black Rat	-	LC	-	-	-	+
Muridae	*Mus macedonicus*	Macedonian Mouse	-	LC	-	-	-	+
2024								
Family	**Species**	**Common Name**	**Endemism**	**IUCN**	**CITES**	**BERN**	**MAKK**	**İzdemir Enerji A.Ş.**
Rhinolophidae	*Rhinolophus ferrumequinum*	Greater Horseshoe Bat	-	LC	-	II	-	+
Rhinolophidae	*Rhinolophus hipposideros*	Lesser Horseshoe Bat	-	LC	-	II	-	+
Rhinolophidae	*Rhinolophus blasii*	Blasius' Horseshoe Bat	-	LC	-	II	-	+
Vespertilionidae	*Pipistrellus pipistrellus*	Common Pipistrelle	-	LC	-	III	-	+
Muridae	*Rattus norvegicus*	Brown Rat	-	LC	-	-	-	+
Muridae	*Rattus rattus*	Black Rat	-	LC	-	-	-	+
Muridae	*Mus macedonicus*	Macedonian Mouse	-	LC	-	-	-	+
2025								
Family	**Species**	**Common Name**	**Endemism**	**IUCN**	**CITES**	**BERN**	**MAKK**	**İzdemir Enerji A.Ş.**
Rhinolophidae	*Rhinolophus ferrumequinum*	Greater Horseshoe Bat	-	LC	-	II	-	+
Rhinolophidae	*Rhinolophus hipposideros*	Lesser Horseshoe Bat	-	LC	-	II	-	+
Rhinolophidae	*Rhinolophus blasii*	Blasius' Horseshoe Bat	-	LC	-	II	-	+
Vespertilionidae	*Pipistrellus pipistrellus*	Common Pipistrelle	-	LC	-	III	-	+
Muridae	*Rattus norvegicus*	Brown Rat	-	LC	-	-	-	+
Muridae	*Rattus rattus*	Black Rat	-	LC	-	-	-	+
Muridae	*Mus macedonicus*	Macedonian Mouse	-	LC	-	-	-	+

Table 12 Bird Taxa Identified in the Facilities

Family	Species	Common Name	Endemism	IUCN	CITES	BERN	MAKK	RDB	Status	İzdemir Enerji A.Ş
2020										
Columbidae	*Columba livia*	Rock Dove	-	LC	-	III	II	A.5	Y	+
Columbidae	*Spilopelia senegalensis*	Laughing Dove	-	LC	-	III	I	A.4	Y	+
Columbidae	*Streptopelia decaocto*	Eurasian Collared Dove	-	LC	-	III	I	A.5	Y	+
Corvidae	*Corvus cornix*	Hooded Crow	-	NE	-	III	-	A.5	Y	+
Corvidae	*Pica pica*	Eurasian Magpie	-	LC	-	-	II	A.5	Y	+
Hirundinidae	*Delichon urbicum*	House Martin	-	LC	-	II	-	A.3	YZ	+
Passeridae	*Passer domesticus*	House Sparrow	-	LC	-	-	II	A.5	Y	+
2021										
Columbidae	*Columba livia*	Rock Dove	-	LC	-	III	II	A.5	Y	+
Columbidae	*Spilopelia senegalensis*	Laughing Dove	-	LC	-	III	I	A.4	Y	+
Columbidae	*Streptopelia decaocto*	Eurasian Collared Dove	-	LC	-	III	I	A.5	Y	+
Corvidae	*Corvus cornix*	Hooded Crow	-	NE	-	III	-	A.5	Y	+
Corvidae	*Pica pica*	Eurasian Magpie	-	LC	-	-	II	A.5	Y	+
Hirundinidae	*Delichon urbicum*	House Martin	-	LC	-	II	-	A.3	YZ	+
Passeridae	*Passer domesticus*	House Sparrow	-	LC	-	-	II	A.5	Y	+
2024										
Columbidae	*Columba livia*	Rock Dove	-	LC	-	III	II	A.5	Local	+
Columbidae	*Streptopelia decaocto*	Eurasian Collared Dove	-	LC	-	III	I	A.5	Local	+
Corvidae	*Pica pica*	Eurasian Magpie	-	LC	-	-	II	A.5	Local	+
Passeridae	*Passer domesticus*	House Sparrow	-	LC	-	-	II	A.5	Local	+
2025										
Columbidae	*Columba livia*	Rock Dove	-	LC	-	III	II	A.5	Local	+
Columbidae	*Streptopelia decaocto*	Eurasian Collared Dove	-	LC	-	III	I	A.5	Local	+
Corvidae	*Pica pica*	Eurasian Magpie	-	LC	-	-	II	A.5	Local	+
Passeridae	*Passer domesticus*	House Sparrow	-	LC	-	-	II	A.5	Local	+
Corvidae	*Corvus cornix*	Hooded Crow	-	NE	-	III	-	A.5	Local	+
Columbidae	*Spilopelia senegalensis*	Laughing Dove	-	LC	-	III	I	A.4	Local	+

Table 13 Reptile Taxa Identified in the Facilities

2020							
Family	Species	Common Name	Endemism	IUCN	CITES	BERN	İzdemir Enerji A.Ş
Agamidae	*Stellagama stellio*	Starred Agama	-	LC	-	II	-
Gekkonidae	*Hemidactylus turcicus*	Turkish Gecko	-	LC	-	III	-
Lacertidae	*Lacerta trilineata*	Three-lined Skink	-	LC	-	II	-
Testudinidae	*Testudo graeca*	Greek Tortoise	-	VU	II	II	-
2021							
Family	Species	Common Name	Endemism	IUCN	CITES	BERN	İzdemir Enerji A.Ş
Agamidae	*Stellagama stellio*	Starred Agama	-	LC	-	II	-
Gekkonidae	*Hemidactylus turcicus*	Turkish Gecko	-	LC	-	III	-
Lacertidae	*Lacerta trilineata*	Three-lined Skink	-	LC	-	II	-
Testudinidae	*Testudo graeca*	Greek Tortoise	-	VU	II	II	-
2024							
Family	Species	Common Name	Endemism	IUCN	CITES	BERN	İzdemir Enerji A.Ş
Agamidae	*Stellagama stellio*	Starred Agama	-	LC	-	II	+
Gekkonidae	*Hemidactylus turcicus*	Turkish Gecko	-	LC	-	III	+
Lacertidae	*Lacerta trilineata*	Three-lined Skink	-	LC	-	II	-
Testudinidae	*Testudo graeca*	Greek Tortoise	-	VU	II	II	-
2025							
Family	Species	Common Name	Endemism	IUCN	CITES	BERN	İzdemir Enerji A.Ş
Agamidae	*Stellagama stellio*	Starred Agama	-	LC	-	II	+
Gekkonidae	*Hemidactylus turcicus*	Turkish Gecko	-	LC	-	III	-
Lacertidae	*Lacerta trilineata*	Three-lined Skink	-	LC	-	II	+
Testudinidae	*Testudo graeca*	Greek Tortoise	-	VU	II	II	-

Table 14 Amphibian Taxa Identified in the Facilities

Family	Species	Common Name	Endemism	IUCN	CITES	BERN	İzdemir Enerji A.Ş
2020							
Family	**Species**	**Common Name**	**Endemism**	**IUCN**	**CITES**	**BERN**	**İzdemir Enerji A.Ş**
Bufonidae	*Bufo bufo*	Common Toad	-	LC	-	III	+
Bufonidae	*Bufotes variabilis*	Eastern Spadefoot Toad	-	DD	-	III	-
Ranidae	*Pelophylax ridibundus*	Green Frog	-	LC	-	III	-
2021							
Family	**Species**	**Common Name**	**Endemism**	**IUCN**	**CITES**	**BERN**	**İzdemir Enerji A.Ş**
Bufonidae	*Bufo bufo*	Common Toad	-	LC	-	III	-
Bufonidae	*Bufotes variabilis*	Eastern Spadefoot Toad	-	DD	-	III	-
Ranidae	*Pelophylax ridibundus*	Green Frog	-	LC	-	III	-
2024							
Family	**Species**	**Common Name**	**Endemism**	**IUCN**	**CITES**	**BERN**	**İzdemir Enerji A.Ş**
Bufonidae	*Bufo bufo*	Common Toad	-	LC	-	III	-
Bufonidae	*Bufotes variabilis*	Eastern Spadefoot Toad	-	DD	-	III	-
Ranidae	*Pelophylax ridibundus*	Green Frog	-	LC	-	III	-
2025							
Family	**Species**	**Common Name**	**Endemism**	**IUCN**	**CITES**	**BERN**	**İzdemir Enerji A.Ş**
Bufonidae	*Bufo bufo*	Common Toad	-	LC	-	III	+
Bufonidae	*Bufotes variabilis*	Eastern Spadefoot Toad	-	DD	-	III	-
Ranidae	*Pelophylax ridibundus*	Green Frog	-	LC	-	III	-

9.6. Conclusions

9.6.1. Mammals

No mammal species were recorded during the field surveys due to the high level of anthropogenic disturbance within the Project area. Based on literature data, it was determined that seven mammal species may potentially occur in the area, comprising four bat species and three rodent species.

No endemic species were identified among these taxa. According to the IUCN Red List, all species fall within the "Least Concern (LC)" category (see Figure 3). Three species are listed under Appendix II of the Bern Convention, and one species is listed under Appendix III. None of the species are included in the appendices of CITES.
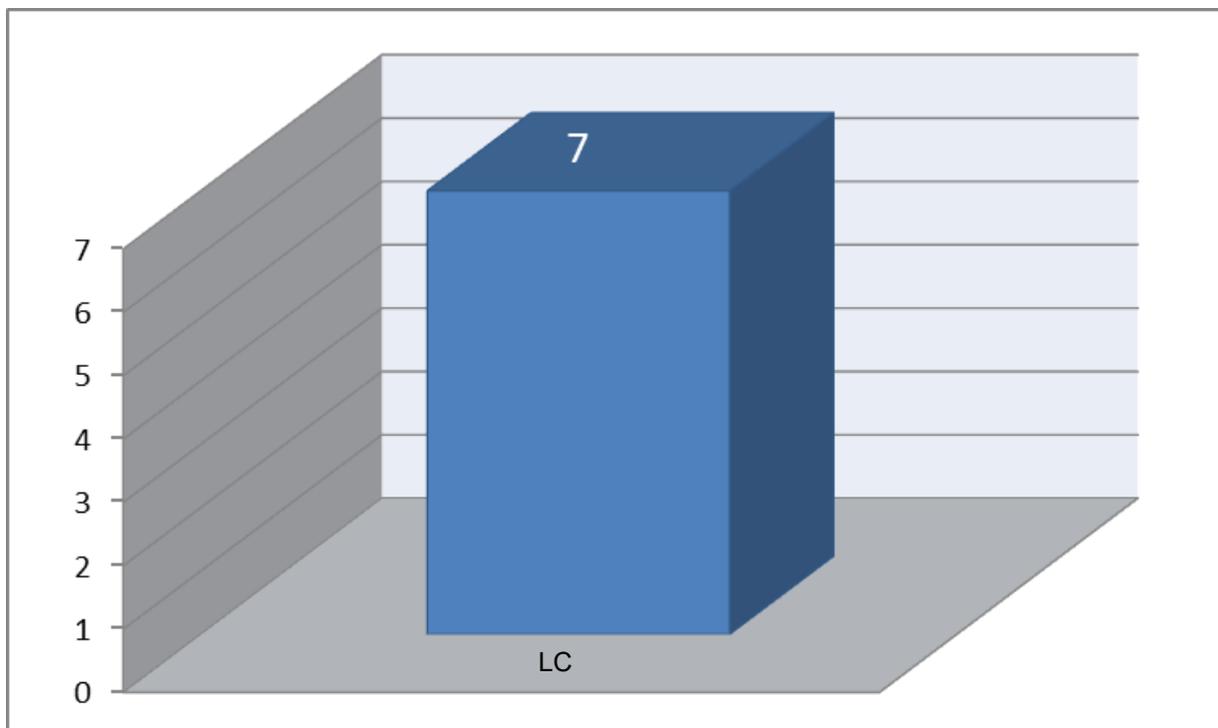

Figure 3 IUCN Assessment of Mammals

9.6.2. Birds

Due to the high level of anthropogenic disturbance, bird diversity within the Project area was found to be low during the surveys. Based on field observations and literature data, it was determined that six bird species may occur in the area. According to the IUCN Red List, five species are classified as "Least Concern (LC)" and one species as "Not Evaluated (NE)" (see Figure 4). Four species are listed under Appendix III of the Bern Convention.

Photographs of the species recorded during the surveys are presented below.
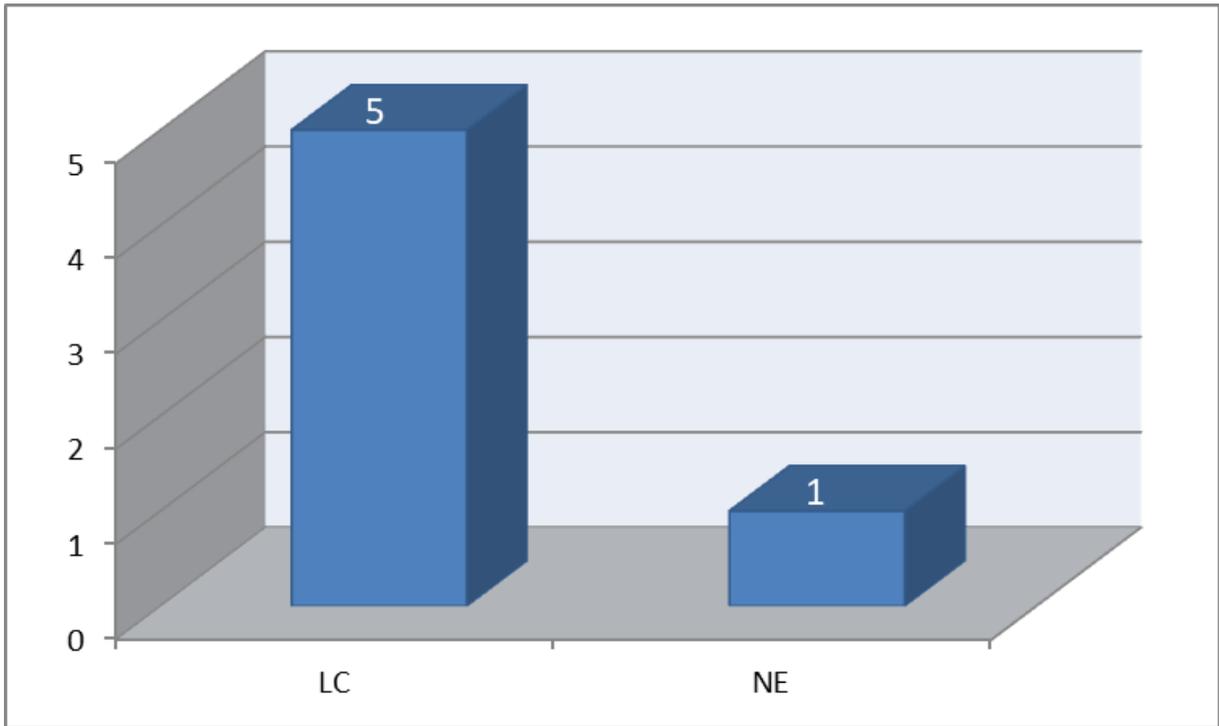
Figure 4 IUCN Assessment of Birds

Photograph 2 Passer domesticus (IUCN: LC)

9.6.3. Reptiles

No reptile species were recorded during the field surveys due to the intensive anthropogenic disturbance within the Project area. Based on literature data, four reptile species are considered likely to occur in the area. According to the IUCN Red List, three species are classified as "Least Concern (LC)" and one species as "Vulnerable (VU)" (see Figure 5). Three species are listed under Appendix II of the Bern Convention, and one species under Appendix III. Among these species, Testudo graeca (spur-thighed tortoise) is included in Appendix II of CITES. Testudo graeca is classified as Vulnerable (VU) on the IUCN Red List, primarily due to the rapid degradation and loss of its habitats as a result of human-induced activities such as agriculture, urbanization, and infrastructure development. In addition, illegal collection and trade for the pet market pose significant threats to the species' populations. The species' low reproductive rate and long life cycle further increase its vulnerability to these pressures.

Its inclusion in CITES Appendix II ensures that international trade in the species is strictly regulated and permitted only when it is demonstrated to be sustainable. These conservation measures aim to contribute to the protection of natural populations and the long-term survival of the species.
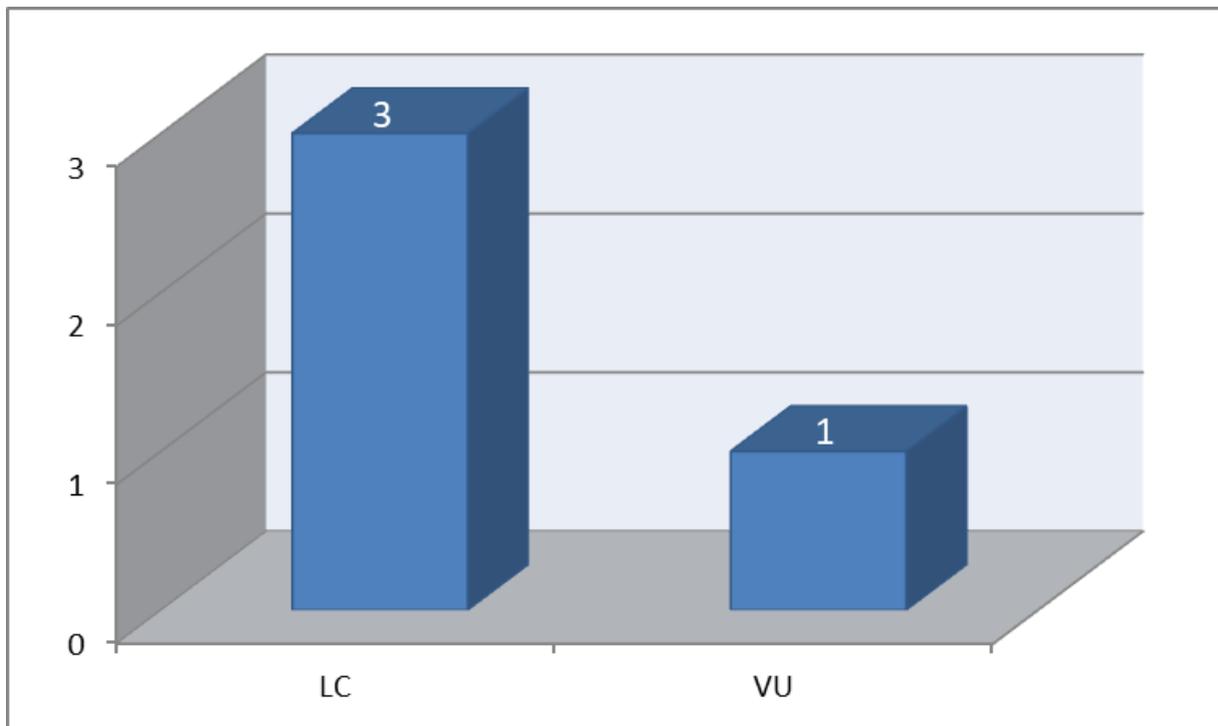

Figure 5 IUCN Assessment of Repitles

9.6.4. Amphibians

No amphibian species were recorded during the field surveys due to the channelization of the stream and the high level of anthropogenic disturbance within the Project area. Based on literature data, three amphibian species are considered likely to occur in the area. According to the IUCN Red List, two species are classified as "Least Concern (LC)" and one species as "Data Deficient (DD)" (see Figure 6).

All three species are listed under Appendix III of the Bern Convention. None of the species are included in the appendices of CITES.
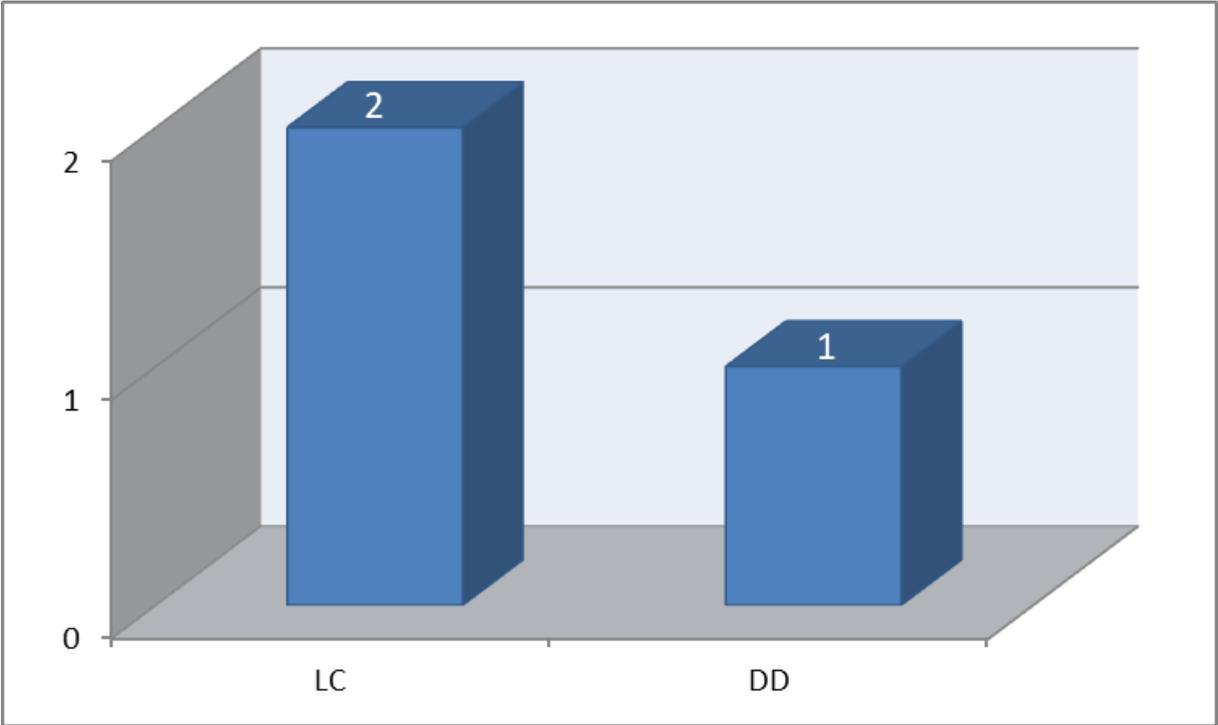
Figure 6 IUCN Assessment of Amphibians

10. FRESHWATER AND MARINE HABITATS

During the monitoring studies conducted in 2020 and 2021 within the İzdemir Enerji Factory area, a stream bed was present along the site boundary (see Photograph 3). However, in 2024 the area was enclosed with a wire fence in order to define and protect the site boundaries, and this situation continued in the same manner in 2025. (see Photograph 4).

Photograph 3 Streambed Between 2020 and 2021

Photograph 4 Streambed Excluded from the Area by a Fence in 2025

11. INVASIVE ALIEN SPECIES ASSESSMENT

Invasive Alien Species (IAS) are organisms that are intentionally or unintentionally introduced by humans outside their natural geographic distribution ranges and cause ecological, economic, or social impacts in their new environments. The introduction and spread of IAS are largely driven by globalization, including increased trade, transportation, and human mobility. For example, marine shipping, insects transported through timber and wood products, or the introduction of ornamental plants into new areas contribute significantly to this process. To address these challenges effectively, the European Union (EU) has established Regulation (EU) No 1143/2014 on the prevention and management of the introduction and spread of invasive alien species.

Ecological Impacts

Invasive alien species may cause severe ecological impacts within the ecosystems they invade. The absence of natural predators in the new environment allows these species to reproduce and spread rapidly. In addition, IAS may:

- Act as vectors for diseases,
- Compete with native species or predate upon them,
- Alter food webs and ecosystem dynamics,
- Cause ecosystem transformations by modifying soil composition or creating fire-prone habitats.

These impacts may result in the local or global extinction of native species and ultimately lead to significant ecological degradation.

Socio-Economic Impacts

The socio-economic impacts of invasive alien species are also substantial. Within the European Union, IAS are estimated to cause approximately EUR 12 billion in damages annually, due to impacts on human health, damage to infrastructure, and losses in agricultural productivity.

Species Occurrence and Threat Level in Europe

More than 12,000 alien species have been recorded in Europe, of which approximately 15% are considered invasive. IAS represent the third most significant threat to threatened species in Europe. According to a 2015 report, 354 threatened species (229 animal species, 124 plant species, and 1 fungal species) are directly affected by IAS, corresponding to 19% of all threatened species in Europe. The EU Biodiversity Strategy emphasizes the importance of addressing this threat by proposing the management of established invasive alien species and aiming to reduce by 50% the number of Red List species threatened by IAS by 2030.

Legal and Management Framework

In 2013, the European Commission proposed an EU Regulation addressing invasive alien species. This regulation focuses on preventing the introduction of IAS, establishing early warning and rapid response mechanisms, and implementing effective and coordinated management measures. Since 2016, the International Union for Conservation of Nature (IUCN) has been providing technical and scientific support for the implementation of the EU IAS Regulation through a series of service contracts with the European Commission and collaboration with the IUCN Invasive Species Specialist Group (ISSG).

Preventive Measures

As a result of the studies conducted, no invasive alien species were identified within the project area. In the event that an invasive species is detected in the future, an "Invasive Species Procedure" shall be prepared and implemented accordingly.

12. CRITICAL HABITAT ASSESSMENT

Critical Habitats are areas with high biodiversity value and may include one or more of the following characteristics:

(i) Habitat of significant importance to Critically Endangered and/or Endangered species;

(ii) Habitat of significant importance to endemic and/or restricted-range species;

(iii) Habitat supporting globally significant concentrations of migratory species and/or congregatory species;

(iv) Highly threatened and/or unique ecosystems; and/or

(v) Areas associated with key evolutionary processes.

Critical Habitats are areas with high biodiversity value that may contain one or more of the five values specified under IFC Performance Standard 6, and/or other recognized high biodiversity values. The Critical Habitat criteria outlined below form the basis of any Critical Habitat assessment.

Critical Habitat Criteria

Criterion 1: Critically Endangered (CR) and/or Endangered (EN) Species

Criterion 2: Endemic and/or Restricted-Range Species

Criterion 3: Migratory and/or Congregatory Species

Criterion 4: Highly Threatened and/or Unique Ecosystems

Criterion 5: Key Evolutionary Processes

Criterion 1: Critically Endangered (CR) and/or Endangered (EN) Species

Species that are globally threatened with extinction and listed as Critically Endangered (CR) or Endangered (EN) on the IUCN Red List are considered under Criterion 1. CR species face an extremely high risk of extinction in the wild, while EN species face a very high risk of extinction in the wild.

Tier 1 Sub-Criteria for Criterion 1:

➢ The habitat necessary to sustain at least 10% of the global population of a CR or EN species, where the species is regularly found, should be considered as a management unit.
➢ Known and regularly inhabited habitats of CR or EN species should be located in one of 10 or fewer independent management areas worldwide.

Tier 2 Sub-Criteria for Criterion 1:

➢ Habitat where a CR species is regularly found, or habitat with significant regional concentrations of EN species, should be considered as an independent management unit.
➢ For CR or EN species with a wide distribution or uncertain population dynamics, the loss of habitat potentially affecting the long-term survival of these species should be considered.
➢ National or regional significant concentrations of CR, EN, or equivalent species listed nationally/regionally should be included as critical habitats

Criterion 2: Endemic and/or Species with Restricted Distributions

An endemic species is one whose global distribution is ≥ 95% within the analyzed country or region.

Tier 1 Sub-Criteria for Criterion 2:

➢ This habitat should sustain at least 95% of the global population of an endemic or restricted-range species, and it should be considered as an independent management unit (e.g., a single site endemic).

Tier 2 Sub-Criteria for Criterion 2:

➢ This habitat should sustain at least 1%, but less than 95%, of the global population of an endemic or restricted-range species and should be considered as an independent management unit based on sufficient data or expert judgment.

Criterion 3: Migratory and Congregatory Species

Migratory species are those whose individuals, or a significant portion of the population, move cyclically and predictably from one geographic area to another, including within the same ecosystem. These movements are typically related to feeding, breeding, or other life cycle requirements.

Congregatory species are those whose individuals gather in large groups based on cyclical or other regular and/or predictable patterns. Examples include:

➢ Colonial species: Species that form large groups for breeding, shelter, or feeding.
➢ Species that form colonies for breeding purposes and/or gather large numbers of individuals for non-reproductive reasons (e.g., feeding, sheltering).
➢ Species that pass through narrow bottleneck areas during migration: For instance, species passing through critical transitional regions during migration.
➢ Species with large distributions but clustered populations: Species that concentrate the majority of their population in one or a few areas, while the remaining population is more dispersed.
➢ Source populations: Areas that support populations whose individuals contribute significantly to breeding in other regions.

Tier 1 Sub-Criterion for Criterion 3:

> ➢ A habitat must be known to support ≥ 95% of a migratory or congregatory species' global population during any phase of its life cycle, on a cyclical or regular basis, and must be considered an independent management unit for that species. This indicates that the habitat is critically important for the species and sustains a large portion of the global population.

Tier 2 Sub-Criteria for Criterion 3:

> ➢ A habitat may support ≥ 1% but < 95% of the global population of a migratory or congregatory species during any phase of its life cycle, on a cyclical or regular basis, and must be considered an independent management unit for that species, with sufficient data and/or expert opinion to support this conclusion.
> ➢ Habitats that meet BirdLife International's A4 Criterion or Ramsar Criteria 5 or 6 for Identifying Wetlands of International Importance.
> ➢ For species with large distributions but clustered populations, a temporary threshold has been set for habitats that support ≥ 5% of the global population. This threshold reflects the importance of these habitats in concentrating a significant portion of the species' population.
> ➢ Source areas: Habitats that support ≥ 1% of the global population of a species and contribute significantly to the breeding populations in other regions. Protecting these source areas is crucial for the species' long-term survival.

Criterion 4: Highly Threatened and/or Unique Ecosystems

Highly threatened or unique ecosystems are those that (i) are at significant risk of a substantial reduction in their area or quality; (ii) occupy a small spatial area; and/or (iii) contain unique communities of species, often concentrated in a specific biome, that are restricted in distribution. These ecosystems may be considered critical habitats based on systematic conservation planning techniques, which are carried out by qualified institutions such as government agencies, recognized academic institutions, and internationally acknowledged civil society organizations, through landscape or regional-scale studies.

An example of a unique ecosystem is a lowland dipterocarp forest, which is found in very limited areas. A highly threatened ecosystem could be one that loses a significant proportion of its area every year.

The identification of highly threatened or unique ecosystems is based on several factors that determine their importance for conservation. The prioritization of rare and threatened ecosystems uses criteria similar to those applied in the IUCN Red List of Threatened Species. Factors such as long-term trends, rarity, ecological condition, and the level of threat are considered. These factors enhance the relative biodiversity and conservation value of the ecosystem.

The IUCN Ecosystem Management Commission is actively working to establish criteria and categories for threatened ecosystems.

For regional biodiversity conservation efforts, ecosystems are classified and mapped based on their vegetation structure, composition, land use, and major abiotic factors such as climate, hydrology, geochemistry, and landscape position (e.g., slope and aspect). The data used to create these regional ecosystem maps typically include vegetation and land use maps, along with other environmental factors such as climate, hydrology, and geochemical conditions.

Criterion 5: Key Evolutionary Processes

The structural features of a region, such as its topography, geology, soil, temperature, and vegetation, along with the combinations of these variables, can influence the evolutionary processes of regional species and ecological characteristics. In some cases, spatial elements that are unique or characteristic of the landscape are associated with genetically distinct populations or subpopulations of plant and animal species. Physical or spatial features are defined as reserves or spatial catalysts for evolutionary and ecological processes, and such features are often linked to species diversification. The conservation of these key evolutionary processes and the species (or subspecies) that result from them has become a central focus of biodiversity conservation efforts in recent years, with a particular emphasis on preserving genetic diversity. By conserving species diversity in a landscape, the processes that facilitate the evolution of species and the genetic diversity within species are ensured, providing evolutionary flexibility in a system, which is especially important in the context of rapidly changing climate conditions.

Therefore, this criterion identifies (i) the physical characteristics of the landscape that can be associated with specific evolutionary processes, and/or (ii) species subpopulations that require special conservation due to their evolutionary or morphogenetic differences and unique evolutionary histories. The latter includes Evolutionarily Significant Units (ESUs) and Evolutionarily Distinct and Globally Endangered (EDGE) species (IFC, 2012).

According to the studies and literature reviewed, no target species or critical habitats have been identified in the project area, and none of the criteria mentioned above are triggered.

13. CONCLUSIONS AND RECOMMENDATIONS

No sensitive or threatened species or habitats were identified within the premises of İzdemir Enerji A.Ş., located within the administrative boundaries of Aliağa District, İzmir Province.

The facility is situated in an area predominantly characterized by logistics, commercial, and industrial activities. The evaluation of such facilities in terms of biological sustainability is important in order to understand their environmental impacts and the potential long-term consequences of these impacts on nature and ecosystems.

1. Waste Management and Recycling

The proper management of waste generated within the İzdemir Enerji A.Ş. facility constitutes a fundamental component of biological sustainability. Recycling of waste and its treatment in an environmentally sound manner can reduce adverse environmental impacts. In addition, the effective management of hazardous waste contributes to the protection of local ecosystems. In this context, İzdemir Enerji A.Ş. has provided waste management, and it is recommended that such training programs be continued in the coming years.

2. Energy Consumption and Carbon Footprint

Energy consumption at İzdemir Enerji A.Ş., particularly energy use based on fossil fuels, may increase the carbon footprint and exacerbate impacts related to climate change. The adoption of renewable energy sources, implementation of energy efficiency measures, and promotion of sustainable transportation systems are of critical importance for environmental sustainability.

3. Impacts on Biodiversity

The impacts of İzdemir Enerji A.Ş. on biodiversity in the surrounding area are directly related to the size and structural configuration of the facility. High-intensity industrial activities may reduce or eliminate the habitats of local species. This situation can disrupt ecosystem functionality and lead to the deterioration of the local ecological balance.

Within the scope of collaboration with educational institutions aimed at supporting biodiversity, İzdemir Enerji A.Ş. has organized biodiversity awareness and training activities at nearby schools and educational centers.

It is recommended that future biodiversity training activities be conducted by a biologist with relevant professional expertise.

Photographs provided below present examples of the activities carried out.

Photograph 5 Studies Conducted İn Collaboration With Educational İnstitutions

4. Monitoring and Evaluation

In order to ensure biological sustainability within the İzdemir Enerji facility, regular monitoring and evaluation systems should be established. Conducting these monitoring activities annually during spring and autumn will enhance the detection of flora and fauna species and enable more accurate and reliable ecological assessments of the area.

5. Community Engagement and Environmental Awareness

In line with recommendations provided in previous years, awareness-raising activities have been implemented to enhance community engagement. Employees of İzdemir Enerji. and nearby communities have been trained and informed on biological sustainability issues. It is recommended that future biodiversity training programs be delivered by a qualified biologist to ensure scientific accuracy and effectiveness.

6. Biodiversity Monitoring Findings and Assessment

Flora and fauna monitoring studies conducted within the İzdemir Enerji project area and its immediate surroundings between 2020 and 2025 were carried out to monitor the dynamic structure of terrestrial ecosystems in the region, to assess the potential impacts of project activities on biodiversity, and to identify changes in species composition. The monitoring activities included seasonal observations, species identification, and habitat assessments.

The findings indicate that none of the species recorded within the project area are endemic and that all identified species fall under the "LC (Least Concern)" or "NE (Not Evaluated)" categories according to the IUCN Threat Categories. In addition, none of the species were found to be protected under the CITES or Bern Conventions. These results demonstrate that no rare, threatened, or conservation-priority taxa are present within the project area.

An evaluation of species records by year shows that the floristic composition remained stable in 2020 and 2021, with the same six species recorded in both years. This indicates that habitat conditions within the project area did not change significantly during this period and that sampling activities were conducted with a similar scope. In 2024, the increase in the number of recorded species to 15 indicates a notable rise in floristic diversity. This increase may be associated with seasonal or soil-related variations within the natural vegetation cover of the area. In 2025, the recording of only one additional species (*Convolvulus arvensis*) suggests that the floristic composition has reached a certain level of saturation.

An examination of the taxonomic distribution of floristic components revealed that the family Asteraceae was the most species-rich family. The high representation of this family within the area is generally attributed to its inclusion of species that are ruderal and tolerant to anthropogenic disturbance.

From an ecological perspective, the majority of species identified within the project area are plants capable of adapting to ruderal and mesic–xeric conditions.

From a conservation and monitoring standpoint, the absence of endemic or threatened species within the study area indicates that the current floristic composition presents a low ecological risk.

In conclusion, the floristic studies conducted between 2020 and 2025 reveal the dominance of a flora characterized by low to moderate diversity, resistance to anthropogenic pressure, and a predominantly ruderal structure. Based on the available data, the impact of İzdemir Enerji A.Ş. on flora is considered to be low, and it is assessed that no significant conservation risk exists in terms of ecosystem integrity.

An evaluation of the species identified as a result of avifauna observation studies indicates that the area hosts an avifauna largely composed of widespread bird species adapted to anthropogenic environments.

None of the recorded species are endemic, and all are classified under the "LC (Least Concern)" or "NE (Not Evaluated)" categories of the IUCN Red List. This indicates that no globally threatened or conservation-priority bird species are present within the study area. In addition, none of the species are listed under CITES, while some species are protected under Annex II or Annex III of the Bern Convention. The presence of these species indicates that the area provides suitable habitat conditions for common species frequently observed across Türkiye.

Studies conducted in 2020 and 2021 produced parallel results, with the same seven species recorded in both years (*Columba livia, Spilopelia senegalensis, Streptopelia decaocto, Corvus cornix, Pica pica, Delichon urbicum, Passer domesticus*). This suggests that sampling conditions and habitat structure did not undergo significant changes during this period and that the avian community structure remained stable.

In 2024, the number of recorded species decreased from seven to four. This decline may be attributed to seasonal differences or variations in observation intensity. However, the species recorded in 2024 consist entirely of taxa previously documented in earlier years, indicating that no floristic or habitat-based degradation occurred.

In 2025, the number of species increased again to six, with the re-observation of *Corvus cornix* and *Spilopelia senegalensis*, demonstrating the continued overall stability of the avifauna within the area. The fact that all species recorded during this year were resident species indicates that suitable habitat conditions are maintained throughout the year.

Considering habitat preferences, the recorded bird species are characterized by a high capacity for urban adaptation and the ability to breed easily in open areas, settlement surroundings, and near industrial structures. This supports the characterization of the project area as possessing disturbed and semi-urban habitat features compatible with human activities.

Overall, the avifauna identified within the project area between 2020 and 2025 exhibits low species richness but ecological stability. The area provides sufficient shelter and foraging opportunities to meet the basic life requirements of bird species. The absence of endemic or threatened species indicates that the potential impact of İzdemir Enerji A.Ş. on existing bird communities is low.

As part of herpetofauna monitoring studies, reptile species identified within the project area and its immediate surroundings were evaluated. The species composition determined throughout the monitoring years generally shows similarity.

None of the recorded species were identified as endemic. In terms of conservation status, Stellagama stellio, Hemidactylus turcicus, and Lacerta trilineata are classified as LC under the IUCN categories, while Testudo graeca is classified as VU. According to CITES, only Testudo graeca is listed under Appendix II. Under the Bern Convention, *Stellagama stellio* and *Lacerta trilineata* are listed in Annex II, *Hemidactylus turcicus* in Annex III, and *Testudo graeca* in Annex II.

During the 2024 monitoring study, *Stellagama stellio* and *Hemidactylus turcicus* were reported within the boundaries of the İzdemir Enerji project area. In 2025, Stellagama stellio and *Lacerta trilineata* were reported. These findings indicate that partially suitable habitat conditions are maintained within the project area.

No changes were detected in the conservation or threat status of the species compared to previous years. These results demonstrate that the reptile communities surrounding the project area are temporally stable and that project activities have not caused a significant adverse impact on habitat integrity.

In summary, the species identified during monitoring studies conducted between 2020 and 2025 are all widespread representatives of Türkiye's herpetofauna and are compatible with the environmental conditions of the area.

During the 2020 monitoring period, *Bufo bufo*, *Bufotes variabilis*, and *Pelophylax ridibundus* were recorded. None of these species are endemic. According to the IUCN Red List, Bufo bufo and *Pelophylax ridibundus* are classified as LC, while *Bufotes variabilis* is classified as DD. None of the species are listed under CITES, and all are included in Annex III of the Bern

Convention. During this period, Bufo bufo was directly observed within the boundaries of the İzdemir Enerji project area.

As a result of the 2021 monitoring studies, the presence of the same three species was again confirmed. However, no direct observations were made within the project area boundaries during this year, and species were found to be distributed primarily in surrounding habitats, particularly near water sources. No changes were observed in the IUCN, Bern, or CITES status of the species.

During the 2024 monitoring activities, species diversity was consistent with previous years. Bufo bufo, *Bufotes variabilis*, and *Pelophylax ridibundus* were again recorded, and the area was assessed to have a stable amphibian fauna structure. No direct observations were made within the İzdemir Enerji boundaries during this year.

In the 2025 monitoring period, the presence of the same three species was once again confirmed, indicating the continued availability of suitable habitat conditions in the vicinity of the project area. No changes were detected in the IUCN or Bern status of the species compared to previous years.

Overall, the monitoring results obtained between 2020 and 2025 indicate that the amphibian fauna composition has remained largely stable over time. All species are widely distributed throughout the region, and their habitat preferences are compatible with agricultural irrigation channels, drainage lines, and temporary water accumulations. Under current conditions, it is assessed that no permanent adverse impact on amphibian species has occurred. However, the protection of aquatic microhabitats in the vicinity of the project area during the breeding periods of *Bufo bufo* is recommended to ensure population continuity.

Within the scope of mammal fauna monitoring studies conducted in the project area and its surroundings, no significant changes in species diversity were identified between monitoring years. The presence of the same seven mammal species was confirmed in all four monitoring periods. These species belong to the families Rhinolophidae, Vespertilionidae, and Muridae, representing the typical mammalian fauna of the region.

Three species from the family Rhinolophidae were recorded: *Rhinolophus ferrumequinum*, *Rhinolophus hipposideros*, and *Rhinolophus blasii*. All three species are classified as LC under IUCN criteria and are not considered threatened. However, all are listed under Annex II of the Bern Convention, emphasizing the need for their protection. Annual monitoring studies confirmed that these species were actively observed within the project area and its surroundings, particularly roosting in abandoned structures or tree cavities near open areas.

The species *Pipistrellus pipistrellus* from the family Vespertilionidae was also recorded in all monitoring years. This small bat species is widely distributed in both rural and semi-urban habitats. It is classified as LC by the IUCN and listed under Annex III of the Bern Convention. No decline in distribution or abundance was detected during the monitoring period, and its presence was consistently confirmed through ultrasonic detector recordings conducted during evening hours.

With respect to rodent fauna, three species from the family Muridae were identified: *Rattus norvegicus*, *Rattus rattus,* and *Mus macedonicus*. All three species are widespread and adapted to human settlements. They are classified as LC and do not have any special protection status under the Bern Convention or CITES.

Overall, the monitoring results between 2020 and 2025 indicate a stable mammal species composition within the project area. All recorded species are regionally common, and no evidence of population decline or habitat loss was detected for any species. In this context, project activities are considered not to have caused adverse impacts on mammal fauna during the monitoring period. Nevertheless, from an ecological perspective, it is considered beneficial to continue monitoring efforts while preserving potential bat roosting habitats (e.g. building voids and abandoned structures).

Conclusion

Although no sensitive species or habitats have been identified within the operational site of İzdemir Enerji A.Ş., the company has taken significant steps to support the conservation and enhancement of biodiversity. Waste management and recycling practices, measures aimed at reducing energy consumption, and biodiversity awareness trainings conducted in cooperation with educational institutions constitute concrete examples of these efforts.

In addition, the planning of regular monitoring and evaluation activities, as well as proposals for the establishment of a biodiversity education center, are expected to enhance the long-term environmental sustainability of the facility while also contributing to the environmental awareness of local communities in the region.

Within this context, the species numbers obtained as a result of the monitoring and evaluation studies conducted between 2020 and 2025 are presented in the table below.

Table 15 Number of Species Obtained from Studies Conducted Between 2020 and 2025

Species Numbers by Years				
	2020	**2021**	**2024**	**2025**
Flora	6	6	15	16
Amphibia	1	0	0	1
Reptilia	0	0	2	2
Aves	7	7	4	6
Mammalia	7	7	7	7

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