Dampınar Wind Power Plant (WPP) Project

Supplementary Biodiversity Surveys Final Report

May 2025

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Dampınar Wind Power Plant (WPP) Project

Supplementary Biodiversity Surveys Final Report

May 2025

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Definitions and Abbreviations

Abbreviation	Definition
AoI	Area of Influence
AZE	Alliance for Zero Extinction
BAP	Biodiversity Action Plan
BERN	The Convention on the Conservation of European Wildlife and Natural Habitats
BMP	Biodiversity Management Plan
CHA	Critical Habitat Assessment
CITES	Convention for the International Trade in Endangered Species of Wild Fauna and Flora
CR	Critically Endangered
CRM	Collision Risk Model
DD	Data Deficient
DKMP	General Directorate of Nature Conservation and National Park
EBRD	European Bank for Reconstruction and Development
EIA	Environmental Impact Assessment
EN	Endangered
ESIA	Environmental and Social Impact Assessment
ETL	Energy Transmission Line
EU	European Union
EUNIS	European Nature Information System
GIS	Geographic Information Systems
GN	Guidance Notes
IBA	Important Bird Area
IFC	International Finance Cooperation
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
LC	Least Concern
MoENR	Ministry of Energy and Natural Resources
NP	National Park
NT	Near Threatened
PBF	Priority Biodiversity Features
PCFM	Post-construction Fatality Monitoring
PR	Performance Requirement
PS	Performance Standard
Ramsar	Convention on Wetlands of International Importance Especially as Waterfowl Habitat
SP	Sampling Point for ground static acoustic bat surveys
T	Turbine
TRDB	Turkish Red Data Book
VES	Visual Encounter Survey

Abbreviation	Definition
VP	Vantage Point
VU	Vulnerable
WPP	Wind Power Plant

Executive summary

Dampınar Wind Power Plant (WPP) Project (“the Project”) with 11 turbines and 46.2 MWm/46.2 MWe total installed power, is planned to be established by Enerjisa Üretim. As a result of the Environmental and Social Impact Assessment (ESIA) study conducted by the Consultant, biodiversity data gaps were identified for the Project’s compliance with the applicable national and international standards. Supplementary biodiversity baseline collection was carried out by the Project Company in 2024. The draft final report presents flora, terrestrial fauna, bird and bat survey results and outcomes for the study period.

For the baseline collection of herpetofauna during the spring, and summer, seasons, fieldwork commenced in the early morning at daylight and continued until dusk to account for nocturnal species. With the exception of *Testudo graeca*, which is classified as Vulnerable (VU) by the IUCN and listed in CITES Annex-II, other herpetofauna species are classified as Least Concern (LC), indicating no significant extinction risk. There are no endemic herpetofauna species among the identified species.

For the baseline collection of terrestrial mammal species during the spring and summer seasons of 2024, a total of 20 fieldwork days were conducted. Among the terrestrial mammal species identified in the Project Area of Influence, 5 species are listed in Annex II, 11 species in Annex III of the Bern Convention. 3 species in Annex III, 1 Species Annex I and 2 Species Annex II of CITES. According to the IUCN Red List, no species in the area is classified as endangered, with 2 species categorized as Vulnerable (VU) and 2 species categorized as Near Threatened (NT). Vulnerable species have been recorded as literature.

The flora field studies identified a total of 1 regional endemic (*Scutellaria orientalis* subsp. *carica*) and 1 rare distribution but not endemic (*Cyclamen hederifolium*) plant species. No direct observations were recorded during the field studies. Due to habitat similarities, their presence in the access road and ETL areas is also considered likely, despite the absence of direct observations. *Cyclamen hederifolium* is a species that is difficult to produce from seed and is usually protected by translocation. Since direct habitat loss will not occur due to Project footprint, translocation was not carried out. However, it is recommended to continue monitoring the population due to dust impact. The population of the species is in good condition in the areas where it is distributed in the region.

For the baseline collection of bird species, NatureScot VP surveys at turbines and ETL and breeding bird surveys via transect and point counts were carried out in spring, summer and autumn. Surveys revealed low migratory rates for 2024 survey period, and medium collision risk estimations for resident species based on this year’s results. ETL segment with higher collision hazard was identified. Additional mitigation and monitoring approaches were recommended.

For the baseline collection of bat species, NatureScot ground static acoustic surveys were carried out in spring, summer and autumn, in addition to transect surveys covering turbine areas. Surveys captured low overall bat activity however due to access issues to turbine zero locations for the most part, the results should be considered indicative. Turbine zero sampling results from autumn are available for comparison. Additional mitigation and monitoring approaches were recommended.

1 Introduction

1.1 Project Background

Enerjisa Üretim Santralleri Anonim Şirketi has been awarded to invest in the Aydın Connection Region on 30 May 2019 within the scope of "Renewable Energy Resource Areas (YEKA) Regulation" and "Allocation of Wind Energy Based Renewable Energy Resource Areas (YEKA) and Total Connection Capacities"[1]. Upon this award, a "YEKA Use Rights Agreement" was signed between Enerjisa Üretim Santralleri Anonim Şirketi and Ministry of Energy and Natural Resources (MoENR) on 09 March 2020. Subsequently, the "YEKA Use Rights Agreement" signed by Enerjisa Üretim Santralleri Anonim Şirketi for the Aydın Connection Region was transferred to Enerjisa Enerji Üretim Anonim Şirketi ("Enerjisa Üretim" or "the Project Company") with the transfer agreements signed on 03 June 2021.

Dampınar Wind Power Plant (WPP) Project ("the Project") with 11 turbines and 46.2 MWm/46.2 MWe total installed power, is planned to be established by Enerjisa Üretim in İzmir Province, Tire District, Küçükkale Neighbourhood and Aydın Province, Germencik District, Dampınar Neighbourhood. The Project components consist of 11 turbines, a switchyard, Project roads (i.e., access and site roads) and an energy transmission line (ETL) as a Project associate facility. The Project is part of a nine-project wind energy investment package initiated by Enerjisa Üretim which has a 750 MW total installed power from a total of 180 wind turbines located in Aegean and Marmara Regions of western Türkiye; aiming to evaluate and utilize the wind energy potential of the region and contribute to the national strategy and regional economy.

The Enerjisa YEKA Nine Wind Power Plants (WPPs) projects have undergone Environmental and Social Impact Assessment (ESIA) and Critical Habitat Assessment (CHA) studies, conducted by Mott MacDonald ("Consultant"), also including Biodiversity Management Plan (BMP) development. However, due to limitations identified in the baseline data during the ESIA studies, supplementary biodiversity field surveys were deemed necessary. Consequently, Enerjisa Üretim has commissioned Mott MacDonald Türkiye to develop the site-specific baseline collection methodologies and conduct field studies accordingly. Supplementary baseline studies were conducted for each WPP, as details are provided throughout this report, managed by expert teams using relevant methodologies.

1.2 Scope of Study

As a result of the ESIA study conducted by the Consultant, biodiversity data gaps were identified for the Project's compliance with the applicable national and international standards as presented in Section 2. Supplementary biodiversity collection methodologies for flora and fauna were subsequently developed by the Consultant and field surveys were scheduled in 2024 to address biodiversity data gaps which would (1) enhance the Project biodiversity baseline to provide reliable and robust results, (2) enable revisions of CHA and BMP, (3) provide clarifications with regards to implementation of mitigation hierarchy and (4) conduct operation phase monitoring for the Project. The supplementary biodiversity surveys cover the period between March and November, which represents three seasons, spring, summer, and autumn.

[1] Published in the Official Gazette Date/No: 07.11.2018/30588

2 Applicable Guidelines and Standards

2.1 National Requirements

The primary framework of the Turkish legislation for environmental legislation is the Environmental Law (Law No: 2872). National laws and regulations regarding protection of the habitats and species are listed in Table 2-1.

Table 2-1 National Legislation on Biodiversity

Legislation (Official Gazette Date/Number - Last Revision Date)	National Strategy Documents
Law on National Parks (11.08.1983/18132 - 09.07.2018) Terrestrial Hunting Law (11.07.2003/25165 - 28.10.2020) Law on Animal Protection (01.07.2004/25509 - 13.12.2010) Regulation on the Protection of Wetlands (04.04.2014/28962 - 23.06.2022) Regulation for Implementing the Convention on International Trade in Endangered Species of Wild Fauna and Flora (27.12.2001/24623 - 20.07.2019) Regulation on Protection of Wildlife and Wildlife Development Areas (08.11.2004/25637) Law on Protection of Cultural and Natural Assets (23.07.1983/18113 - 15.06.2022) Regulation on Collection, Protection and Usage of Plant Genetic Resources (19.07.2012/28358) Law on Fisheries (04.04.1971/ 13799 - 17.02.2021) The Environmental Protection Agency for Special Areas (08.07.2011/ 27988) Environment Law (11.08.1983 / 18132 - 15.06.2022) Forestry Law (08.09.1956 / 9402 - 25.12.2021) Law on Pasture (28.02.1998 / 23272 - 18.01.2019) Law on Coastal Areas Management (17.04.1990 / 20495 - 28.10.2020)	National Plan on on-site Protection of Plant Genetic Diversity (1998) National Environmental Action Plan (1999) National Forestry Program (2004) Climate Change Action Plan (2012) Turkish National Action Plan against Desertification (2015) National Rural Development Strategy (2015) National Biological Diversity Strategy and Action Plan (2019)

2.2 International Requirements

International agreements, conventions, and protocols regarding protection of the habitats and species are listed below:

- The Convention for the Protection of the Mediterranean Sea Against Pollution (Barcelona Convention) (1981)
- The Convention on the Conservation of European Wildlife and Natural Habitats (BERN) (1984)
- United Nations Framework Convention on Climate Change (1994)
- The Convention on Wetlands of International Importance especially as Waterfowl Habitat (RAMSAR) (1994)
- The UN Convention on Biological Diversity (1997) and Cartagena Protocol on Biosafety (2004)
- Kyoto Protocol (2009)
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (1996)
- Paris Agreement (2016)

2.3 Project Standards

The Project Company intends to develop the Project in alignment with the applicable international and national standards, and the policy and requirements of the Lenders (i.e., EP IV, IFC and EBRD standards).

The international lender standards concerning biodiversity for the Project are represented by the IFC Performance Standards (PS6) and related Guidance Note (6), EBRD Performance Requirements (PR6) and Guidance Note (6) as well as Equator Principles IV (EP IV).

The impact assessment and critical habitat assessment are carried out in accordance with the following international requirements:

- IFC Performance Standards on Environmental and Social Sustainability,
- EBRD's Environmental and Social Policy and Performance Requirements
- International Union for Conservation of Nature (IUCN) Red List of Threatened Species
- The Birds Directive (2009/147/EC)
- The Habitats Directive (92/43/EEC10)
- Post-construction Bird and Bat Fatality Monitoring for Onshore Wind Energy Facilities in Emerging Market Countries - Good Practice Handbook (2023)

The IFC PS6 objectives can be listed as:

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

Similarly, the EBRD PR6 objectives are as defined below:

- Protect and conserve biodiversity using a precautionary approach,
- Adopt the mitigation hierarchy in the design and implementation of projects with the aim of achieving no net loss, and where appropriate, a net gain of biodiversity,
- Maintain ecosystem services, and
- Promote good international practice in the sustainable management and use of living natural resources.

3 Methodology

3.1 Flora

3.1.1 Flora Methodology

In order to reveal the flora inventory in the study area, the studies were carried out in three steps. These are 1-Desktop studies (Basic Preparation), 2-Field studies, 3-Survey (interview) studies. The flora studies have been specifically concentrated on the ETL and Access Road areas, with research and seed collection efforts directed towards the target plant species found within these designated areas.

- Station selection and literature review were conducted utilizing geographic information systems (GIS).
- As part of the GIS studies, stations for point and transect observations were initially established using satellite images as a preliminary step.
- Previous flora studies near the study area were examined within the scope of literature survey. The Project's National EIA for flora includes a flora study covering turbine locations.
- For the flora assessment, satellite maps were initially analysed as part of the field study preparations. Subsequently, fieldwork was conducted to survey the terrain and habitats within the designated area.
- Information on the distribution of species was obtained from literature sources and this information was used as a base for further analysis. For flora species, the literature sources given in Section 6.1 were reviewed.
- The synonyms of the species were also taken into consideration in the literature review.
- Within the scope of literature survey, nationally protected and internationally recognized areas were investigated, such as Lesser Menderes Delta and Mahal Hills KBA.

Field Studies:

- Field studies were conducted in areas that were not surveyed previously, specifically in areas where target species could potentially be observed. The flora studies, as a supplementary component, have been primarily concentrated on the ETL and access road areas, while turbine locations may be considered but are not the primary focus of the study.
- The first phase of fieldwork was carried out primarily to verify the quality of the stations identified in the desktop studies. If deemed necessary in the preliminary field work, adjustments were made to the stations. Natural and semi-natural habitats in the Project area and its immediate surroundings were taken into consideration in determining the stations.
- Surveys were carried out in 2024 during the vegetation period, with the objective of thoroughly assessing and documenting the various plant species present within the study area. The studies utilized the region's 1:25,000 scale topographic map, satellite images, GPS device, camera, a notebook, and various materials for collecting plant samples in the field, including transparent bags, a hoe, pruning shears, a plant press, and seed envelopes.
- The field studies were primarily conducted along 500-meter transect lines, representing different habitats within the Project’s footprint and area of influence.
- During the field studies, the third-level EUNIS habitat types of the study area along each transect line were also identified.

The below steps were followed in the identification process of plant species:

- During the identification of plant specimens, various sources were used, First of all Flora of Turkey and the East Aegean Islands, as well as the digital version of the Flora of Turkey (Tübives) and other references given in Section 6.1.
- Latin and Turkish names, family information, and taxonomic classification were based on the book "Türkiye Bitkileri Listesi (Damarlı Bitkiler) [List of Plants of Turkey (Vascular Plants)]" published by the Turkish Flora Research Association in 2012.
- Recent publications and newly added taxon records to the Flora of Turkey have also been reviewed, and the study Important Plant Areas of Turkey has been referenced as well.
- References have also been made to The Plant List, Plants of the World Online, and the International Plant Name Index (IPNI), and Bizimbitkiler.org.
- When determining the national IUCN threat categories of the identified species and subspecies, both endemic and non-endemic rare taxa, the primary reference used was the Red Data Book of Turkish Plants. For determining the global IUCN threat categories, the official website of the IUCN Red List was used as the main reference.

3.1.2 Field Schedule

The survey was conducted in June, July and October. Seed collection was conducted in the months of June, July, and October, with the translocation of the species carried out in October. These activities were performed as part of the planned conservation and management efforts to ensure the successful relocation and preservation of the target species.

3.1.3 Survey Locations

For the purpose of evaluating floristic diversity within the scope of the Project, the boundaries of the study area were first defined. The study area was determined by considering all components and aspects of the Project, including land preparation, excavation works, installation and construction, transportation, energy production activities, any solid/liquid waste, dust, air emissions, noise, electromagnetic impacts, and the environmental effects and spread distances of these emissions. (See Table 3-1 and Figure 3-1)

Table 3-1 Flora Survey Location (Point and Transects)

Survey Point			Transect			
Station No	Survey Point	Nearest Project Element	Transect No	Transect Start Location	Transect End Location	Nearest Project Element
1	37°58'2.67"N - 27°30'29.61"E	Access Road	1	37°57'55.82"N - 27°30'30.12"E	37°58'7.38"N - 27°30'39.85"E	Access Road
2	37°58'13.10"N - 27°30'39.48"E	Access Road	2	37°58'8.81"N - 27°30'38.68"E	37°58'23.75"N - 27°30'39.12"E	Access Road
3	37°58'28.41"N - 27°30'43.08"E	Access Road	3	37°58'25.51"N - 27°30'41.68"E	37°58'33.18"N - 27°30'42.82"E	Access Road
4	37°58'34.70"N - 27°30'36.13"E	Access Road	4	37°58'25.44"N - 27°30'35.25"E	37°58'38.16"N - 27°30'41.05"E	Access Road
5	37°58'37.59"N - 27°30'30.04"E	Access Road	5	37°58'33.41"N - 27°30'21.06"E	37°58'39.71"N - 27°30'25.38"E	Access Road
6	37°59'10.41"N - 27°31'8.49"E	Access Road	6	37°59'2.85"N - 27°30'56.41"E	37°59'16.46"N - 27°31'16.66"E	Access Road

7	38° 0'30.06"N - 27°33'7.48"E	Access Road - T4 - T5	7	38° 0'22.94"N - 27°32'56.93"E	38° 0'29.67"N - 27°33'21.59"E	Access Road - T4 - T5
8	38° 0'37.57"N - 27°33'36.22"E	Access Road - T6 - T8	8	38° 0'34.75"N - 27°33'29.21"E	38° 0'38.19"N - 27°33'48.22"E	Access Road - T6 - T8
9	38° 0'6.83"N - 27°35'23.22"E	Access Road	9	38° 0'12.12"N - 27°35'16.51"E	38° 0'2.38"N - 27°35'22.77"E	Access Road
10	38° 0'22.18"N - 27°34'10.94"E	Access Road - T7 - Switch Yard	10	38° 0'28.53"N - 27°34'11.67"E	38° 0'16.40"N - 27°34'5.47"E	Access Road - T7 - Switch Yard
11	38° 0'6.19"N - 27°34'8.12"E	ETL - Switch Yard	11	38° 0'10.68"N - 27°34'10.85"E	37°59'53.75"N - 27°34'7.41"E	ETL - Switch Yard
12	37°59'58.24"N - 27°34'28.98"E	ETL	12	38° 0'4.47"N - 27°34'29.13"E	37°59'50.43"N - 27°34'31.29"E	ETL
13	37°59'42.71"N - 27°34'36.73"E	ETL	13	37°59'42.80"N - 27°34'36.24"E	37°59'30.18"N - 27°34'29.02"E	ETL
14	37°59'17.26"N - 27°34'43.93"E	ETL	14	37°59'22.14"N - 27°34'51.77"E	37°59'9.38"N - 27°34'42.18"E	ETL
15	37°58'46.33"N - 27°34'55.25"E	ETL	15	37°58'51.67"N - 27°34'57.79"E	37°58'42.13"N - 27°35'4.47"E	ETL
16	37°58'32.31"N - 27°35'12.44"E	ETL	16	37°58'35.45"N - 27°35'9.57"E	37°58'22.99"N - 27°35'11.48"E	ETL
17	37°58'1.02"N - 27°35'28.78"E	ETL	17	37°58'6.85"N - 27°35'27.29"E	37°57'53.62"N - 27°35'33.20"E	ETL
18	37°57'35.02"N - 27°35'36.63"E	ETL	18	37°57'42.87"N - 27°35'33.65"E	37°57'30.78"N - 27°35'45.02"E	ETL
19	37°57'10.85"N - 27°36'21.98"E	ETL	19	37°57'19.70"N - 27°36'24.00"E	37°57'2.11"N - 27°36'20.06"E	ETL
20	37°56'4.24"N - 27°36'11.50"E	ETL	20	37°56'11.63"N - 27°36'16.94"E	37°55'58.45"N - 27°36'15.81"E	ETL
21	37°55'30.05"N - 27°36'24.45"E	ETL	21	37°55'39.33"N - 27°36'23.41"E	37°55'26.06"N - 27°36'21.39"E	ETL

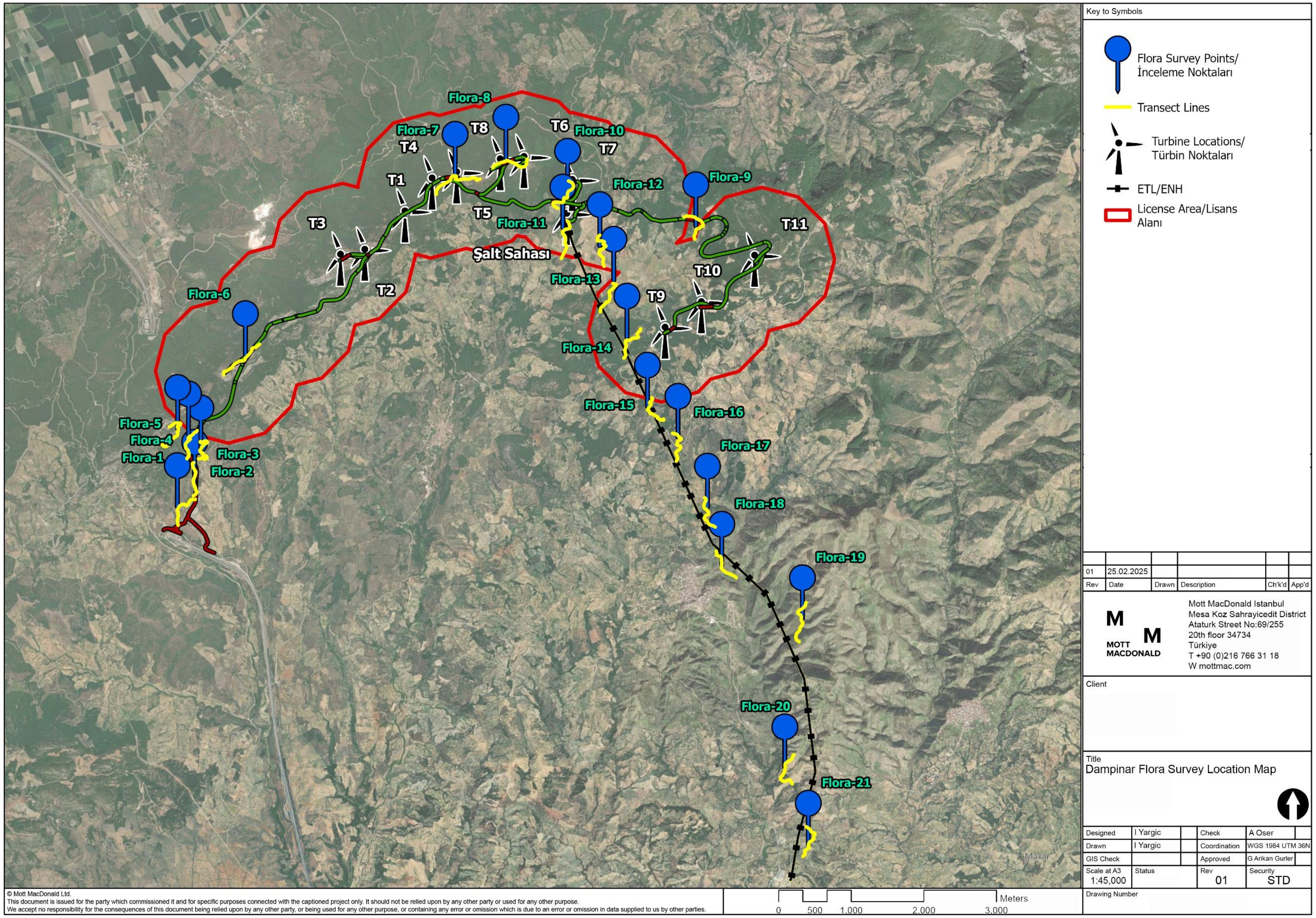

Figure 3-1 Flora Survey Location Map

3.2 Terrestrial Mammal

3.2.1 Terrestrial Mammal Methodology

In order to reveal the terrestrial mammal inventory in the study area, the studies were carried out in three steps. These are 1-Desktop studies (Basic Preparation), 2-Field studies, 3-Survey (interview) studies. The terrestrial mammal studies, as a supplementary component, have been specifically concentrated on the ETL and Access Road areas, with research efforts focused on identifying suitable locations for camera traps and transects, while turbine locations may be considered but are not the primary focus of the study.

Desktop Studies:

- Station selection and literature review were conducted utilizing GIS.
- As part of the GIS studies, point and transect locations were initially determined using satellite imagery for preliminary preparation.
- Previous terrestrial mammal studies near the study area were examined within the scope of literature review.
- For terrestrial mammal, firstly, satellite maps were analysed within the scope of field preparation studies.
- As part of the field preparation for terrestrial mammal, satellite maps were initially analysed. Subsequently, fieldwork was conducted to assess the status of the species and their relationship with the habitat. The precise locations of the stations were determined during the fieldwork.
- Information on the distribution of species was obtained from literature sources and this information was used as a base. The literature sources given in Section 6.2 were reviewed.
- The synonyms of the species were also taken into consideration in the literature review.
- Within the scope of literature reviews, nationally protected and internationally recognized areas were investigated and surveyed.

Field Studies:

- Field studies were conducted in areas that were not surveyed previously. The terrestrial mammal studies, as a supplementary component, have been specifically concentrated on the, ETL and access road area. while turbine locations may be considered but are not the primary focus of the study.
- The first phase of field studies for terrestrial mammals aimed to assess the suitability of camera trap and transect locations identified in the desktop studies. Stations were relocated, if necessary, with consideration given to natural and semi-natural habitats in and around the Project area.
- Terrestrial Mammal field studies was conducted in two main parts. Direct observation (camera trap) and Indirect observation (Footprints, faeces, and body hair).
- In the field studies habitats suitable for mammals were identified and observations were made for a total of 20 days according to the size of the habitat.
- Paths that could be the passage routes of medium and large mammals etc. were checked for camera trap installation. Camera traps were installed at points where animal signs (tracks, feces etc.) were seen.
- Indirect observation was made on the existing roads and footpaths within the Area of Influence.
- Camera traps remained in the field for 15 consecutive days at each survey point in April 2024 and 5 consecutive days in May 2024.

3.2.2 Field Schedule

A total of 20 days of survey was conducted in 2024 during the active season (April and May) for terrestrial mammals to thoroughly assess and document the terrestrial mammal species present within the study area. The field survey was strategically planned to align with the period of increased terrestrial mammal activity, ensuring that observation of the mammal species, including both common and rare species, could be accurately recorded. This timing facilitated the identification of potential habitats and the collection of relevant data regarding species distribution and behaviour.

3.2.3 Survey Locations

For the purpose of evaluating terrestrial mammal diversity within the scope of the Project, the boundaries of the study area were first defined. The study area was determined by considering all components and aspects of the Project, including land preparation, excavation works, installation and construction, transportation, energy production activities, any solid/liquid waste, dust, air emissions, noise, electromagnetic impacts, and the environmental effects and spread distances of any emissions. (See Table 3-2 and Figure 3-2)

Table 3-2 Terrestrial Mammals Survey Locations (Camera Trap and Transect)

Camera Trap			Transect			
Station No	Camera Trap Point	Nearest Project Element	Transect No	Transect Start Location	Transect End Location	Nearest Project Element
1	37°58'5.55"N - 27°30'28.54"E	Access Road	1	37°57'55.87"N - 27°30'30.22"E	37°58'17.15"N - 27°30'40.50"E	Access Road
2	37°58'31.61"N - 27°30'34.41"E	Access Road	2	37°58'20.62"N - 27°30'40.45"E	37°58'38.32"N - 27°30'41.34"E	Access Road
3	37°59'14.23"N - 27°31'14.33"E	Access Road	3	37°59'3.13"N - 27°30'57.74"E	37°59'26.09"N - 27°31'25.38"E	Access Road
4	38° 0'27.53"N - 27°33'0.57"E	Access Road - T4 - T5	4	38° 0'26.07"N - 27°32'58.54"E	38° 0'37.58"N - 27°33'43.15"E	Access Road - T4 - T5 - T8 - T6
5	38° 0'15.85"N - 27°35'18.12"E	Access Road	5	38° 0'9.82"N - 27°35'16.25"E	38° 0'7.63"N - 27°35'31.70"E	Access Road
6	38° 0'12.55"N - 27°34'3.53"E	Access Road - ETL - Switch Yard	6	38° 0'28.31"N - 27°34'14.92"E	38° 0'3.91"N - 27°34'15.58"E	Access Road - ETL - Switch Yard - T7
7	37°59'37.01"N - 27°34'33.12"E	ETL	7	37°59'42.05"N - 27°34'37.54"E	37°59'23.02"N - 27°34'28.38"E	ETL
8	37°59'17.28"N - 27°34'32.53"E	ETL	8	37°59'24.57"N - 27°34'35.54"E	37°59'11.86"N - 27°34'43.28"E	ETL
9	37°58'41.17"N - 27°35'4.03"E	ETL	9	37°58'46.00"N - 27°34'57.11"E	37°58'28.03"N - 27°35'7.32"E	ETL
10	37°57'28.94"N - 27°35'58.03"E	ETL	10	37°57'44.37"N - 27°35'40.53"E	37°57'19.15"N - 27°35'59.65"E	ETL
11	37°56'47.02"N - 27°36'2.65"E	ETL	11	37°57'6.57"N - 27°36'11.61"E	37°56'34.04"N - 27°36'26.45"E	ETL

12	37°56'0.69"N - 27°36'24.49"E	ETL	12	37°56'14.87"N - 27°36'31.76"E	37°55'48.05"N - 27°36'20.18"E	ETL
13	37°55'25.58"N - 27°36'29.15"E	ETL	13	37°55'34.47"N - 27°36'16.04"E	37°55'28.71"N - 27°36'16.54"E	ETL

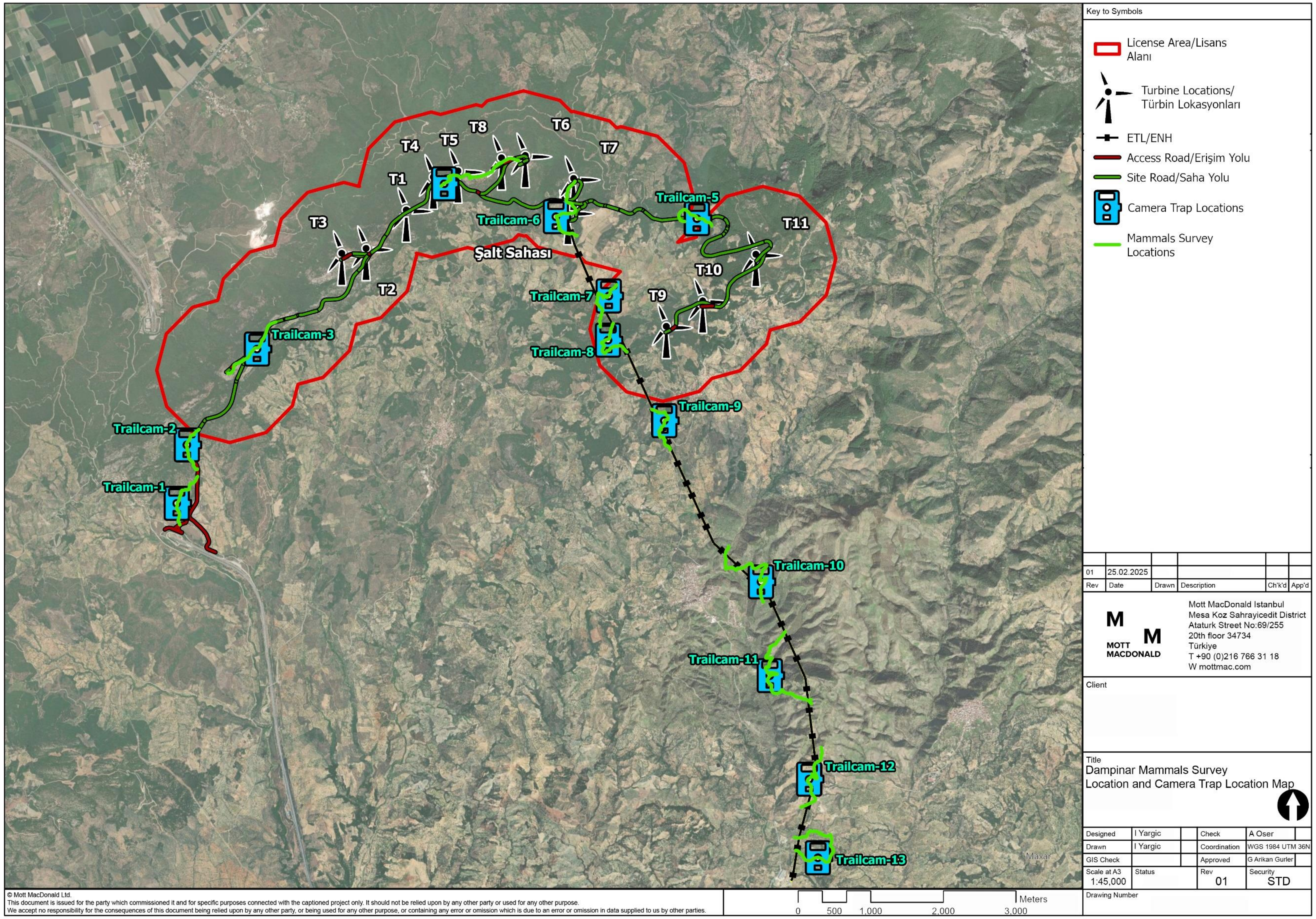

Figure 3-2 Terrestrial Mammal Camera Trap and Transect Survey Locations

3.3 Herpetofauna

3.3.1 Herpetofauna Methodology

In order to reveal the herpetofauna inventory in the study area, the studies were carried out in three steps. These are 1-Desktop studies (Basic Preparation), 2-Field studies, 3-Survey (interview) studies. The herpetofauna studies, as a supplementary component, have been specifically concentrated on the ETL and Access areas, with research efforts focused on identifying suitable locations for sampling points and transects, while turbine locations may be considered but are not the primary focus of the study.

- Station selection and literature review were conducted utilizing GIS.
- As part of the GIS studies, point and transect locations were initially determined using satellite imagery for preliminary preparation.
- Previous herpetofauna studies near the study area were examined within the scope of literature review.
- As part of the field preparation for herpetofauna, satellite maps were initially analysed. Subsequently, fieldwork was conducted to assess the status of the species and their relationship with the habitat. The precise locations of the stations were determined during the fieldwork.
- Information on the distribution of species was obtained from literature reviews and this information was used as a base. The literature sources given in section 6.3 were reviewed.
- The synonyms of the species were also taken into consideration in the literature review.
- Within the scope of literature reviews, nationally protected and internationally recognized areas were investigated and surveyed.

Field Studies:

- Field studies were conducted in areas that were not surveyed previously. The herpetofauna studies, as a supplementary component, have been specifically concentrated on the, ETL and access road area. while turbine locations may be considered but are not the primary focus of the study.
- The first phase of field studies for herpetofauna aimed to assess the suitability of point and transect locations identified in the desktop studies. Stations were relocated, if necessary, with consideration given to natural and semi-natural habitats in and around the Project area.
- In the following studies, habitats suitable for amphibians and reptiles were identified and observations were made for a total of 4 days according to the size of the habitat. Fieldwork started in the morning at daylight and continued until dusk for nocturnal species.
- Observations were conducted at total 17 stations and 17 transects for varying periods of time depending on the size of the habitat.
- In order to identify amphibians and reptiles, water sources, areas close to water sources, under stones and rocks, rock crevices and cracks, tree hollows, etc. were checked in the field work carried out in and around the study area.
- During the observations, 'Visual Encounter Survey (VES)' and Call Survey were used to determine the presence of amphibians and reptile species.

3.3.2 Survey Locations

For the purpose of evaluating herpetofauna diversity within the scope of the Project, the boundaries of the study area were first defined. The study area was determined by considering all components and aspects of the Project, including land preparation, excavation works, installation and construction, transportation, energy production activities, any solid/liquid waste, dust, air emissions, noise, electromagnetic impacts, and the environmental effects and spread distances of any emissions. (See Table 3-3 and Figure 3-3)

Table 3-3 Herpetofauna Survey Locations

Survey Point			Transect			
Station No	Survey Point	Nearest Project Element	Transect No	Transect Start Location	Transect End Location	Nearest Project Element
1	37°57'51.52"N - 27°30'40.20"E	Access Road	1	37°57'48.46"N - 27°30'37.51"E	37°58'7.45"N - 27°30'40.23"E	Access Road
2	37°58'18.34"N - 27°30'43.57"E	Access Road	2	37°58'10.56"N - 27°30'41.35"E	37°58'26.37"N - 27°30'37.35"E	Access Road
3	37°58'34.96"N - 27°30'36.80"E	Access Road	3	37°58'28.98"N - 27°30'43.10"E	37°58'38.44"N - 27°30'41.47"E	Access Road
4	37°58'37.65"N - 27°30'29.99"E	Access Road	4	37°58'35.77"N - 27°30'21.37"E	37°58'31.36"N - 27°30'23.93"E	Access Road
5	37°59'15.97"N - 27°31'15.28"E	Access Road	5	37°59'3.04"N - 27°30'57.83"E	37°59'29.80"N - 27°31'34.32"E	Access Road
6	38° 0'29.71"N - 27°33'16.92"E	Access Road - T4 - T5 - T8 - T6	6	38° 0'26.67"N - 27°32'58.44"E	38° 0'37.29"N - 27°33'50.89"E	Access Road - T4 - T5 - T8 - T6
7	38° 0'15.81"N - 27°34'7.46"E	Access Road - ETL - Switch Yard - T7	7	38° 0'20.02"N - 27°34'4.74"E	37°59'59.79"N - 27°34'14.73"E	Access Road - ETL - Switch Yard - T7
8	37°59'53.26"N - 27°34'6.13"E	ETL	8	37°59'56.56"N - 27°34'5.32"E	37°59'43.99"N - 27°34'22.14"E	ETL
9	37°59'41.26"N - 27°34'36.82"E	ETL	9	37°59'43.41"N - 27°34'33.74"E	37°59'21.79"N - 27°34'36.96"E	ETL
10	37°59'8.20"N - 27°34'48.52"E	ETL	10	37°59'16.78"N - 27°34'44.10"E	37°58'55.33"N - 27°34'54.18"E	ETL
11	37°58'49.84"N - 27°35'1.77"E	ETL	11	37°58'49.84"N - 27°35'1.77"E	37°58'31.11"N - 27°35'3.52"E	ETL
12	37°58'17.71"N - 27°35'32.65"E	ETL	12	37°58'20.67"N - 27°35'19.89"E	37°57'54.88"N - 27°35'23.35"E	ETL
13	37°57'36.79"N - 27°35'35.37"E	ETL	13	37°57'46.42"N - 27°35'32.43"E	37°57'24.52"N - 27°36'3.95"E	ETL
14	37°57'7.85"N - 27°36'16.53"E	ETL	14	37°57'15.93"N - 27°36'19.12"E	37°56'56.35"N - 27°36'17.47"E	ETL
15	37°56'32.35"N - 27°36'20.14"E	ETL	15	37°56'39.28"N - 27°36'22.23"E	37°56'21.53"N - 27°36'25.39"E	ETL
16	37°56'0.35"N - 27°36'33.76"E	ETL	16	37°56'8.47"N - 27°36'28.28"E	37°55'51.04"N - 27°36'28.75"E	ETL
17	37°55'29.95"N - 27°36'25.24"E	ETL	17	37°55'38.60"N - 27°36'17.82"E	37°55'21.58"N - 27°36'16.35"E	ETL

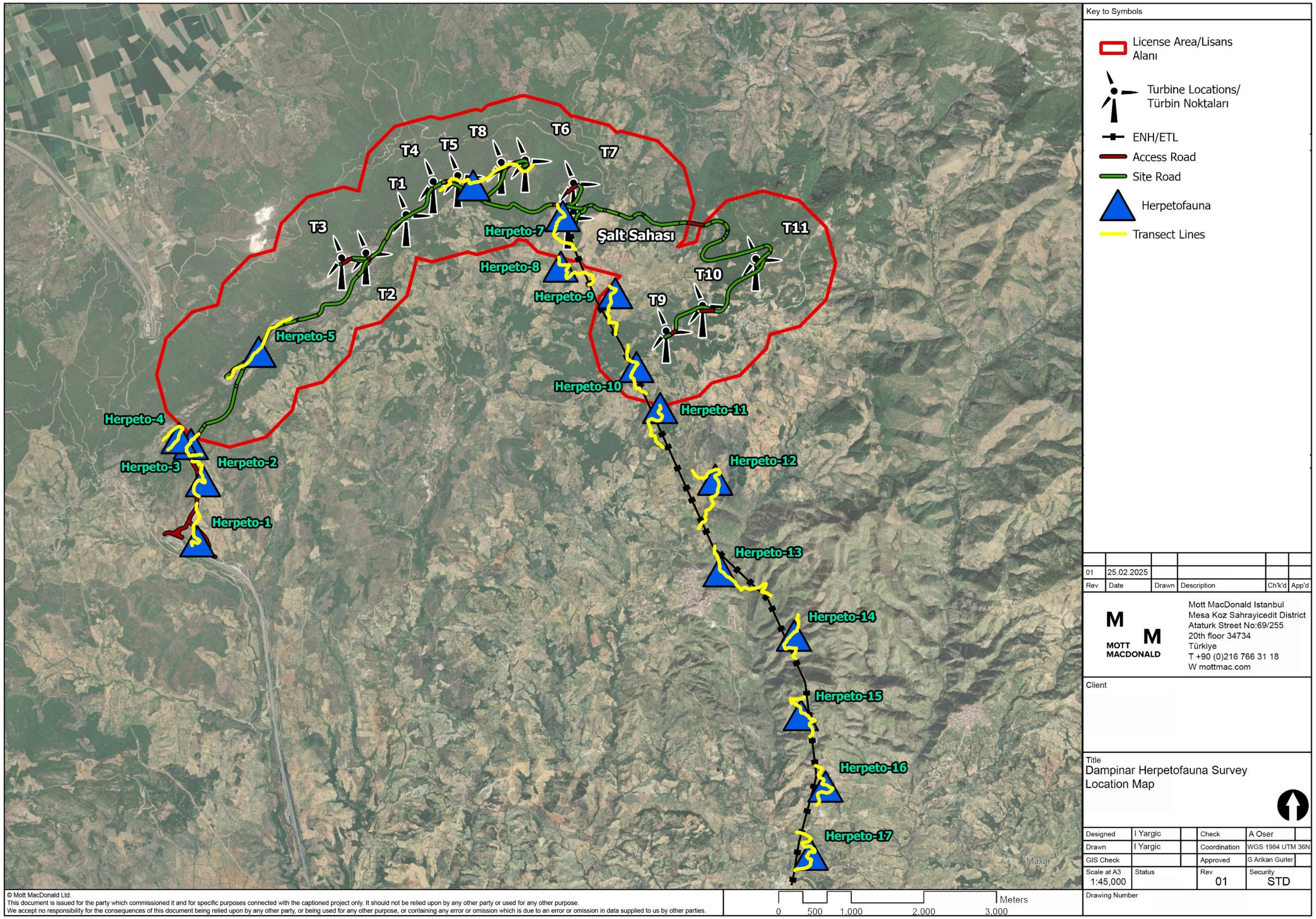

Figure 3-3 Transect and Point Survey Locations of Herpetofauna

3.4 Bird

As previously presented in the standalone methodology reports[2], studies on birds were carried out on 3 main topics: Turbine Vantage Point (VP) survey, ETL VP survey, and Breeding Bird Survey.

No major changes to bird methodology were made. On the other hand, a short summary of minor changes to established methodologies based on field ground truthing are summarised below, and discussed in further detail under Section 3.4.1, 3.4.2 and 3.4.4;

- The turbine layout was changed after the preparation of the methodology document (T1 and T2 locations). The selected VPs cover the new layout sufficiently.
- Since 3 VPs were sufficient to visually cover turbine swept areas well, the easternmost VP was not needed and was not utilized. The remaining VPs were moved 200-500m for improved coverage upon ground truthing. (see Section 3.4.1).
- Similarly, all ETL VPs were revised following ground truthing between 200 m – 700 m and resulted in better coverage than desktop assigned VP ETLs. (see Section 3.4.2)
- VPs were renamed (numeration) for field surveyor convenience (see Section 3.4.1, and Section 3.4.2)
- Spring season for the Project region was considered as extending to mid-June as confirmed by the local ornithology experts. (see Section 3.4.4)

3.4.1 Vantage Point Methodology

Bird survey is based on a vantage point survey, hereafter VP, on high ground methodology both for migratory and breeding/resident species as defined by NatureScot (formerly known as SNH) guidelines, which are widely used for ecological impact assessment studies on wind farms.

VP involves conducting observations from a fixed location, from where the whole project area can be seen and all the birds flying through the wind farm airspace can be detected. A minimum of 36 hours of observations are required for each season.

The appropriate time of observations is determined as when target species are active which is between 09:00 - 17:00, though changing daylight conditions between seasons are also considered when scheduling observations. The observer scans the area within the main viewing angle every 5 minutes, using the maximum angle if a bird contact moves outside of the main angle. When a bird is detected, the species is identified, total number of birds is noted, minimum and maximum flight height during the course is estimated, first and last time of the sighting is noted. A standard field recording sheet was used (see Appendix 6.9).

The observer pays particular attention to the flight height of the birds. The height levels of a wind turbine can be marked as: (a) below rotor height (<42 m), (b) at rotor height (42-180 m), (c) above rotor height (>180 m). When the birds possibly fly near the turbines, the flight line cross the location of the turbine. On maps specifically designed for each VP, the flight path of each bird is drawn.

Vantage Point Field Schedule

During spring of 2024, a total of 128 hours and 7 minutes of surveys were conducted across three vantage points (VP1, VP2, VP3) as presented Table 3-4. Week number of the year are denoted with Monday as first day. The surveys started in mid-April and continued until mid-June. On average, approximately 42 hours and 42 minutes of surveys were conducted per vantage point.

[2] Dampınar WPP Biodiversity Monitoring Methodology. Mott MacDonald. Issue date 28 March 2024.

Table 3-4 VP survey effort and dates in spring.

Week	First Day	VP1	VP2	VP3	Total (h)
W16	15/04	14:14	13:09	12:17	39:40
W20	13/05	16:05	15:03	14:21	45:29
W24	10/06	15:02	14:26	13:30	42:58
Total		45:21	42:38	40:08	128:07

During Summer 2024, a total of 120 hours and 6 minutes of surveys were conducted across three vantage points (VP1, VP2, and VP3) as presented in Table 3-5. Week number of the year are denoted with Monday as first day. The surveys started in mid- June and continued until the end of August e. On average, approximately 40 hours and 2 minutes of surveys were conducted per vantage point.

Table 3-5 VP survey effort and dates in summer.

Week	First Day	VP1	VP2	VP3	Total (h)
W28	08/07	15:23	14:42	13:30	43:35
W32	05/08	16:27	15:23	21:09	52:59
W34	19/08	8:20	7:47	7:25	23:32
Total		40:10	37:52	42:04	120:06

During Autumn 2024, a total of 139 hours and 5 minutes of surveys were conducted across three vantage points (VP1, VP2, and VP3) as presented in Table 3-6. Week number of the year are denoted with Monday as first day. The surveys started in the beginning of September and continued until mid-November. On average, approximately 46 hours and 22 minutes of surveys were conducted per vantage point.

Table 3-6 VP survey effort and dates in autumn.

Week	First Day	VP1	VP2	VP3	Total (h)
W38	16/09	16:15	15:36	14:45	46:36
W40	30/09	8:15	7:20	6:46	22:21
W41	07/10	8:05	7:54	7:35	23:34
W44	28/10	16:17	15:35	14:42	46:34
Total	-	48:52	46:25	43:48	139:05

VP Locations

3 VPs are used for the best visual coverage of the turbine areas. Locations of the VPs are shown on Figure 3-4 and coordinates of the VPs are provided in Table 3-7.

Table 3-7 Locations of the VPs (WGS 84 UTM 35N)

VP	Easting	Northing
VP1	546394	4203785
VP2	548260	4205009
VP3	550520	4205649

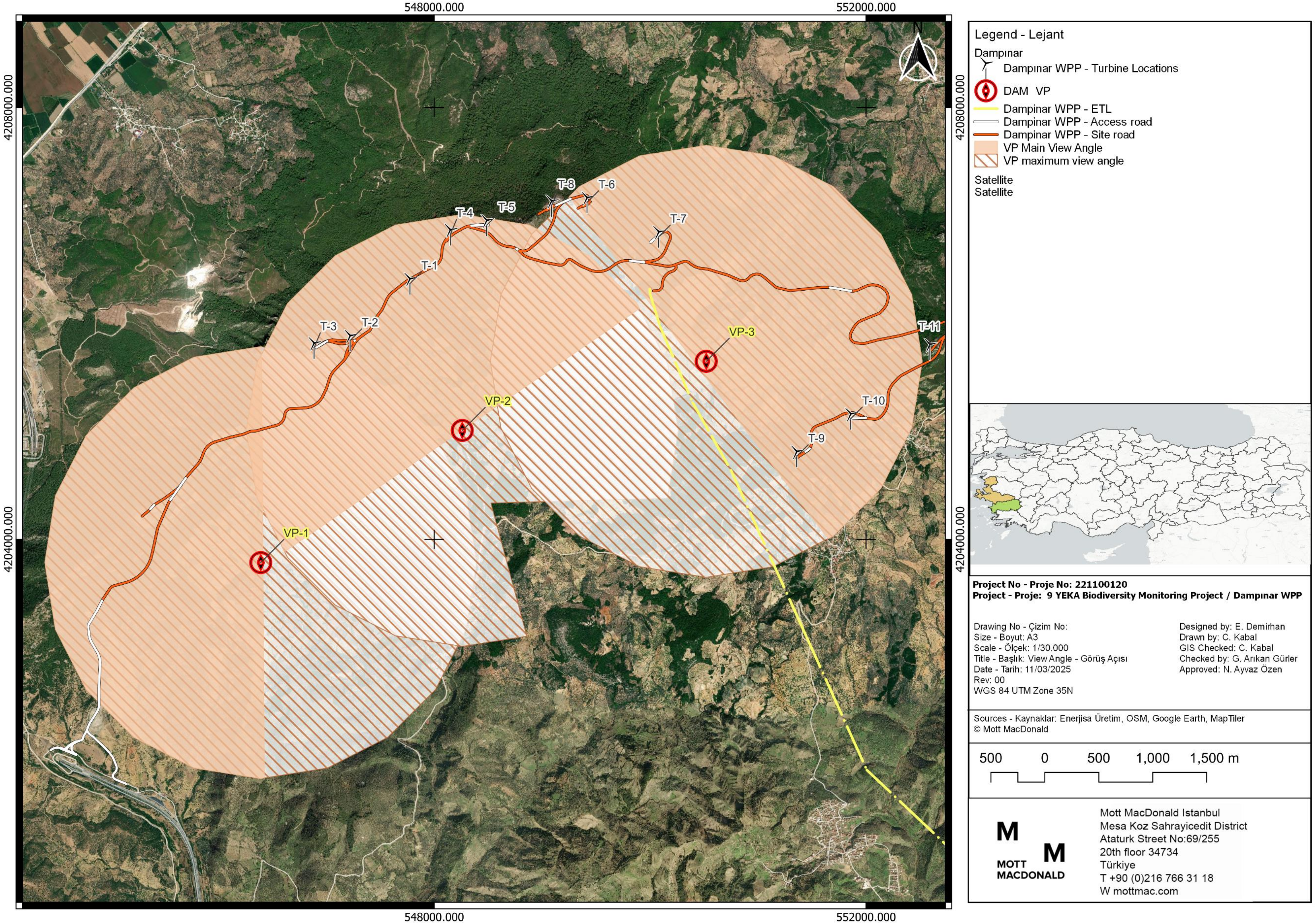

Figure 3-4 Locations of the VPs

3.4.2 ETL Observations

The impact of the wind farm is not complete without considering the related and connected infrastructure. The transmission lines are known to cause death to birds by physical injuries and electrocution. The isolation of the pylons and the installation of the bird diverters are important.

Energy transmission line (ETL) monitoring provides valuable insights into the bird species present at the ETL route and potential environmental considerations related to the observed habitats. In order to assess the potential impact of ETL on the areas it will traverse post-construction, 4 vantage points (VP ETLs) were thoughtfully selected, and observations were conducted at these points. An observer was present at the selected VP ETL and scanned the area each 5 minutes at the maximum possible view angle. When a bird is detected, the species is identified, and the flight height of the bird is recorded as above or below the ETL.

To analyse bird passage rates, the number of bird passages per hour was calculated for each vantage point (TLs) along the ETL. The average passage rate was then determined for three seasons. ETL segments were classified into low, medium, or high-risk categories based on passage rates of target species:

- Low risk: Up to 0.35 bird passages/hour (average value: 0.25 bird passages/hour)
- Medium risk: Between 0.35 and 0.70 bird passages/hour (average value: 0.50 bird passages/hour)
- High risk: Above 0.70 bird passages/hour

These threshold values were established by comparing data from the 9 WPP projects. Current guidelines do not provide explicit thresholds for risk levels; therefore, these classifications were determined based on an arbitrary but consistent decision-making process informed by the comparative dataset.

ETL Observation Field Schedule

Overall, the total survey effort amounted to 159 hours and 30 minutes for the spring period. An average of 39 hr of survey was conducted in spring between 15 April 2024 and 15 June 2024. The surveys were carried out at three transmission line points (VP ETL1, ETL2, ETL3 and ETL4). On average, approximately 42.65 hours of surveys were conducted per VP ETL as shown in Table 3-8.

Table 3-8 ETL survey effort and dates in spring

Week	First Day	VP ETL1	VP ETL2	VP ETL3	VP ETL4	Total
W16	15/04	12:17	14:17	-	15:21	41:55
W20	13/05	14:21	15:04	15:31	16:00	60:56
W24	10/06	13:30	13:46	14:27	14:56	56:39
Total	-	40:08	43:07	29:58	46:17	159:30

A total of 195 hours and 29 minutes of surveys were conducted during the summer of 2024, starting on 15 June , and finishing on 31 August . The surveys were carried out at four transmission line points (VPs ETL1, ETL2, ETL3 and ETL4). On average, approximately 48 hours and 52 minutes of survey was conducted per vantage point (VP ETL) as shown in Table 3-9.

Table 3-9 ETL survey effort and dates in summer

Week	First Day	VP ETL1	VP ETL2	VP ETL3	VP ETL4	Total
W28	08/07	13:30	-	-	-	13:30
W29	15/07	-	15:19	15:41	15:56	46:56
W32	05/08	21:09	22:34	23:19	16:35	83:37
W34	19/08	7:25	-	-	-	7:25
W35	26/08	-	14:07	14:43	15:11	44:01
Total	-	42:04	52:00	53:43	47:42	195:29

A total of 174 hours and 47 minutes of surveys were conducted during the autumn of 2024, starting on 01 September , and finishing on 15 November . The surveys were carried out at four transmission line points (VPs ETL1, ETL2, ETL3 and ETL4). On average, approximately 43 hours and 42 minutes of survey was conducted per vantage point (VP ETL) as shown in Table 3-10.

Table 3-10 ETL survey effort and dates in autumn

Week	First Day	VP ETL1	VP ETL2	VP ETL3	VP ETL4	Total
W38	16/09	14:45	14:19	14:52	15:13	59:09
W40	30/09	6:46	7:38	7:46	8:05	30:15
W41	07/10	7:35	6:07	6:30	6:41	26:53
W44	28/10	14:42	14:05	14:37	15:06	58:30
Total	-	43:48	42:09	43:45	45:05	174:47

ETL Observation Locations

4 ETL VPs are used for the best visual coverage of the turbine areas. Locations of the ETL VPs are shown on Figure 3-5. Coordinates of the ETL VPs are provided in Table 3-11.

Table 3-11 Locations of the VPs (WGS 84 UTM 35N)

VP	Easting	Northing
VP ETL1	550520	4205649
VP ETL2	551505	4203167
VP ETL3	552285	4201268
VP ETL4	552669	4198712

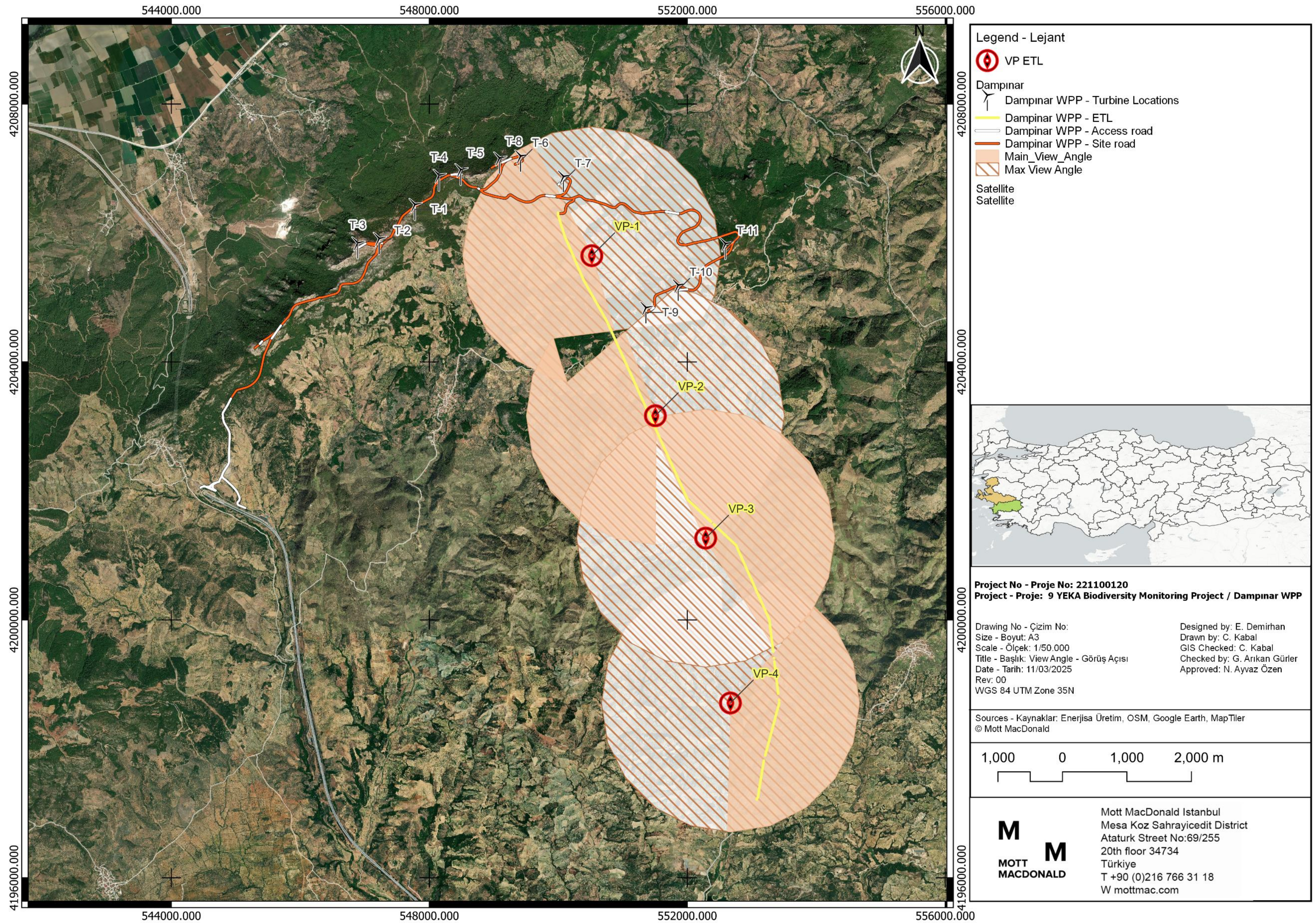

Figure 3-5 Locations of the ETL VPs

3.4.3 Collision Risk Methodology

NatureScot Guidance note describes a methodology for assessing the full impact of wind farms on ornithological interests which includes a two-stage process for the assessment of collision risk (NatureScot 2000). Stage (1) involves the calculation of the number of birds that fly through the rotors, which itself consists of two separate approaches, modified in order to calculate (a) resident bird numbers and (b) migratory bird numbers. Stage (2) involves the calculation of the probability of a bird being hit by a rotor when flying through. Avoidance rates in both approaches are accounted for according to NatureScot (2018), which for raptors is specified as 98% (See Appendix 6.4).

For the purpos)es of this analysis, a resident bird is defined as individuals of either resident species or migrant species that spend more time at the project site than simply passing by. In other words, any bird that spent more time for feeding, resting, hunting was regarded as resident. A migrant bird was defined as birds that only pass through the area once in a certain direction, typically in order to migrate.

Approach 1: Regular Flights through a Wind Farm

The first approach was designed for cases in which a bird population makes regular flights through the wind farm, possibly in a reasonably defined direction. This is usually applied for species that exhibit regular flights between the feeding and sleeping (roosting) areas, such as wintering geese, gulls and cranes.

In this analysis, approach 1 was modified to be applicable to migrant birds. This approach was utilized to estimate the mortality of birds that only fly through and not sleep (roost), feed or exhibit other behaviour that causes the bird to spend time in the area.

Calculation of the collision risk for the birds during regular flights according to NatureScot is:

1. Identify a 'risk window' i.e. a window of width equal to the width of the wind farm across the general flight direction of the birds, and of height equal to the maximum height of the highest turbine. The cross-sectional area W = width x height.
2. Estimate the number of birds flying through this risk window per annum, i.e. flock size x frequency of flight. Make allowance in the flock size for occasions on which birds which may fly higher than this risk window and for the fact that the risk window may only straddle a proportion of the overall flight corridor used by the birds.
3. Calculate the area A presented by the wind farm rotors. Assume the rotors are aligned in the plane of the risk window as, to a first approximation, any reduction in cross-sectional area because the rotors are at an oblique angle is offset by the increased risk to birds which have to make a longer transit through the rotors. Where rotors overlap when viewed in cross-section, allow for the full cross-sectional area of separate rotors as the risk to birds is doubled if passing through two successive rotors: A = N x πR2 where N is the number of rotors and R is the rotor radius
4. Express the total rotor area as a proportion A / W of the risk window.
5. Number of birds passing through rotors = number of birds through risk window x proportion occupied by rotors = n x (A / W)

Approach 2: Birds using the Wind Farm Airspace

The second approach was designed for birds such as raptors which occupy a recognised territory, and there is a certain level of understanding of the likely distribution of flights within that territory.

In this analysis, Approach 2 was adapted to estimate the mortality of resident birds, i.e. birds that spend a certain amount of time hunting, territory defence, displaying and nesting in the area.

Calculation of the collision risk for the birds using the airspace of the wind farm following NatureScot (2000) is:

1. Identify a 'flight risk volume' Vw which is the area of the wind farm multiplied by the height of the turbines.
2. Calculate the combined volume swept out by the wind farm rotors Vr = N x πR2 x (d + l) where N is the number of wind turbines, d is the depth of the rotor back to front, and l is the length of the bird.
3. Estimate the bird occupancy n within the flight risk volume. This is the number of birds present multiplied by the time spent flying in the flight risk volume, within the period (usually one year) for which the collision estimate is being made.

For good results the data available should be based on actual observations within the area of the wind farm alone (provided the observation is done without disturbance), and the best results will be based on observational data about flight heights, such as will enable informed estimate of the proportion of flights at a level which may collide with the wind farm rotors. However, in the absence of such data, an estimate can be made knowing only the number of birds, and proportion of time flying, within the bird's territory, and using some knowledge of flight behaviour to gauge the proportion of flights at a height to be at risk.

4. The bird occupancy of the volume swept by the rotors is then

n x (Vr / Vw) bird-secs.

5. Calculate the time taken for a bird to make a transit through the rotor and completely clear the rotors:

t = (d + l) / v where v m/sec is the speed of the bird through the rotor

6. To calculate the number of bird transits through the rotors, divide the total occupancy of the volume swept by the rotors in bird-secs by the transit time t:

Number of birds passing through rotors = n x (Vr / Vw) / t

3.4.4 Breeding Bird Methodology

In the region, the breeding season for most bird species is between March and July, according to the Turkish Breeding Bird Atlas (which was incorporated into European Breeding Bird Atlas[3]). Breeding bird surveys were conducted for early and late breeding seasons at the Wind Farm. These surveys utilized both line transect (VPs) and points counts (VP ETLs) methods. For the line transect method, transects were selected adjacent to vantage points. Observers walked along these transect lines, recording each potential breeding bird observed, along with the species and the highest level of breeding code for each bird species as given in Table 3-12. For the point count method, observers recorded each potential breeding bird observed at VP and VP ETL points during bird monitoring surveys, along with the species and the highest level of breeding code for each bird species.

[3] https://ebba2.info/

Table 3-12 Breeding bird survey atlas codes.

Breeding categories and Atlas codes
A Possible breeding
1 Species observed in breeding season in possible nesting habitat
2 Singing male(s) present (or breeding calls heard) in breeding season
B Probable breeding
3 Pair observed in suitable nesting habitat in breeding season
4 Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two different days a week or more apart at same place
5 Courtship and display
6 Visiting probable nest site
7 Agitated behaviour or anxiety calls from adults
8 Breed patch on adult examined in the hand
9 Nest building or excavating of nest hole
C Confirmed breeding
10 Distraction display or injury feigning
11 Used nest or eggshells found (occupied or laid within period of survey)
12 Recently fledged young (nidicolous species) or downy young (nidifugous species)
13 Adults entering or leaving nest site in circumstances indicating occupied nest (including high nests or nest holes, the contents of which cannot be seen) or adult seen incubating
14 Adult carrying a faecal sac or food for young
15 Nests containing eggs
16 Nests with young seen or heard

Breeding Bird Field Schedule and Locations

During the breeding bird surveys, a total of 5 transect walks were conducted in April and June (Table 3-13, Figure 3-6). The walks lasted an average of 58.6 minutes and covered 1.2 km. Most walks were conducted at around 09:00 in the morning.

In addition, bird sighting data collated from all VPs and VP ETLs between March and June were used for additional data points on breeding birds.

Table 3-13 Breeding bird survey dates and nearest VPs.

Transect Location	Date	Month	Time	Duration (min)	Distance (km)
DAM-VP1	18/04	Apr	09:06:00	45	1
DAM-VP2	18/04	Apr	09:29:00	60	1
DAM-VP3(TL1)	18/04	Apr	09:40:00	63	1
DAM-TL4	20/04	Apr	08:50:00	60	1
DAM-TL2	20/04	Apr	08:55:00	60	0
DAM-VP1	11/06	Jun	09:01:00	60	1
DAM-VP2	11/06	Jun	09:17:00	60	2
DAM-VP3(TL1)	11/06	Jun	09:30:00	60	1

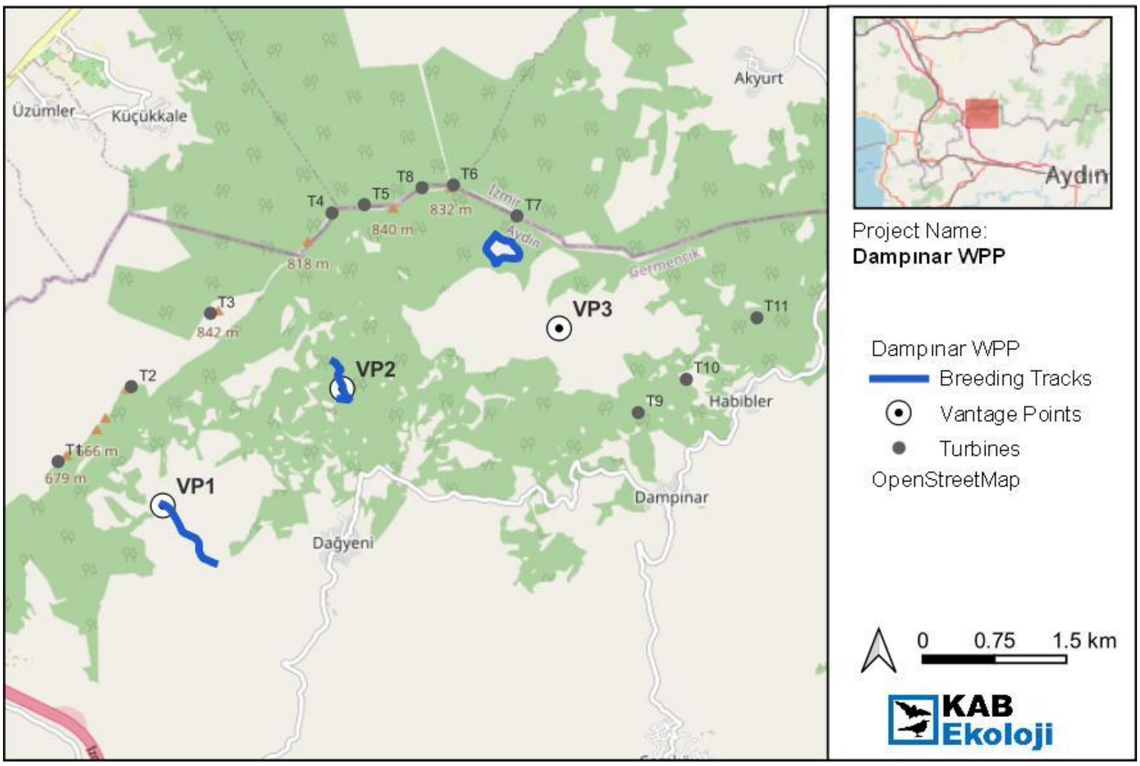

Figure 3-6 Line transects used for breeding surveys at the project site

3.5 Bat

No major changes to the established bat methodology were made. 1 device (Sampling Point 8) was moved 400 m to situate the device better based on ground conditions.

The sources of data loss were due to device failures of unknown causes. Despite device recording failures which were intermittent and unpredictable, enough nights of data were collected for analysis due to NatureScot methodology's high consecutive recording requirements. Detector recording success for spring can be seen in Table 4-40, summer in Table 4-45 and autumn in Table 4-51 . Failures resulted in no recordings and show up as blank in table cells for the device.

3.5.1 Ground Static and Mobile Acoustic Survey Methodology

Ground static bat surveys followed NatureScot guidelines which prescribe the following:

- At sites where the proposed turbine locations are known, static detectors should be placed to provide a representative sample of bat activity at or close to these points.
- Detectors should be placed at all known turbine locations at wind farms containing less than ten proposed turbines.
- Where developments have more than ten turbines, detectors should be placed within the developable area at ten potential turbine locations plus a third of additional potential turbine sites up to a maximum of 40 detectors for the largest developments.
- At key-holed woodland/plantation sites (and other proposals involving extensive habitat alteration), pre-application survey data may not represent the situation post-construction, as the habitat available for bats will change following construction. Automated survey locations should therefore also include open areas including existing nearby rides/clearings in the forestry, to provide an indication of how bats may adapt to and use the new habitat created through turbine construction.

- Ideally, surveys should aim for 10 consecutive nights, but in practice weather conditions may preclude this particularly early or late in the year and in more northerly latitudes.

Static and transect acoustic surveys were conducted in order to assess bat activity in the Project site. For static surveys, 8 full spectrum bat detectors (Wildlife Acoustic Song Meter Mini Bat 2 AA) used at each selected sampling point for ten nights. For transect surveys, surveyors travelled slowly along a designated route within the project site, using a full-spectrum bat detector (Wildlife Acoustics Song Meter Mini Bat 2 AA) to record bat activity. Additionally, geo-tracking was conducted using a mobile phone application (Figure 3-7). Transect surveys were carried out after sundown on the same nights as the static surveys. The detectors were triggered by bat calls. The detectors were located at around 1 m above the ground.

3.5.2 Acoustic Analysis Methodology

Bat recordings obtained from bat detectors were analysed using BatExplorer and Kaleidoscope Pro (produced by Wildlife Acoustics) and species identifications were done by following established scientific literature and industry best practice (Appendix 6.5). Echolocation signal characteristics including signal shape, peak frequency of maximum energy, signal slope, pulse duration, start frequency, end frequency, pulse bandwidth, inter-pulse interval and power spectra are compared to published signal characteristics for local bat species. As the call parameters of some species overlap, in such cases definitive species identification is difficult and their identifications were reported as “possible.” Feeding buzzes and social calls were also noted.

Since Auto-ID yields mixed results in sound identification, i.e. performs very well for some species, or shows biases for some over others, or sometimes identifies species which are not even distributed in a particular region, manual analysis was performed in a sampling type approach in order to account for Auto-ID corrections. For each consecutive ten nights of recording, two nights with the highest number of recordings were identified via filters. These nights were then prioritized for detailed manual analysis. Additionally, it was also ensured that the nights selected represented all the bat species identified through Auto-ID. If the two nights with the highest bat activity did not capture all species for some SPs, additional nights were added into the manual analysis set for a more complete representation.

Myotis genus identifications remain some of the most challenging species to differentiate in Turkiye, and experts are often not comfortable providing species level identifications. A through Myotis analysis is very time intensive, with a small percentage of recordings allowing for further species analysis, and even in that case, most efforts can usually narrow it down to 2-3 species clusters, again not resulting in confident species IDs. If Myotis species IDs are of specific concern, targeted methodologies and approaches would be necessary. Usually for Myotis, a mixture of sound and morphology is preferred for species identification, which in some cases may not even be sufficient, and genetic evidence may be necessary. Bat experts often indicate Myotis at genus level and this has become common practice since Myotis species are not defined in literature or carcass studies as especially collision prone at WPPs.

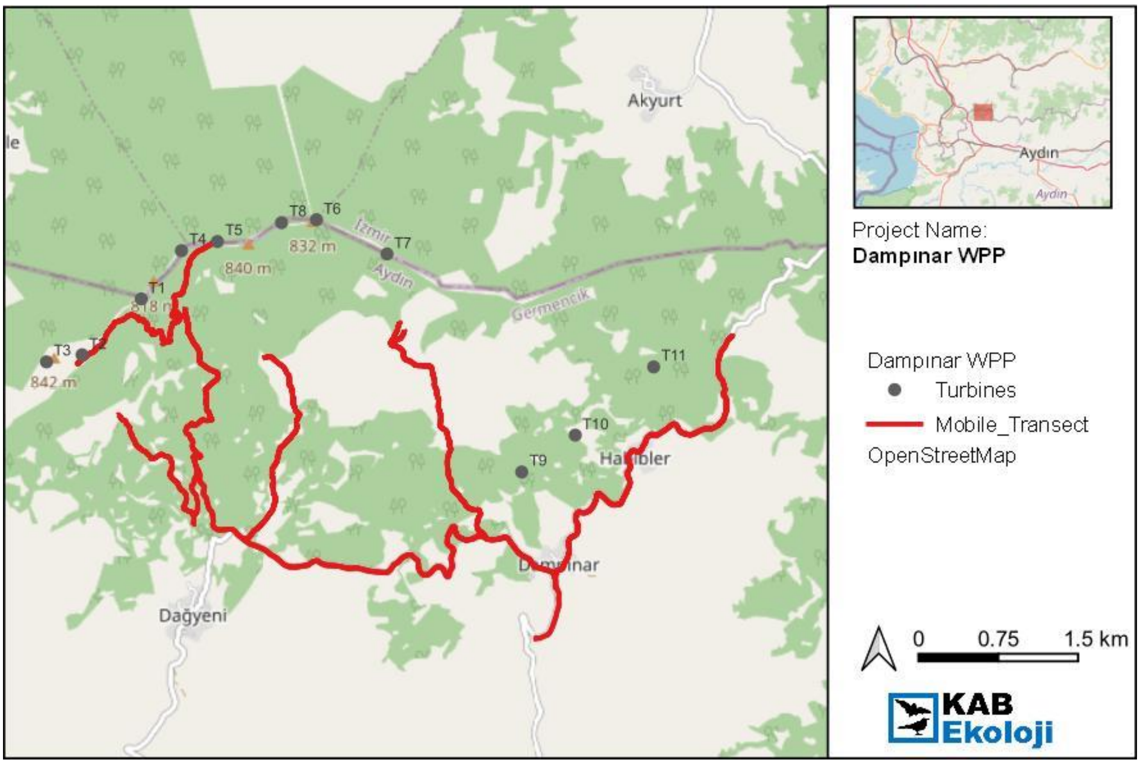

Figure 3-7 Transect survey route at the project.

3.5.3 Field Schedule

A set of static and transect acoustic bat surveys were conducted (Table 3-14). Weather conditions during surveys are given in

Table 3-15.

Table 3-14 Acoustic surveys for 2024 spring, summer, and autumn season.

Survey Season	Start Date	Finish Date	Number of Nights
Spring Static Surveys	20 April	30 April	10 nights
Spring Transect Survey 1	20 April	20 April	1 night
Spring Transect Survey 2	30 April	30 April	1 night
Summer Static Surveys	17 July	27 July	10 nights
Summer Transect Survey 1	20 July	20 July	1 night
Summer Transect Survey 2	27 July	27 July	1 night
Autumn Static Surveys	12 September	22 September	10 nights
Autumn Transect Survey 1	20 September	20 September	1 night
Autumn Transect Survey 2	21 September	21 September	1 night

Table 3-15 Weather conditions during the completed surveys.

Date	Temperature (°C)	Wind Speed (m/s)	Cloud cover %	Precipitation (mm)
2024-04-20	15	4	100	0
2024-04-21	10	1	30	0
2024-04-22	14	3	60	0
2024-04-23	17	2	60	0
2024-04-24	26	7	30	0
2024-04-25	18	2	70	0
2024-04-26	15	3	10	0
2024-04-27	13	1	0	0
2024-04-28	15	1	0	0
2024-04-29	16	2	10	0
2024-04-30	14	2	10	0
2024-07-17	26	1	0	0
2024-07-18	27	1	0	0
2024-07-19	31	3	20	0
2024-07-20	30	4	0	0
2024-07-21	28	1	0	0
2024-07-22	24	1	0	0
2024-07-23	27	1	20	0
2024-07-24	29	2	0	0
2024-07-25	26	2	0	0
2024-07-26	25	2	0	0
2024-07-27	24	4	0	0
2024-07-28	26	4	0	0
2024-09-12	21	2	30	0
2024-09-13	20	1	0	0
2024-09-14	21	2	30	0
2024-09-15	21	2	50	0
2024-09-16	18	1	0	0
2024-09-17	18	1	0	0
2024-09-18	19	1	30	0
2024-09-19	19	1	0	0
2024-09-20	19	1	20	0
2024-09-21	20	2	70	0
2024-09-22	18	2	0	0
2024-09-23	19	2	0	0

3.5.4 Survey Locations

Ground static bat detector locations (Sampling Point, SP) are provided in Table 3-16 and shown on Figure 3-8.

The locations of the bat detectors are not very ideal due to lack of access to the turbine areas during the early stages of the baseline collection since construction for site roads had not begun at the time of ground acoustic surveys mobilization. Turbines were mapped to nearest available representative habitats as agreed upon during methodology drafting stage, but these are lower in elevation and not so much located within forest interior as in the future turbine clearings. SPs will be moved to their respective nearest turbines as roads become available, and as such SP9 and SP10 were later added as access became available. Since the number of available nearest representative accessible habitats were limited, 8 SPs were selected. This is less than NatureScot prescription, but more than the minimum acceptable prescription of EUROBATS.

The turbine layout was changed after the preparation of the methodology document (T1 and T2 locations). Since the selected SPs are not at exact turbine locations and sample nearest available habitats, SP selection is still as viable as before, however SP6 might be considered redundant. SP09 and SP10 were added after roads became accessible for turbine zero locations and SP06 was removed in autumn.

Table 3-16 Ground static bat detector locations (WGS84 UTM35N).

SP	Easting	Northing	Turbine (new layout)
SP1	552979	4205342	T11
SP2	552229	4204476	T10
SP3	550745	4204269	T9
SP4	548407	4205521	T1
SP5	547712	4204994	T3, T2
SP6	546114	4204368	T2, T3
SP7	549084	4205770	T8, T6
SP8	550052	4205976	T7
SP09	548461	4206901	T5
SP10	547206	4205777	T2, T3

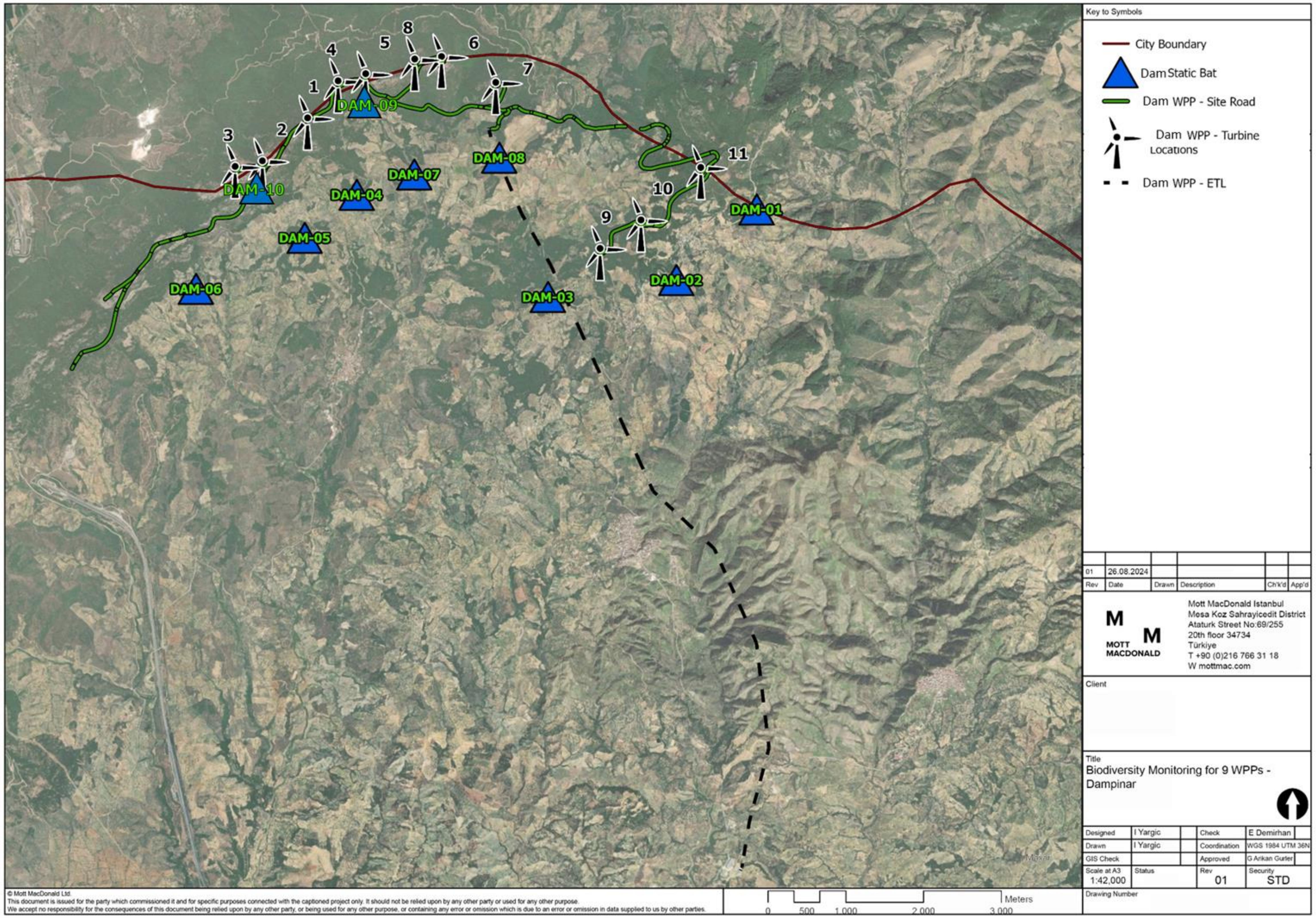

Figure 3-8 Ground static bat detector locations

4 Results

4.1 Flora

4.1.1 Lesser Menderes Delta and Mahal Hills Key Biodiversity Area

Dampınar WPP, including its components such as the ETL and access roads, is not located within a legally protected or internationally recognised area. The closest Key Biodiversity Area (KBA) is Lesser Menderes Delta KBA[4], which is within 7,5 km of the access road and no overlap with the Area of Influence (AoI) of the Project. Other closest KBA is Mahal Hills KBA[5] which is within 8 km of the access road and no overlap with the Area of Influence of the Project. KBAs are internationally recognised areas that currently do not have legal protection in Türkiye but are widely used for various conservation aims.

According to the Mahal Hills KBA database, no plant species with KBA triggers are present in the area. Table 4-1 lists the plant species identified within the Lesser Menderes Delta KBA. During the field survey conducted within the Project area KBA associated flora species not observed.

Table 4-1 KBA Flora Species

Family	Species	Observation Status
ASPARAGACEAE	*Arum balansanum R.R.Mill*	Not observed

4.1.2 Habitat Types

The classification of habitat types within terrestrial and freshwater ecosystems was carried out using the European Nature Information System (EUNIS) 2012 Habitat Classification.

The recorded habitats are listed in the Table 4-2 below and shown in Figure 4-1, along with their wide distribution areas within the study area. The amount of habitat lost due to site roads, turbine footprints and switchyard area are given in Table 4-3 through Table 4-7.

Table 4-2 Habitat Types of the Project AoI

Broad habitat type	EUNIS Habitat Type	Extend within Project Footprint (ha)	Percentage
Woodland	G1.7 Thermophilus deciduous woodland	428.7	4.7%
	G3.5 Pinus nigra woodland	470.5	5.2%
	G4.B Mixed mediterranean pine - thermophilous oak woodland	58.1	0.6%
	G4.D Mixed Black pine (Pinus nigra) - evergreen oak woodland	10.6	0.1%
	G4.E Mixed mediterranean pine - evergreen oak woodland	1035.8	11.4%
Agricultural Fields	I1.1 Intensive unmixed crops	4507.8	49.5%
	I1.2 Mixed crops of market gardens and horticulture	2405.1	26.4%
Constructed, industrial and other artificial habitats	J1.2 Residential buildings of villages and urban peripheries	92.2	1.0%
	J4.2 Road networks	60.5	0.7%
	J5.3 Highly artificial non-saline standing waters	28.2	0.3%
Total		9097.5	100.0%

[4] https://www.keybiodiversityareas.org/site/factsheet/761

[5] https://www.keybiodiversityareas.org/site/factsheet/45644

Table 4-3 Habitat Loss on Access Roads

EUNIS	Area (ha)	Percentage
G1.7 Thermophilus deciduous woodland	0.3	0.1%
G3.5 Pinus nigra woodland	0.0	0.0%
G4.D Mixed Black pine (Pinus nigra) - evergreen oak woodland	0.2	2.1%
G4.E Mixed mediterranean pine - evergreen oak woodland	0.5	0.1%
I1.1 Intensive unmixed crops	2.5	0.1%
I1.2 Mixed crops of market gardens and horticulture	1.4	0.1%
J4.2 Road networks	0.2	0.4%
Total	5.2	

Table 4-4 Habitat Loss on Site Roads

EUNIS	Area (ha)	Percentage
G1.7 Thermophilus deciduous woodland	1.5	0.3%
G3.5 Pinus nigra woodland	1.3	0.3%
G4.D Mixed Black pine (Pinus nigra) - evergreen oak woodland	0.4	4.1%
G4.E Mixed mediterranean pine - evergreen oak woodland	4.7	0.5%
I1.1 Intensive unmixed crops	5.3	0.1%
I1.2 Mixed crops of market gardens and horticulture	6.0	0.2%
J4.2 Road networks	0.0	0.0%
Total	19.2	

Table 4-5 Habitat Loss on Turbine Footprint

EUNIS	Area (ha)	Percentage
G1.7 Thermophilus deciduous woodland	0.0	0.0%
G3.5 Pinus nigra woodland	0.0	0.0%
G4.D Mixed Black pine (Pinus nigra) - evergreen oak woodland	1.2	11.1%
G4.E Mixed mediterranean pine - evergreen oak woodland	8.7	0.8%
I1.1 Intensive unmixed crops	3.6	0.1%
I1.2 Mixed crops of market gardens and horticulture	3.2	0.1%
J4.2 Road networks	0.0	0.0%
Total	16.7	

Table 4-6 Habitat Loss on Switchyard Area

EUNIS	Area	Percentage
G1.7 Thermophilus deciduous woodland	1.3	0.3%
G3.5 Pinus nigra woodland	0.0	0.0%
G4.D Mixed Black pine (Pinus nigra) - evergreen oak woodland	0.0	0.0%
G4.E Mixed mediterranean pine - evergreen oak woodland	0.0	0.0%
I1.1 Intensive unmixed crops	0.0	0.0%
I1.2 Mixed crops of market gardens and horticulture	0.0	0.0%
J4.2 Road networks	0.0	0.0%
Total	1.3	

Table 4-7 Habitat Loss on ETL

EUNIS	Area (ha)	Percentage
G1.7 Thermophilus deciduous woodland	0.9	0.2%
G3.5 Pinus nigra woodland	0.0	0.0%
G4.D Mixed Black pine (Pinus nigra) - evergreen oak woodland	0.0	0.0%
G4.E Mixed mediterranean pine - evergreen oak woodland	5.0	0.5%
I1.1 Intensive unmixed crops	44.9	1.0%
I1.2 Mixed crops of market gardens and horticulture	9.7	0.4%
J4.2 Road networks	0.0	0.0%
Total	60.5	

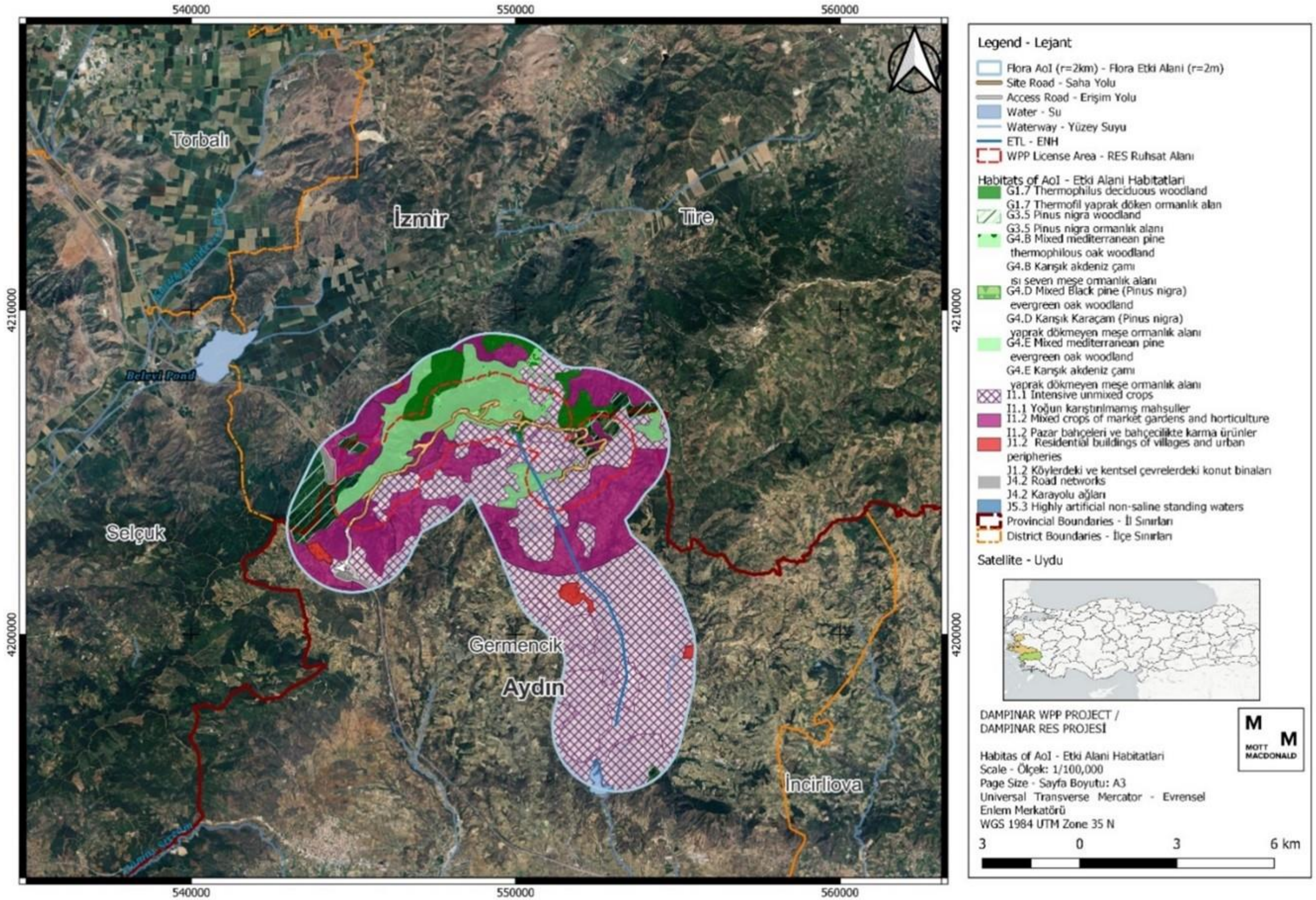

Figure 4-1 EUNIS Habitat Classification of Dampınar WPP Area of Influence

4.1.3 Floristic Analyses

As a result of the field studies, 170 plant taxa at the species and subspecies level from 35 families were identified in the Project area. The list of the plant taxa identified in the Project area and its surroundings is provided in Table 4-8.

Table 4-8 Plant Taxa and Threatened Categories Identified in the Project Area of Influence

Family	No	Species	Phytogeographic Region	Endemism		TRDB	Bern	CITES			Habitat							Relative Abundance				
				R	W		App 1	App 1	App 2	App 3	1	2	3	4	5	6	7	1	2	3	4	5
ACANTHACEAE	1	*Acanthus hirsutus Boiss*									X				X	X		X				
ANACARDIACEA	2	*Pistacia lentiscus L.*														X			X			
ASPLENIACEAE	3	*Asplenium trichomanes L*													X	X			X			
	4	*Asplenium ceterach L*														X			X			
ARISTOLOCHIACEAE	5	*Aristolochia parvifolia Sibth. & Sm.*	Mediterranean												X	X			X			
ASPARAGACEAE	6	*Asparagus officinalis L.*														X		X				
	7	*Muscari neglectum Guss. ex Ten.*													X	X			X			
	8	*Ruscus aculeatus L.*									X				X	X			X			
ASTERACEAE	9	*Anthemis aciphylla Boiss.*														X			X			
	10	*Anthemis cretica L.*													X	X			X			
	11	*Anthemis pauciloba Boiss.*														X			X			
	12	*Bellis annua L.*									X					X			X			
	13	*Carduus nutans L.*													X	X			X			
	14	*Carlina vulgaris L.*														X			X			
	15	*Centaurea hierapolitana Boiss.*														X			X			
	16	*Centaurea iberica Trev. ex Spreng.*									X				X	X				X		
	17	*Centaurea virgata Lam.*	Irano-Turanian													X			X			
	18	*Cnicus benedictus L.*	Widespread								X					X			X			
	19	*Centaurea cadmea Boiss.*													X	X			X			
	20	*Cota tinctoria (L.) J.Gay*	Widespread												X	X			X			
	21	*Crepis sancta (L.) Bornm.*									X				X	X		X				
	22	*Doronicum orientale Hoffm.*													X	X			X			
	23	*Senecio vernalis Waldst. & Kit.*													X	X			X			
BORAGINACEAE	24	*Alkanna tinctoria (L.) Tausch*									X					X			X			
BRASSICACEAE	25	*Alyssum murale Waldst. & Kit.*														X			X			
	26	*Arabis alpina subsp. alpina L.*													X	X			X			
	27	*Aubrieta canescens (Boiss.) Bornm.*														X			X			
	28	*Aurinia rupestris (Sweet) Cullen & T.R.Dudley*														X				X		
	29	*Draba bruniifolia Steven*									X				X	X				X		
	30	*Draba verna L.*													X	X			X			
	31	*Fibigia macrocarpa (Boiss.) Boiss.*									X					X			X			
	32	*Microthlaspi perfoliatum (L.) F.K.Mey.*	Widespread								X				X	X			X			

Family	No	Species	Phytogeographic Region	Endemism		TRDB	Bern	CITES			Habitat							Relative Abundance				
				R	W		App 1	App 1	App 2	App 3	1	2	3	4	5	6	7	1	2	3	4	5
CAMPANULACEAE	33	*Asyneuma limoniifolium (L.) Janch.*									X				X	X			X			
	34	*Campanula olympica Boiss.*														X			X			
	35	*Campanula pamphylica (Contandr., Quézel & Pamukç.) Akçiçek & Vural*													X	X			X			
	36	*Legousia pentagonia (L.) Thell.*													X	X			X	X		
CISTACEAE	37	*Cistus creticus L.*									X				X	X			X			
	38	*Cistus laurifolius L.*	Widespread												X	X			X			
CUPRESSACEAE	39	*Juniperus communis L*													X	X						
	40	*Juniperus excelsa M.Bieb.*													X	X				X		
	41	*Juniperus oxycedrus L.*														X			X			
ELAEAGNACEAE	42	*Elaeagnus angustifolia L.*														X			X			
FABACEAE	43	*Anthyllis vulneraria L.*													X	X			X			
	44	*Astragalus angustiflorus subsp. angustiflorus K.Koch*	Irano-Turanian												X	X			X			
	45	*Astragalus depressus var. depressus L.*													X	X			X			
	46	*Astragalus elongatus subsp. elongatus Willd.*	Irano-Turanian													X			X			
	47	*Astragalus glycyphyllos L.*	Euro-Siberia													X			X			
	48	*Astragalus hamosus L.*									X				X	X			X			
	49	*Astragalus microcephalus Willd*														X				X		
	50	*Astragalus pinetorum Boiss.*	Irano-Turanian													X				X		
	51	*Astragalus prusianus Boiss.*	Mediterranean								X				X	X				X		
	52	*Astragalus stella L.*	Mediterranean													X		X				
	53	*Astragalus wiedemannianus F.B.Fisch.*	Irano-Turanian												X	X			X			
	54	*Biserrula pelecinus L.*	Mediterranean												X	X			X			
	55	*Colutea cilicica Boiss. & Balansa*														X			X			
	56	*Coronilla coronata L.*	Mediterranean													X			X			
	57	*Cytisus hirsutus L.*													X	X			X			
	58	*Galega officinalis L.*	Euro-Siberia								X				X	X			X			
	59	*Genista januensis subsp. lydia (Boiss.) Kit Tan & Ziel.*	Mediterranean													X			X			
	60	*Gonocytisus angulatus Spach*	Mediterranean												X	X				X		
	61	*Lathyrus aphaca var. aphaca L.*	Mediterranean													X				X		
	62	*Lathyrus aureus (Steven) D.Brandza*	Mediterranean								X				X	X			X			
	63	*Lathyrus cicera L.*	Widespread													X			X			
	64	*Lathyrus digitatus (M.Bieb.) Fiori*	Mediterranean												X	X			X			

Family	No	Species	Phytogeographic Region	Endemism		TRDB	Bern	CITES			Habitat							Relative Abundance				
				R	W		App 1	App 1	App 2	App 3	1	2	3	4	5	6	7	1	2	3	4	5
	65	*Lotus corniculatus L.*													X	X		X				
	66	*Medicago lupulina L.*	Widespread								X					X			X			
	67	*Medicago sativa L.*	Widespread												X	X			X			
	68	*Onobrychis caput-galli (L.) Lam.*	Mediterranean								X					X			X			
	69	*Onobrychis oxyodonta var. armena (Boiss. & Huet) Aktoklu*														X			X			
	70	*Ononis reclinata L.*	Mediterranean												X	X		X				
	71	*Ononis spinosa subsp. antiquorum (L.) Briq.*	Mediterranean								X					X			X			
	72	*Securigera varia (L.) Lassen*	Mediterranean													X		X				
	73	*Scorpiurus subvillosus var. subvillosus L.*													X	X			X			
	74	*Spartium junceum L.*	Mediterranean								X					X			X			
	75	*Trifolium hybridum L.*	Widespread													X			X			
	76	*Trifolium mesogitanum Boiss.*	Mediterranean												X	X			X			
	77	*Trifolium repens var. repens L.*	Widespread												X	X			X			
	78	*Trifolium resupinatum var. resupinatum L.*	Widespread												X	X		X				
	79	*Vicia cracca L.*	Widespread								X				X	X		X				
	80	*Vicia ervilia (L.) Willd.*													X	X			X			
	81	*Vicia villosa subsp. villosa Roth*									X					X			X			
	82	*Quercus coccifera L.*	Mediterranean								X					X			X			
JUGLANDACEAE	83	*Juglans regia L.*	Widespread								X				X	X				X		
LAMIACEAE	84	*Ajuga chamaepitys (L.) Schreb.*	Widespread													X			X			
	85	*Nepeta nuda L.*	Widespread													X			X			
	86	*Lamium amplexicaule L.*													X	X			X			
	87	*Lamium garganicum L.*	Widespread								X				X	X			X			
	88	*Lamium orientale (Fisch. & C.A.Mey.) E.H.L.Krause*	Irano-Turanian													X			X			
	89	*Lavandula stoechas subsp. stoechas L.*	Mediterranean												X	X			X			
	90	*Marrubium vulgare L.*	Mediterranean												X	X			X			
	91	*Phlomis grandiflora H.S.Thompson*	Widespread													X			X			
	92	*Phlomis pungens Willd.*	Widespread												X	X			X			
	93	*Phlomis samia L.*	Mediterranean												X	X			X			
	94	*Salvia aethiopis L.*													X	X				X		
	95	*Salvia bracteata Banks & Sol.*													X	X				X		
	96	*Salvia tomentosa Mill.*	Irano-Turanian												X	X			X			
	97	*Teucrium chamaedrys L.*	Mediterranean												X	X			X			

Family	No	Species	Phytogeographic Region	Endemism		TRDB	Bern	CITES			Habitat							Relative Abundance				
				R	W		App 1	App 1	App 2	App 3	1	2	3	4	5	6	7	1	2	3	4	5
	98	*Teucrium orientale L.*									X					X		X				
	99	*Teucrium polium L.*	Widespread													X			X			
	100	*Thymus cherlerioides Vis.*	Mediterranean												X	X			X			
	101	*Thymus sipyleus Boiss.*													X	X				X		
	102	*Scutellaria brevibracteata subsp. subvelutina (Rech.f.) Greuter & Burdet*	Mediterranean												X	X			X			
	103	***Scutellaria orientalis subsp. carica J.R.Edm***	**Mediterranean**	**X**		**EN**										X			X			
	104	*Scutellaria orientalis subsp. pinnatifida J.R.Edm.*														X			X			
	105	*Stachys cretica L.*													X	X			X			
MORACEAE	106	*Ficus carica subsp. carica L.*	Mediterranean								X					X			X			
	107	*Morus alba L.*	Widespread													X			X			
OLEACEAE	108	*Jasminum officinale L.*													X	X			X			
	109	*Olea europaea L.*														X			X			
PAPAVERACEAE	110	*Papaver rhoeas L.*													X	X			X			
PINACEAE	111	*Cedrus libani A.Rich*													X	X		X				
	112	*Pinus brutia Ten.*														X				X		
	113	*Pinus nigra subsp. pallasiana var. pallasiana*									X					X			X			
PLANTAGINACEAE	114	*Plantago major L.*													X	X				X		
	115	*Plantago lagopus L.*	Mediterranean												X	X		X				
	116	*Plantago lanceolata L.*	Widespread												X	X					X	
PLATANACEAE	117	*Platanus orientalis L.*	Widespread								X				X	X		X				
PLUMBAGINACEAE	118	*Acantholimon acerosum (Willd.) Boiss.*	Widespread												X	X			X			
	119	*Plumbago europaea L.*	Euro-Siberia													X			X			
POACEAE	120	*Aegilops caudata L.*	Mediterranean												X	X			X			
	121	*Alopecurus arundinaceus Poir.*	Euro-Siberia								X				X	X			X			
	122	*Avena sativa L.*														X			X			
	123	*Arrhenatherum palaestinum Boiss.*	Mediterranean								X					X			X			
	124	*Brachypodium sylvaticum (Huds.) P.Beauv.*	Euro-Siberia													X				X		
	125	*Bromus squarrosus L.*													X	X				X		
	126	*Bromus sterilis L.*									X				X	X			X			
	127	*Bromus tectorum L.*	Widespread												X	X			X			
	128	*Dactylis glomerata L.*														X		X				
	129	*Eragrostis minor Host*									X				X	X			X			
	130	*Festuca callieri subsp. callieri*														X			X			

Family	No	Species	Phytogeographic Region	Endemism		TRDB	Bern	CITES			Habitat							Relative Abundance				
				R	W		App 1	App 1	App 2	App 3	1	2	3	4	5	6	7	1	2	3	4	5
	131	*Festuca pinifolia (Hack. ex Boiss.) Bornm.*	Mediterranean								X				X	X			X			
	132	*Festuca valesiaca Schleich. ex Gaudin*													X	X			X			
	133	*Hordeum bulbosum L.*													X	X			X			
	134	*Koeleria pyramidata (Lam.) P. Beauv.*	Euro-Siberia								X				X	X			X			
	135	*Phleum phleoides (L.) H. Karst.*	Euro-Siberia													X			X			
	136	*Poa annua L.*									X					X			X			
	137	*Poa angustifolia L.*	Widespread								X					X			X			
	138	*Poa bulbosa L.*	Mediterranean								X				X	X			X			
	139	*Polypogon viridis (Gouan) Breistr.*	Euro-Siberia												X	X				X		
	140	*Secale cereale L.*													X	X				X		
	141	*Stipa holosericea Trin.*	Irano-Turanian								X				X	X					X	
	142	*Triticum aestivum L.*	Widespread								X				X	X			X			
POLYGONACEAE	143	*Rumex scutatus L.*	Widespread													X			X			
PRIMULACEAE	**144**	***Cyclamen hederifolium Aiton***				**VU**			**X**							X			X			
PTERIDACEAE	145	*Adiantum capillus-veneris L.*													X	X			X			
RANUNCULACEAE	146	*Adonis aestivalis L.*														X			X			
	147	*Ranunculus ficaria L.*														X			X			
ROSACEAE	148	*Amygdalus orientalis Mill.*													X	X			X			
	149	*Crataegus orientalis Pall. ex M.Bieb.*									D				X	X		X				
	150	*Sanguisorba minor L.*														X			X			
	151	*Rosa canina L.*													X	X			X			
	152	*Rosa pulverulenta M.Bieb.*													X	X			X			
	153	*Potentilla recta L.*									X					X			X			
	154	*Prunus x domestica L.*													X	X			X			
	155	*Pyrus elaeagnifolia Pall.*									X				X	X			X			
	156	*Asperula arvensis L.*	Widespread												X	X			X			
RUBIACEAE	157	*Asperula lilaciflora Boiss.*									X				X	X			X			
	158	*Cruciata taurica (Pall. ex Willd.) Ehrend.*	Irano-Turanian												X	X			X			
	159	*Galium rivale (Sibth. & Sm.) Griseb.*	Euro-Siberia												X	X					X	
	160	*Galium verum L.*	Widespread													X			X			
	161	*Plocama calabrica (L.f.) M.Backlund & Thulin*	Mediterranean												X	X			X			
	162	*Sherardia arvensis L.*	Mediterranean								X					X			X			
SALICACEAE	163	*Populus alba L.*													X	X			X			

Family	No	Species	Phytogeographic Region	Endemism		TRDB	Bern	CITES			Habitat							Relative Abundance				
				R	W		App 1	App 1	App 2	App 3	1	2	3	4	5	6	7	1	2	3	4	5
SANTALACEAE	164	*Viscum album L.*														X			X			
STYRACACEAE	165	*Styrax officinalis L.*									X				X	X			X			
THYMELAEACEAE	166	*Daphne oleoides Schreb.*														X			X			
URTICACEAE	167	*Parietaria judaica L.*	Widespread												X	X			X			
	168	*Urtica dioica L.*	Widespread								X					X			X			
VIOLACEAE	169	*Viola kitaibeliana Roem. & Schult.*													X	X			X			
	170	*Viola parvula Tineo*									X				X	X		X				

Relative abundance: 1: Very Rare, 2: Rare, 3: Moderately Abundant 4: Abundant 5: Very Abundant

Endemism: R: Regional **W**: Widespread

TRDB: Turkish Red Data Book: Cr: Critically Endangered, En: Endangered, VU: Vulnerable, NT: Near Threatened, LC: Least Concern

Habitat Classification:

1: G1.7: Thermophilus deciduous woodland

2: G3.5: Pinus nigra woodland

3: G4.B: Mixed mediterranean pine - thermophilous oak woodland

4: G4.D: Mixed Black pine (Pinus nigra) - evergreen oak woodland

5: G4.E: Mixed mediterranean pine - evergreen oak woodland

6: I1.1: Intensive unmixed crops

7: I1.2: Mixed crops of market gardens and horticulture

4.1.4 Status of Plants in Terms of Threatened Category and Endemism

As a result of the field study, a total of 1 regional endemic (*Scutellaria orientalis* subsp*. carica*) and 1 rare distribution but not endemic (*Cyclamen hederifolium)* plant species were identified. There is no data different from which was identified in the local EIA process for the ETL and access road. (See Table 4-9)

Scutellaria orientalis subsp*. carica* is a regional endemic plant species, occurring in the provinces of Aydın within Türkiye. The species is classified under the TRDB Threatened category as "EN: Endangered."

Cyclamen hederifolium is a rare distribution but not endemic plant species, occurring in the provinces of Çanakkale, İzmir, Muğla and İstanbul within Türkiye. As the population status within its distribution areas remains relatively stable, the species is classified under the TRDB Threatened category as "VU: Vulnerable." *Cyclamen hederifolium* is also listed in CITES Annex II.

The target plant species were documented in previous studies conducted within EIA Report. However, no direct observations were recorded during the subsequent field studies. Due to habitat similarities, their presence in the access road and ETL areas is also considered likely, despite the absence of direct observations.

Table 4-9 The endemic species in the Project area of Influence

Taxon	TRDB	Observation Status
	Regional Endemic Species	
Scutellaria orientalis subsp*. carica*	EN	Not Observed
	Non-Endemic Rare Species	
Cyclamen hederifolium	VU	Observed

4.2 Terrestrial Mammal

4.2.1 Lesser Menderes Delta and Mahal Hills Key Biodiversity Area

The KBA (Key Biodiversity Area) report for the Mahal Hills, along with the online databases and resources reviewed, does not provide specific information regarding the presence of terrestiral mammal species relevant to the KBA in the region.

According to the Lesser Menderes Delta database[6], there is one terrestrial mammal species within the area that does not trigger KBA criteria (See Table 4-10)

Mouse-tailed dormouse (*Myomimus roachi*) (VU) was not observed in the field, it was identified as a species which would use the habitat at the Project area (especially the old trees) by the local mammal expert, and it has been recorded as literature data.

Table 4-10 Other species not triggering KBA criteria

Family	Species	English Name	Observation Status
GLIRIDAE	*Myomimus roachi*	Roach's Mouse-tailed Dormouse	Not observed

[6] https://www.keybiodiversityareas.org/site/factsheet/761

4.2.2 Terrestrial Mammal Surveys

The similar data as provided in the ESIA regarding terrestrial mammals has been obtained. A total of 30 mammal species from 14 families were identified within the Project Area of Influence through a combination of field studies, and literature reviews. Among these species, 11 were directly observed during fieldwork, and 21 were identified through a review of existing literature (Table 4-11). There is no endemic mammal species among the identified species.

Among the mammal species identified in the Project Area of Influence, 5 species are listed in Annex II, 11 species in Annex III of the Bern Convention. 3 species in Annex III, 1 Species Annex I and 2 Species Annex II of CITES. According to the IUCN Red List, no species in the area is classified as endangered, with 2 species categorized as Vulnerable (VU) and 1 species categorized as Near Threatened (NT). The remaining species are classified as Least Concern (LC), indicating they are not currently at significant risk of extinction.

Roe deer (*Capreolus capreolus)* (LC)*,* which is distributed in very few places in the Mediterranean and Aegean Regio. It has been recorded as literature data in field and survey studies. Although its status is Least Concern, this species is considered to have national importance.

Marbled polecat (*Vormela peregusna*) is Vulnerable (VU). Its habitat preference (open land, arid, steppe areas) does not majorly overlap with the habitat characteristics of the Project area (forest and forest clearings) but it could be a rare occurrence here. Marbled polecat has been recorded as literature data.

Anatolian Ground Squirrel (*Spermophilus xanthoprymnus*) is Near Threatened (NT), whose habitat preference of open steppe habitat with short vegetation does not majorly overlap with the Project, but the species could rarely occur here. Anatolian Ground Squirrel has been recorded as literature data.

Mouse-tailed dormouse (*Myomimus roachi*) (VU). This region represents the southern end of its range, where it’s patchy, as opposed to its wider more continuous distribution up north, this might be a significant area for the species. Its habitat preference is mature woodland. The Project area has suitable habitats for the species, potentially around the switchyard area. Mouse-tailed dormouse has been recorded as literature data.

Brandt’s Hamster (*Mesocricetus brandti*) is Near Threatened (NT), whose habitat preference of dry open steppe vegetation does not majorly overlap with the Project, but the species could rarely occur here. Brandt’s Hamster has been recorded as literature data.

Table 4-11 Terrestrial Mammals Taxa and Threatened Categories Identified in the Project Area of Influence

Family	Species Name	English Name	Endemism	IUCN	BERN	CITES	Monitoring Criteria	Observation / Literature
Erinaceidae	*Erinaceus concolor*	Southern White-breasted Hedgehog	-	LC		-	-	L / O
Soricidae	*Neomys anomalus*	Iberian Water Shrew	-	LC	Ann -III	-	-	L
Soricidae	*Suncus etruscus*	Pygmy White-toothed Shrew	-	LC	Ann -III	-	-	L / O
Talpidae	*Talpa levantis*	Levantine Mole	-	LC	-	-	-	L
Leporidae	*Lepus europaeus*	European Hare	-	LC	-	-	-	L
Sciuridae	*Sciurus anomalus*	Caucasian Squirrel	-	LC	Ann -II	-	-	L
Sciuridae	*Spermophilus xanthoprymnus*	Anatolian Ground Squirrel	-	NT	Ann -III	-	-	L
Cricetidae	*Arvicola amphibius*	Eurasian Water Vole	-	LC	-	-	-	L / O
Cricetidae	*Microtus guentheri*	Günther's Vole	-	LC	-	-	-	L / O
Cricetidae	*Microtus subterraneus*	European Pine Vole	-	LC	-	-	-	L
Cricetidae	*Mesocricetus brandti*	Brandt's Hamster	-	NT	-	-	-	L
Muridae	*Apodemus mystacinus*	Eastern Broad-toothed Field Mouse	-	LC	-	-	-	L
Muridae	*Apodemus sylvaticus*	Long-tailed Field Mouse	-	LC	-	-	-	L
Muridae	*Rattus rattus*	House Rat	-	LC	-	-	-	L / O
Muridae	*Rattus norvegicus*	Brown Rat	-	LC	-	-	-	L
Spalacidae	*Nannospalax leucodon*	Lesser Blind Mole Rat	-	LC	-	-	-	L / O
Gliridae	*Dryomys nitedula*	Forest Dormouse	-	LC	Ann -III	-	-	L
Gliridae	*Myomimus roachi*	Roach's Mouse-tailed Dormouse	-	VU	Ann -II	-	-	L
Canidae	*Canis lupus*	Grey Wolf	-	LC	Ann -II	Ann -I	-	L
Canidae	*Canis aureus*	Golden Jackal	-	LC	-	Ann -III	-	L
Canidae	*Vulpes vulpes*	Red Fox	-	LC	-	Ann -III	-	L / O
Mustelidae	*Mustela nivalis*	Least Weasel	-	LC	Ann -III	-	-	L / O
Mustelidae	*Vormela peregusna*	Marbled Polecat	-	VU	Ann -II	-	-	L

Mustelidae	*Martes martes*	Pine Marten	-	LC	Ann -III	-	-	L / O
Mustelidae	*Martes foina*	Beech Marten	-	LC	Ann -III	Ann -III	-	L / O
Mustelidae	*Meles meles*	European Badger	-	LC	Ann -III	-	-	L
Felidae	*Felis silvestris*	European Wildcat	-	LC	Ann -II	Ann -II	-	L
Felidae	*Lynx lynx*	Eurasian Lynx	-	LC	Ann -III	Ann -II	-	L
Suidae	*Sus scrofa*	Wild Boar	-	LC	Ann -III	-	-	L / O
Cervidae	*Capreolus capreolus*	European Roe Deer	-	LC	Ann -III	-	-	L

4.3 Herpetofauna

4.3.1 Lesser Menderes Delta and Mahal Hills Key Biodiversity Area

The KBA (Key Biodiversity Area) report for the Mahal Hills, along with the online databases and resources reviewed, does not provide specific information regarding the presence of herpetofauna species relevant to the KBA in the region.

According to the Lesser Menderes Delta KBA database[7], there is one reptile mammal species within the area that does not trigger KBA criteria (Table 4-12). Common tortoise (*Testudo graeca*) is Vulnerable (VU) and was not observed in the field studies.

Table 4-12 KBA Herpetofauna Species

Family	Species	English Name	Observation Status
TESTUDINIDAE	*Testudo graeca*	Common tortoise	Not observed

4.3.2 Amphibia

The similar data as provided in the ESIA regarding amphibia has been obtained. A total of 7 herpetofauna species from 4 families were identified within the Project Area of Influence through a combination of field studies, literature reviews, and survey interviews. Among these species, 2 were directly observed during fieldwork, and 5 were identified through a thorough review of existing literature. (See Table 4-13).

There is no endemic amphibia species among the identified species.

Among the amphibia species identified in the Project Area of Influence, 1 species are listed in Annex II, 6 species in Annex III of the Bern Convention. According to the IUCN Red List, no species in the area are classified as endangered. All species are classified as Least Concern (LC), indicating they are not currently at significant risk of extinction. According to the CITES Convention, none of the seven species are listed in the annexes.

No permanent aquatic features, such as ponds, were identified within the boundaries of the project area during the field surveys. Nonetheless, temporary water bodies formed by excessive irrigation in adjacent agricultural lands were recorded, and the presence of target species was associated with these ephemeral habitats.

4.3.3 Reptilia

A total of 19 Reptilia species from 12 families were identified within the Project Area of Influence through a combination of field studies, literature reviews, and survey interviews. Among these species, 5 were directly observed during fieldwork, and 14 were identified through a thorough review of existing literature. (See Table 4-14)

There is no endemic reptile species among the identified species.

Among the Reptilia species identified in the Project Area of Influence, 8 species are listed in Annex II, 11 species in Annex III of the Bern Convention. According to the IUCN Red List, no species in the area are classified as endangered.

With the exception of one species, the remaining species are categorized as Least Concern (LC) by the IUCN, signifying that they are not presently at a significant risk of extinction. One species, *Testudo graeca*, is classified as Vulnerable (VU) under IUCN criteria and is also listed

[7] https://www.keybiodiversityareas.org/site/factsheet/761

in CITES Annex II. According to the CITES Convention, only two (Javelin Sand Boa and Common Tortoise) of the 19 species is included in its annexes.

The Anatolian Rock Lizard (*Anatololacerta oertzeni*), which is classified as Least Concern but is recognized as a regional endemic species, was identified in the ESIA report. However, the report does not provide any information regarding the source or methodology of this identification.

The Anatololacerta genus is a group of lizards distributed in South and Western Anatolia as well as some Aegean islands. Initially, three species were defined within this genus. However, recent molecular studies have revealed that the genetic diversity actually includes more cryptic species. Following these studies, five separate species have been defined: *Anatololacerta anatolica*, *Anatololacerta danfordi*, *Anatololacerta pelasgiana*, *Anatololacerta ibrahimi*, and *Anatololacerta finikensis*. In this context, the populations of the genus in the Aydın region are considered to fall under the species *Anatololacerta pelasgiana* (Bellati et al., 2015; Speybroeck et al., 2020; Karakasi et al., 2021).

The *Anatololacerta pelasgiana* (Pelasgian Rock Lizard) is not endemic, but it has a regional distribution, and its IUCN Red List category is "LC (Least Concern)." In this context, with up-to-date information, this species has not been considered a critical species. Pelasgian Rock Lizard has been recorded as literature data.

The *Anatololacerta anatolica* (Anatolian Rock Lizard) is not endemic, but it has a regional distribution, and its IUCN Red List category is "LC (Least Concern)." In this context, with up-to-date information, this species has not been considered a critical species. Anatolian Rock Lizard has been recorded as literature data.

Table 4-13 Amphibia Taxa and Threatened Categories Identified in the Project Area of Influence

Family	Species Name	English Name	Endemism	IUCN	BERN	CITES	Monitoring Criteria	Observation / Literature
Pelobatidae	*Pelobates syriacus*	Syrian Spadefoot	-	LC	Ann -II	-	-	L
Bufonidae	*Bufo bufo*	Common Toad	-	LC	Ann -III	-	-	L / O
Bufonidae	*Bufotes viridis*	Green Toad	-	LC	Ann -III	-	-	L / O
Hylidae	*Hyla orientalis*	Shelkovnikov's Tree Frog	-	LC	Ann -III	-	-	L
Ranidae	*Pelophylax ridibundus*	Marsh Frog	-	LC	Ann -III	-	-	L
Ranidae	*Rana macrocnemis*	Brusa Frog	-	LC	Ann -III	-	-	L
Ranidae	*Pelophylax bedriagae*	Bedriaga's Frog	-	LC	Ann -III	-	-	L

Table 4-14 Reptilia Taxa and Threatened Categories Identified in the Project Area of Influence

Family	Species Name	English Name	Endemism	IUCN	BERN	CITES	Monitoring Criteria	Observation / Literature
Testudinidae	*Testudo graeca*	Common Tortoise	-	VU	Ann -II	Ann -II	X	L
Gekkonidae	*Hemidactylus turcicus*	Turkish Gecko	-	LC	Ann -III	-	-	L
Agamidae	*Laudakia stellio*	Starred Agama	-	LC	Ann -II	-	-	L
Scincidae	*Ablepharus kitaibelii*	Juniper Skink	-	LC	Ann -II	-	-	L
Scincidae	*Heremites auratus*	Levant skink	-	LC	Ann -III	-	-	L
Lacertidae	*Podarcis muralis*	Common Wall Lizard	-	LC	Ann -II	-	-	L
Lacertidae	*Anatololacerta anatolica*	Anatolian Rock Lizard	-	LC	Ann -III	-	-	L
Lacertidae	*Anatololacerta pelasgiana*	Pelasgian Rock Lizard	-	LC	Ann -III	-	-	L
Lacertidae	*Ophisops elegans*	Snake-eyed Lizard	-	LC	Ann -II	-	-	O / L
Anguidae	*Pseudopus apodus*	Sheltopusik	-	LC	Ann -II	-	-	O / L
Blanidae	*Blanus strauchi*	Turkish Worm Lizard	-	LC	Ann -III	-	-	L
Typhlopidae	*Xerotyphlops vermicularis*	Eurasian Blind Snake	-	LC	Ann -III	-	-	O / L
Boidae	*Eryx jaculus*	Javelin Sand Boa	-	LC	Ann -III	Ann -II	-	L
Colubridae	*Dolichophis caspius*	Large Whip Snake	-	LC	Ann -III	-	-	L
Colubridae	*Platyceps collaris*	Collared Dwarf Racer	-	LC	Ann -II	-	-	L
Colubridae	*Eirenis modestus*	Ring-Headed Dwarf Snake	-	LC	Ann -III	-	-	O / L
Colubridae	*Zamenis situla*	European Ratsnake	-	LC	Ann -III	-	-	O / L
Psammophiidae	*Malpolon monspessulanus*	*Western Montpellier Snake*	-	LC	Ann -III	-	-	L
Viperidae	*Montivipera xanthina*	Ottoman viper	-	LC	Ann -II	-	-	L

4.4 Bird

4.4.1 Vantage Point Observations

VP methodology records bird “contacts” and the results therefore are expected to feature repeat “contacts” of the same individuals especially for resident species.

Spring

During spring VP surveys, a total of 158 birds were detected at the site (Table 4-15). The most frequently encountered species was the Short-toed Snake-Eagle (*Circaetus gallicus*), with 90 contacts observed, all of which were residents. Other notable observations included the Common Buzzard (*Buteo buteo*) with 51 resident contacts , and Eleonora's Falcon (*Falco eleonorae*) with 8 resident behaving- contacts. Despite the variety of species observed, no threatened species were recorded during the survey.

Table 4-15 Total number of soaring migratory and resident bird species observed in spring 2024.

Common Name	Scientific Name	IUCN	Migrant	Resident	Total
Short-toed Snake-Eagle	*Circaetus gallicus*	LC	-	90	90
Common Buzzard	*Buteo buteo*	LC	-	51	51
Eleonora's Falcon	*Falco eleonorae*	LC	-	8	8
Eurasian Sparrowhawk	*Accipiter nisus*	LC	-	3	3
Eurasian Kestrel	*Falco tinnunculus*	LC	-	2	2
Peregrine Falcon	*Falco peregrinus*	LC	-	1	1
Long-legged Buzzard	*Buteo rufinus*	LC	-	1	1
unidentified Raptor	*Accipitridae sp.*	-	-	1	1
Montagu's Harrier	*Circus pygargus*	LC	1	-	1
Total	-	-	1	157	158

During spring 2024, a survey averaging approximately 42 hours and 42 minutes was conducted per vantage point. Over this period, 1 bird was identified as a migrant. The migration rate was determined to be 0.02 birds per hour for the spring migratory season.

Among the birds observed, 130 were reported to fly at risk zone (Table 4-16). The species that most frequently entered the risk zone was Short-toed Snake-Eagle (*Circaetus gallicus*). However, these numbers do not represent unique birds and contain multiple reports of the same bird for residents.

Table 4-16 Resident and migrant bird occurrences at risk zone in spring 2024.

Common Name	Scientific Name	IUCN	Migrant	Resident	Total
Short-toed Snake-Eagle	*Circaetus gallicus*	LC	-	72	72
Common Buzzard	*Buteo buteo*	LC	-	45	45
Eleonora's Falcon	*Falco eleonorae*	LC	-	5	5
Eurasian Sparrowhawk	*Accipiter nisus*	LC	-	2	2
Eurasian Kestrel	*Falco tinnunculus*	LC	-	2	2
Peregrine Falcon	*Falco peregrinus*	LC	-	1	1
Long-legged Buzzard	*Buteo rufinus*	LC	-	1	1
unidentified Raptor	*Accipitridae xx*	-	-	1	1
Montagu's Harrier	*Circus pygargus*	LC	1	-	1
Total	-	-	1	129	130

Summer

During summer VP surveys, a total of 160 birds were detected at the site (Table 4-17). The most frequently encountered species was the Eleonora's Falcon (*Falco eleonorae*), with 65 contacts observed, all of which were residents. Other notable observations included the Short-toed Snake-Eagle (*Circaetus gallicus*) and Common Buzzard (*Buteo buteo*) with 45 and 23 resident contacts, respectively. No threatened species were observed during summer VP surveys.

Table 4-17 Total number of soaring migratory and resident bird species observed in summer 2024.

Common Name	Scientific Name	IUCN	Migrant	Resident	Total
Eleonora's Falcon	*Falco eleonorae*	LC	-	65	65
Short-toed Snake-Eagle	*Circaetus gallicus*	LC	-	45	45
Common Buzzard	*Buteo buteo*	LC	-	23	23
European Honey-buzzard	*Pernis apivorus*	LC	1	9	10
Eurasian Sparrowhawk	*Accipiter nisus*	LC	-	8	8
Eurasian Kestrel	*Falco tinnunculus*	LC	-	4	4
Black Stork	*Ciconia nigra*	LC	-	2	2
unidentified Raptor	*Accipitridae spp.*	-	-	2	2
unidentified Buzzard	*Buteo sp.*	-	-	1	1
Total	-	-	1	159	160

During the summer of 2024 a survey averaging approximately 40 hours and 2 minutes was conducted per vantage point. Over this period, 1 bird was identified as migrant. The migration rate was determined to be 0.02 birds per hour for the spring migratory season.

Among the birds observed, 117 (about 73% of all observed birds) were reported to fly at risk height (at rotor height and below and 500 m buffer of the project site) (Table 4-18). Majority of birds that entered the risk zone were resident. The species that most frequently entered the risk zone was Eleonora's Falcon (*Falco eleonorae*). However, these numbers do not represent unique birds and contain multiple reports of the same bird for residents.

Table 4-18 Resident and migrant bird occurrences at risk zone in summer 2024.

Common Name	Scientific Name	IUCN	Migrant	Resident	Total
Eleonora's Falcon	*Falco eleonorae*	LC	-	62	62
Short-toed Snake-Eagle	*Circaetus gallicus*	LC	-	32	32
Common Buzzard	*Buteo buteo*	LC	-	10	10
European Honey-buzzard	*Pernis apivorus*	LC	-	5	5
Eurasian Sparrowhawk	*Accipiter nisus*	LC	-	5	5
Eurasian Kestrel	*Falco tinnunculus*	LC	-	2	2
unidentified Raptor	*Accipitridae sp.*	-	-	1	1
Total	-	-	-	117	117

Autumn

During autumn VP surveys, a total of 142 birds were detected at the site (Table 4-19). The most frequently encountered species was the Common Buzzard (*Buteo buteo*), with 41 contacts observed, all of which were residents. Other notable observations included the Short-toed Snake Eagle (*Circaetus gallicus*) and Eurasian Sparrowhawk (*Accipiter nisus*) with 34 and 39 contacts, respectively. Despite the variety of species, no threatened species were recorded during the survey.

Table 4-19 Total number of soaring migratory and resident bird species observed in autumn 2024.

Common Name	Scientific Name	IUCN	Migrant	Resident	Total
Common Buzzard	*Buteo buteo*	LC	-	41	41
Short-toed Snake-Eagle	*Circaetus gallicus*	LC	-	34	34
Eurasian Sparrowhawk	*Accipiter nisus*	LC	9	30	39
European Honey-buzzard	*Pernis apivorus*	LC	8	1	9
Eurasian Marsh-Harrier	*Circus aeruginosus*	LC	5	-	5
Eurasian Kestrel	*Falco tinnunculus*	LC	2	4	6
Eleonora's Falcon	*Falco eleonorae*	LC	-	3	3
Peregrine Falcon	*Falco peregrinus*	LC	-	1	1
Booted Eagle	*Hieraaetus pennatus*	LC	1	-	1
unidentified Falcon	*Falco spp.*	-	1	1	2
Montagu's Harrier	*Circus pygargus*	LC	1	-	1
Total	-	-	27	115	142

During the autumn of 2024, a survey averaging approximately 46 hours and 22 minutes was conducted per vantage point. Over this period, 27 birds were identified as migrants. The migration rate was determined to be 0.58 birds per hour for the autumn migratory season.

Among the birds observed, 65 (about 46% of all observed birds) were reported to fly at risk height (at rotor height and below and 500 m buffer of the project site) (Table 4-20). The species that most frequently entered the risk zone was Short-toed Snake-Eagle (*Circaetus gallicus*). However, these numbers do not represent unique birds and contain multiple reports of the same bird for residents.

Table 4-20 Resident and migrant bird occurrences at risk zone in autumn 2024.

Common Name	Scientific Name	IUCN	Migrant	Resident	Total
Short-toed Snake-Eagle	*Circaetus gallicus*	LC	-	21	21
Common Buzzard	*Buteo buteo*	LC	-	16	16
Eurasian Sparrowhawk	*Accipiter nisus*	LC	6	12	18
European Honey-buzzard	*Pernis apivorus*	LC	3	-	3
Eleonora's Falcon	*Falco eleonorae*	LC	-	2	2
Eurasian Kestrel	*Falco tinnunculus*	LC	2	2	4
Peregrine Falcon	*Falco peregrinus*	LC	-	1	1
Total	-	-	11	54	65

4.4.2 ETL Observations

Spring

During the spring 2024 surveys at VP ETL points, a total of 180 birds were detected across various species (Table 4-21). Out of these, 70 birds, which account for approximately 39% of the total, were observed flying at the height of the transmission lines, placing them at potential risk of collision. The most common species observed was the Common Buzzard (*Buteo buteo*), with 81 contacts detected and 31 of them flying at risk height. Other notable species include the White Stork (*Ciconia ciconia*) with 34 contacts observed, 22 of which were at risk height, and the Black Stork (*Ciconia nigra*) with 9 contacts, 7 of which were at risk height.

With the available data, bird passages are relatively high at VP ETL4 mainly due to repeat activity from resident Common Buzzard.

Table 4-21 Total number of bird species observed at VP ETL points at risk height in spring 2024.

Common Name	Scientific Name	IUCN	VP ETL1	VP ETL2	VP ETL3	VP ETL4	Total
Common Buzzard	Buteo buteo	LC	5	1	2	23	31
White Stork	Ciconia ciconia	LC	-	-	17	5	22
Black Stork	Ciconia nigra	LC	-	-	-	7	7
Eurasian Kestrel	Falco tinnunculus	LC	-	-	-	4	4
Eurasian Sparrowhawk	Accipiter nisus	LC	-	1	-	2	3
Northern Goshawk	Accipiter gentilis	LC	-	2	-	-	2
Peregrine Falcon	Falco peregrinus	LC	-	-	-	1	1
Eleonora's Falcon	Falco eleonorae	LC	-	-	-	-	-
Long-legged Buzzard	Buteo rufinus	LC	-	-	-	-	-
Eurasian Marsh-Harrier	Circus aeruginosus	LC	-	-	-	-	-
Short-toed Snake-Eagle	Circaetus gallicus	LC	-	-	-	-	-
Total	-	-	5	4	19	42	70

Summer

During the Summer 2024 surveys at VP ETL points, a total of 136 birds were detected across various species (Table 4-22). Out of these, 38 birds, which account for approximately 38% of the total, were observed flying at the height of the transmission lines, placing them at potential risk of collision. The most common species observed was the Common Buzzard (*Buteo buteo*), with 63 contacts detected and 26 of them flying at risk height.

Table 4-22 Total number of bird species observed at VP ETL points at risk height in Summer 2024.

Common Name	Scientific Name	IUCN	Status	VP ETL1	VP ETL2	VP ETL3	VP ETL4	Total
Common Buzzard	Buteo buteo	LC	Resident	-	3	9	14	26
Eurasian Sparrowhawk	Accipiter nisus	LC	Resident	2	2	-	-	4
Peregrine Falcon	Falco peregrinus	LC	Resident	-	-	-	2	2
Black Stork	Ciconia nigra	LC	Migrant	-	-	-	2	2
Short-toed Snake-Eagle	Circaetus gallicus	LC	Resident	-	-	2	-	2
Eleonora's Falcon	Falco eleonorae	LC	Resident	1	-	-	-	1
White Stork	Ciconia ciconia	LC	Migrant	-	-	1	-	1
Total	-	-		3	5	12	18	38

Autumn

During the Autumn 2024 surveys at VP ETL points, a total of 211 birds were detected across various species (Table 4-23). Out of these, 67 birds, which account for approximately 32% of the total, were observed flying at the height of the transmission lines, placing them at potential risk of collision. The most common species observed was the Common Buzzard (*Buteo buteo*), with 76 contacts detected and 36 of them flying at risk height. Another notable species includes the Eurasian Sparrowhawk (*Accipiter nisus*) with 57 contacts observed, 14 of which were at risk height.

Table 4-23 Total number of bird species observed at VP ETL points at risk height in Autumn 2024.

Common Name	Scientific Name	IUCN	Status	VP ETL1	VP ETL2	VP ETL3	VP ETL4	Total
Common Buzzard	*Buteo buteo*	LC	Resident	2	1	6	27	36
Eurasian Sparrowhawk	*Accipiter nisus*	LC	Resident	2	7	-	5	14
Peregrine Falcon	*Falco peregrinus*	LC	Resident	-	-	-	8	8
Short-toed Snake-Eagle	*Circaetus gallicus*	LC	Resident	-	-	-	6	6
Eurasian Kestrel	*Falco tinnunculus*	LC	Resident	1	-	1	1	3
Total	-	-		5	8	7	47	67

Summary

Based on the surveys conducted in spring, summer, and autumn 2024 at the transmission line points (VPs ETL1, ETL2, ETL3, and ETL4), the overall risk of bird collision with the Energy Transmission Lines varies (Figure 4-2). The risk is relatively low for TL1, TL2, and TL3, while TL4 presents a high level of collision risk. Across all seasons, a total of 527 birds were detected, with 175 birds (approximately 33%) observed flying at the height of the transmission lines, placing them at potential risk of collision. In spring, 39% of the birds observed flew at the height of the transmission lines, with the majority of these birds being Common Vulture, White Stork and Black Stork. Likewise, in summer, about 28% of the birds observed were at the risk height, with Common Buzzard being the most common species. In Autumn, 32% of birds were at risk height, with Common Vulture and Eurasian Sparrowhawk being the most frequently observed species.

Table 4-24 Total number of bird species observed across all TL points.

Common Name	Scientific Name	IUCN	Status	VP ETL1	VP ETL2	VP ETL3	VP ETL4	Total	Total Risk
Common Buzzard	*Buteo buteo*	LC	Resident	21	61	46	92	220	93
Short-toed Snake-Eagle	*Circaetus gallicus*	LC	Resident	10	30	19	30	89	8
Eurasian Sparrowhawk	*Accipiter nisus*	LC	Resident	22	30	7	13	72	21
European Honey-buzzard	*Pernis apivorus*	LC	Resident	8	37	-	-	45	-
White Stork	*Ciconia ciconia*	LC	Migrant	-	-	24	11	35	23
Eleonora's Falcon	*Falco eleonorae*	LC	Resident	7	6	1	3	17	1
Peregrine Falcon	*Falco peregrinus*	LC	Resident	-	1	-	13	14	11
Black Stork	*Ciconia nigra*	LC	Migrant	2	-	-	12	14	9
Eurasian Kestrel	*Falco tinnunculus*	LC	Resident	5	1	1	7	14	7
Northern Goshawk	*Accipiter gentilis*	LC	Resident	-	3	-	-	3	2
Booted Eagle	*Hieraaetus pennatus*	LC	Resident	-	1	-	-	1	-
Long-legged Buzzard	*Buteo rufinus*	LC	Resident	-	1	-	-	1	-
Eurasian Marsh-Harrier	*Circus aeruginosus*	LC	Resident	-	1	-	-	1	-
Unidentified Raptor	*Accipiter sp.*	-	Resident	-	-	1	-	1	-
Total	-	-		75	172	99	181	527	175

The TL4 represents a significant collision risk (Table 4-25, Figure 4-2) due to the relatively high frequency of high-risk passes recorded for Common Vulture (64), Peregrine Falcon (11) and Black Stork (9).

Table 4-25 Risk quantification values of each TL point based on passage rates.

Season	VP ETL1	VP ETL2	VP ETL3	VP ETL4
Spring	0.12	0.09	0.63	0.91
Summer	0.07	0.10	0.22	0.38
Autumn	0.11	0.19	0.16	1.04
Average	0.10	0.13	0.34	0.78

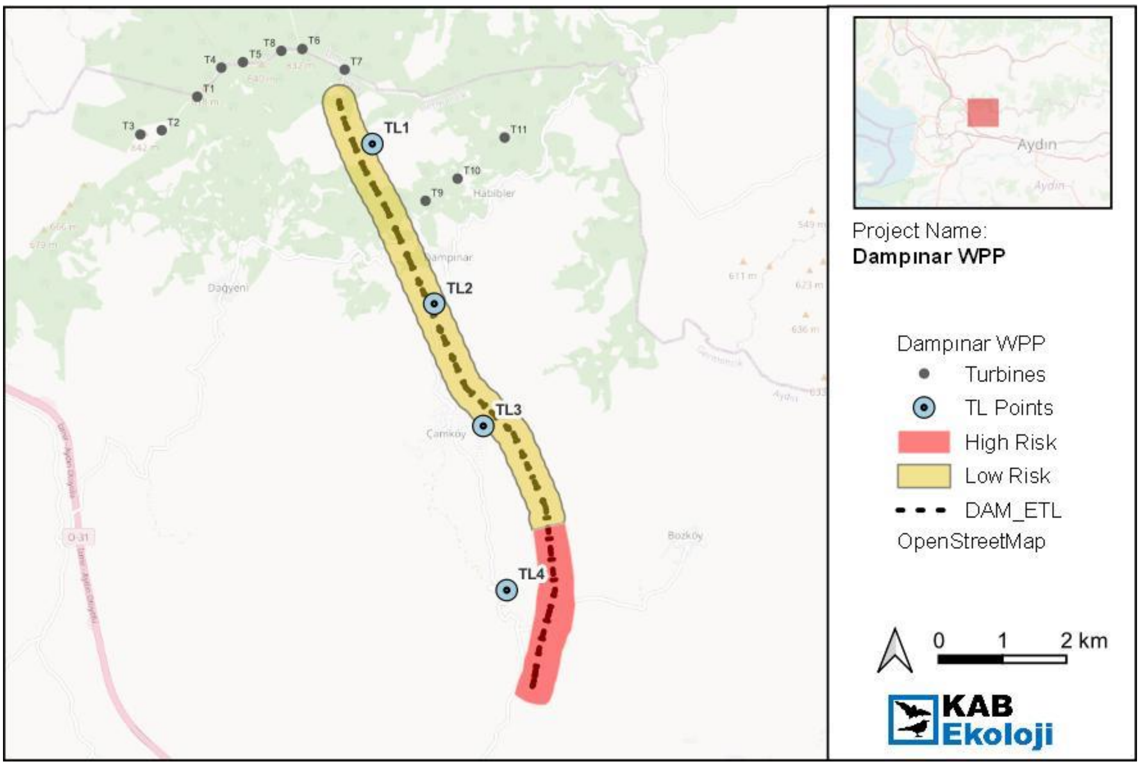

Figure 4-2 ETL segment risk assessment.

4.4.3 Collision Risk Model

For collision risk model, the average time spent at each VP for each season was utilized. It would be the most optimal and would provide the best possible results if the individual VP efforts are very similar. However often in field conditions survey effort at each VP may vary due to logistics, weather, surveyor wellbeing and other circumstances that may arise. While bigger differences in survey effort may degrade the predictive power of the model at locations where target bird species are highly active, where activity is even and at low – moderate levels the model's estimations are not considered significantly.

VP observations, where appropriate, ran in parallel to ETL observations to optimize field survey schedules, if shared VPs were available Similar to the first point, while for busy airspaces (such as major migration routes) this would have a negative impact on study results, at locations lower rates of activity, the two methodologies are compatible and do not detract from survey effort. This is due to NatureScot methodology not involving continuous surveillance of the airspace, but rather surveillance at intervals (every 5 minutes). The two methodologies can be stacked due to the interval observations approach.

Total daylight hours in each season are calculated based on 12 hours for residents and 10 hours for migrants. This is a practice that enhances the predictive power of the model which is backed by studies of migrant behaviour from Istanbul migration counts. Migrant soaring species, relative to their resident counterparts, are mostly inactive before the sun is higher and the thermal air currents are better developed since energy conservation during migration is of critical importance. This behaviour is reflected in the hourly distribution of bird passages in most raptor counts (typically between 09:00 and 17:00). Therefore, 2 hours from daylight are subtracted to reflect migrant active hours in the model. There are one published and two unpublished reports on the bird migration over the Bosporus, which also features analysis of the hourly distribution of birds.[8][9][10]

Spring

Sample collision risk calculation for migrant species is shown in Table 4-26. Calculation for all species with risk above 0 is shown on Table 4-27.

Table 4-26 Mortality rate calculation for migrant species in detail (spring).

Variable	Value	Unit
Species	Montagu's Harrier	
Recorded number of birds at risk height/zone	1	birds
Duration of observation	42.71	hr/VP
Study Period	2024-03-01	
	2024-06-15	
Total migration hours	1070	hr
Estimated number of birds at risk height/zone (n)	25	birds
N	11	
width	8445	m
height	180	m
W	1520100	m2
A	164528.3	m2
A/W	0.11	%
n x (A/W)	2.71	birds
P. Probability of bird being hit when flying through the rotor	0.12	
Mortality rate without avoidance	0.32	birds
(1 - avoidance rate)	0.02	
Mortality estimation per year	0.01	birds

[8] Üner, Ö., Boyla, K.A., Bacak, E., Birel, E., Çelikoba, İ., Dalyan, C., Tabur, E. & Yardım, Ü. (2006). Spring migration of soaring birds over the Bosphorus, Turkey, in 2006. Sandgrouse 32.

[9] İKGT. (2010). 2010 İstanbul Boğazı Kuş Göçü Sayımları. İstanbul Kuş Gözlem Topluluğu, İstanbul.

[10] Bilgin, S., Boyla, K.A. & Topluluğu, İ.K.G. (2011). İstanbul Boğazı Göçü–İlkbahar 2011. İstanbul Kuş Gözlem Topluluğu, İstanbul.

Table 4-27 The estimated mortality rates of migrant species in spring 2024 (mort. w/o avo.: mortality without avoidance, mort. w/ avo.: mortality with avoidance)

Common Name	observed	# observed	# thru rotors	Mort. w/o avo.	Mort. w/ avo.
Montagu's Harrier	1	25	2.71	0.32	0.01
Total	1	25	2.71	0.32	0.01

Sample collision risk calculation for resident species is shown in Table 4-28. Calculation for all species with risk above 0 is shown on Table 4-29.

Table 4-28 Mortality rate calculation for resident species in detail.

Variable	Value	Unit
Species	Short-toed Snake-Eagle	
Total duration of individual bird observations	2847.71	sec
Total duration of observations	42.71	hr/VP
Study Period	2024-03-01	
	2024-06-15	
Total migration hours	1284	hr
Estimated total birds x seconds	85620.35	bird x sec
N	11	
Area	6398284	m2
height	150.3	m
Vw	961662085	m3
Sweeping Area	165962.1	m2
r	69.3	m
d	4	m
L	0.66	m
Vr = N x πR2 x (d + l)	772553.8	m3
n	85620.35	sec
n x (Vr / Vw)	68.78	sec
v	13.4	m/s
t = (d + l) / v	0.35	sec
n x (Vr / Vw) / t	198	birds
Probability of bird being hit when flying through the rotor	0.09	
Mortality rate without avoidance	17.23	birds
(1 - avoidance rate)	0.02	
Mortality estimation for study period	0.34	birds

Table 4-29 The estimated mortality rates of resident species in spring 2024 (mort. w/o avo.: mortality without avoidance, mort. w/ avo.: mortality with avoidance)

Common Name	Total	Total (sec/year)	Occupancy	# passage	Mort. w/o avo.	Mort. w/ avo.
Short-toed Snake-Eagle	2848	85620	69	198	17.23	0.34
Common Buzzard	896	26948	21	54	5.07	0.10
Eleonora's Falcon	176	5295	4	12	0.90	0.02
Long-legged Buzzard	30	902	1	2	0.17	0.00
Peregrine Falcon	30	902	1	2	0.16	0.00

Common Name	Total	Total (sec/year)	Occupancy	# passage	Mort. w/o avo.	Mort. w/ avo.
Total	3980	119667	95	267	23.52	0.47

Summer

Sample collision risk calculation for migrant species was not calculated as no migrant species was observed at risk zone.

The calculation for resident species is shown in Table 4-30. Calculation for all species with risk above 0 is shown on Table 4-31.

Table 4-30 Mortality rate calculation for resident species in detail (summer).

Variable	Value	Unit
Species	Eleonora's Falcon	
Recorded number of birds at risk height/zone	5817.44	birds
Duration of observation	40.03	hr/VP
Study Period	2024-06-16	
	2024-08-31	
Total migration hours	924	hr
Estimated number of birds at risk height/zone (n)	134270.89	birds
N	11	
width	6398284	m
height	150.3	m
W	961662085	m2
A	165962.1	m2
A/W	69.3	%
n x (A/W)	4	birds
P. Probability of bird being hit when flying through the rotor	0.39	
Mortality rate without avoidance	728573.8	birds
(1 - avoidance rate)	134270.89	
Mortality estimation per year	101.73	birds

Table 4-31 The estimated mortality rates of resident species in summer 2024 (mort. w/o avo.: mortality without avoidance, mort. w/ avo.: mortality with avoidance)

Common Name	Total	Total (sec/year)	Occupancy	# passage	Mort. w/o avo.	Mort. w/ avo.
Eleonora's Falcon	5817	134271	102	297	22.84	0.46
Short-toed Snake-Eagle	2613	60321	48	139	12.14	0.24
Common Buzzard	355	8195	6	16	1.54	0.03
Eurasian Sparrowhawk	194	4482	3	9	0.73	0.01
European Honey-buzzard	145	3337	3	7	0.63	0.01
Others	90	2087	2	4	0.36	0.01
Total	9215	212692	164	472	38.23	0.76

Autumn

Sample collision risk calculation for migrant species is shown in Table 4-32. Calculation for all species with risk above 0 is shown on Table 4-33.

Table 4-32 Mortality rate calculation for migrant species in detail (autumn).

Variable	Value	Unit
Species	Eurasian Sparrowhawk	
Recorded number of birds at risk height/zone	6	birds
Duration of observation	46.36	hr/VP
Study Period	2024-09-01	
	2024-11-15	
Total migration hours	760	hr
Estimated number of birds at risk height/zone (n)	98.36	birds
N	11	
width	6703	m
height	150.3	m
W	1007461	m2
A	165962.1	m2
A/W	0.16	%
n x (A/W)	16.2	birds
P. Probability of bird being hit when flying through the rotor	0.08	
Mortality rate without avoidance	1.36	birds
(1 - avoidance rate)	0.02	
Mortality estimation per year	0.03	birds

Table 4-33 The estimated mortality rates of migrant species in autumn 2024 (mort. w/o avo.: mortality without avoidance, mort. w/ avo.: mortality with avoidance)

Common Name	observed	# observed	# thru rotors	Mort. w/o avo.	Mort. w/ avo.
Eurasian Sparrowhawk	6	98.36	16.2	1.36	0.03
European Honey-buzzard	3	49.18	8.1	0.70	0.01
Eurasian Kestrel	2	32.79	5.4	0.50	0.01
Total	11	180.32	29.71	2.57	0.05

Sample collision risk calculation for resident species is shown in Table 4-34. Calculation for all species with risk above 0 is shown on Table 4-35.

Table 4-34 Mortality rate calculation for resident species in detail (autumn).

Variable	Value	Unit
Species	Short-toed Snake-Eagle	
Total duration of individual bird observations	1945.48	sec
Total duration of observations	46.36	hr/VP
Study Period	2024-09-01	
	2024-11-15	
Total migration hours	912	hr
Estimated total birds x seconds	38270.89	bird x sec
N	11	
Area	6398284	m2
height	150.3	m
Vw	961662085	m3
Sweeping Area	165962.1	m2

Variable	Value	Unit
r	69.3	m
d	4	m
L	0.66	m
Vr = N x πR2 x (d + l)	772553.8	m3
n	38270.89	sec
n x (Vr / Vw)	30.75	sec
v	13.4	m/s
t = (d + l) / v	0.35	sec
n x (Vr / Vw) / t	88.5	birds
Probability of bird being hit when flying through the rotor	0.09	
Mortality rate without avoidance	7.70	birds
(1 - avoidance rate)	0.02	
Mortality estimation for study period	0.15	birds

Table 4-35 The estimated mortality rates of resident species in autumn 2024 (mort. w/o avo.: mortality without avoidance, mort. w/ avo.: mortality with avoidance)

Common Name	Total	Total (sec/year)	Occupancy	# passage	Mort. w/o avo.	Mort. w/ avo.
Short-toed Snake-Eagle	1945	38271	31	89	7.70	0.15
Common Buzzard	792	15577	12	31	2.93	0.06
Eurasian Sparrowhawk	376	7389	6	14	1.21	0.02
Eleonora's Falcon	60	1180	1	3	0.20	0.00
Peregrine Falcon	53	1051	1	2	0.18	0.00
Others	47	917	1	2	0.15	0.00
Total	3273	64385	51	140	12.38	0.25

4.4.4 Additive Collision Risk (Project Galeforce)

Since each WPP within the financial package is a project of Project Galeforce consisting of 9 WPPs, the Lenders would like an evaluation of avian collision risks of the package in its entirety. The additive collision risk which is a collation of collision risk estimation results from each project are presented in this section.

It should be noted that this section presents an "additive" collision risk evaluation, not a "cumulative" evaluation. Previously, the Consultant has provided a regional, high-level, qualitative assessment for the Project. In this assessment, the Project's potential impact on the migratory flyways was considered. Submitted qualitative assessment in ESIA Report for each project's Chapter 17 was based on Gauld et al (2022) study[11] where collision vulnerability of migratory species is identified which was also restricted by the lack of data for majority of the grids for the regional assessment.

The main limitations regarding a qualitative Cumulative Collision Risk for the Project are (1) WPPs in Türkiye either do not carry out collision risk assessments or mortality studies, or do not

[11] Gauld et al (2022). Hotspots in the grid: Avian sensitivity and vulnerability to collision risk from energy infrastructure interactions in Europe and North Africa. Journal of Applied Ecology.

carry those up to IFI standards, or if conducted, do not publicly disclose such studies, and this leads to (2) a lack of credible publications on mortality risks for WPPs in Türkiye which the quantitative cumulative assessment for Project Galeforce would have benefitted from in terms of data points.

Furthermore, (3) a regional level Cumulative CRA requires an understanding of how the WPPs in the region might potentially synergize, publications on which are not available from the region either. (4) Due to the vast geographical extent of the Project Galeforce, the variety of terrain and habitats, etc., gathering the data needed for a quantitative cumulative assessment is a high effort and long-term task.

Finally, (5) a cumulative risk assessment of the 9 WPPs would need to include rates associated with ETL collision mortality since those are considered project components, the quantitative data for which is also scarce from the region, and modelling methods, such as those associated with turbine mortality, are not well established in literature. These limitations must be considered if a cumulative collision risk assessment is to be undertaken in the future.

For the additive assessment section of the interim reports, National EIA data was incorporated into the evaluations for the purpose of having as little data gap as possible. However, it was already well established that the National EIA collision risk tables were incomplete on multiple accounts, such as on project or season levels, or had methodological inconsistencies or gaps that challenged robust comparison. Additionally, the risk tables clock almost all mortality estimations at “zero” except for *Buteo buteo* at 0.03 bird/spring season at Dampınar, and *Falco tinnunculus* at 0.03 birds/spring season for Akköy.

With the completion of the supplementary baseline in 2024 at hand, which was conducted by the same team, applying consistent methodology over 3 seasons across all projects over the same time period, and seeing that the inclusion of National EIA would simply complicate the dataset and dilute the risk estimations, it is more sensible to only consider 2024 results in the final baseline report for 2024 and interim reports for 2024 baseline may be reviewed for a compilation of National EIA results.

An overview of baseline collision risk estimation at each project broken down by resident or migrant status, covering spring, summer and autumn seasons based on 2024 studies are shown in Table 4-36. The results demonstrate that baseline risk over the study period was driven mainly by resident activity as opposed to migratory movement over the minor pathways which was a picture that was already emerging at the interim stage.

It is important to note that none of the 2024 surveys account for winter periods. Though activity in winter is expected to be significantly diminished, it is not expected to be non-existent either. projects located in high altitudes, with extensive precipitation and high winds over the winter are not expected to host significant activity over the winter (e.g. Kestanederesi, potentially) while those projects in lowlands and near important wetlands may indeed receive activity (such as Ihlamur, with anecdotal findings, and Akköy, near a well-known protected wetland for wintering bird species). Therefore, the data from the three seasons was not extrapolated to cover winter (such as substituting an average or a minimum value or applying a coefficient to represent “winter” data) since the effect of winter on collision risk is mixed across the projects.

The table features additional lines to account for the potential effect of the discontinued surveys in Hacıhıdırlar WPP which resulted in missed seasons for autumn and summer. The line 8 WPP without Hacıhıdırlar calculates the %migrant and collision per turbine per year values without the project. The line 8 WPP with extrapolated Hacıhıdırlar is obtained by assuming the same collision risk values in summer and autumn as the spring results for the project.

Table 4-36 Collision risk summary for Project Galeforce and each of its projects as calculated in 2024

Project	Migrant /yr*	Resident /yr*	Total /yr*	%migrant	Turbine count	Collision/ turbine/ yr*
Akköy	0.05	0.49	0.54	9.26	6	0.09
Armutçuk	0.19	0.43	0.62	30.65	20	0.03
Dampınar	0.06	1.44	1.50	4.00	11	0.14
Hacıhıdırlar**	0.00	0.50	0.50	0.00	15	0.03
Harmancık	0.05	0.06	0.11	45.45	10	0.01
Ihlamur	0.27	2.51	2.78	9.71	18	0.15
Kestanederesi	0.18	5.10	5.28	3.41	28	0.19
Ovacık	0.07	0.16	0.23	30.43	13	0.02
Uygar	0.65	1.76	2.41	26.97	60	0.04
Project Galeforce	1.52	12.45	13.97	10.88	181	0.08
8 WPP (- Hacıhıdırlar)	1.52	11.95	13.47	11.28	166	0.08

*Though denoted year (yr), the survey period consists of spring, summer and autumn, and does not account for winter periods

**Hacıhıdırlar WPP baseline collection was disrupted, and summer and autumn data could not be collected.

The data table summarizing the project specific collision risk estimations from the data is presented in Table 4-37.

Table 4-37 Additive Collision Risk Assessment summary for the Project Galeforce

Common Name	Projects	Migrant	Resident	Total
Black Kite	Harmancık	0.00	0.00	0.00
Subtotal		0.00	0.00	0.00
Black Stork	Ihlamur	0.00	0.02	0.02
	Uygar	0.01	0.01	0.02
Subtotal		0.01	0.03	0.04
Booted Eagle	Akköy	0.00	0.00	0.00
	Armutçuk	0.00	0.00	0.00
	Harmancık	0.00	0.00	0.00
	Ihlamur	0.01	0.00	0.01
	Kestanederesi	0.00	0.02	0.02
	Ovacık	0.01	0.00	0.01
	Uygar	0.00	0.02	0.02
Subtotal		0.02	0.04	0.06
Common Buzzard	Akköy	0.00	0.01	0.01
	Armutçuk	0.15	0.21	0.36
	Dampınar	0.00	0.19	0.19
	Hacıhıdırlar	0.00	0.40	0.40
	Harmancık	0.02	0.03	0.05
	Ihlamur	0.11	0.50	0.61
	Kestanederesi	0.00	1.00	1.00
	Ovacık	0.02	0.10	0.12
	Uygar	0.25	0.98	1.23
Subtotal		0.55	3.42	3.97
Dalmatian Pelican	Akköy	0.00	0.06	0.06
Subtotal		0.00	0.06	0.06
Eleonora's Falcon	Armutçuk	0.00	0.07	0.07
	Dampınar	0.00	0.48	0.48
	Hacıhıdırlar	0.00	0.04	0.04
	Harmancık	0.00	0.02	0.02
	Ihlamur	0.04	0.65	0.69
	Kestanederesi	0.00	0.35	0.35
	Ovacık	0.00	0.01	0.01
	Uygar	0.00	0.02	0.02
Subtotal		0.04	1.64	1.68
Eurasian Hobby	Ihlamur	0.00	0.06	0.06
	Ovacık	0.00	0.00	0.00
	Uygar	0.01	0.00	0.01
Subtotal		0.01	0.06	0.07
Eurasian Kestrel	Akköy	0.00	0.05	0.05
	Armutçuk	0.00	0.03	0.03
	Dampınar	0.01	0.00	0.01
	Hacıhıdırlar	0.00	0.02	0.02
	Harmancık	0.00	0.00	0.00
	Ihlamur	0.00	0.74	0.74
	Kestanederesi	0.00	1.06	1.06
	Ovacık	0.00	0.01	0.01
	Uygar	0.01	0.10	0.11
Subtotal		0.02	2.01	2.03
Eurasian Marsh-Harrier	Akköy	0.00	0.00	0.00
	Ihlamur	0.01	0.00	0.01
	Kestanederesi	0.03	0.00	0.03
	Ovacık	0.01	0.00	0.01
Subtotal		0.05	0.00	0.05
Eurasian Sparrowhawk	Akköy	0.00	0.04	0.04
	Armutçuk	0.01	0.04	0.05
	Dampınar	0.03	0.03	0.06
	Hacıhıdırlar	0.00	0.02	0.02
	Harmancık	0.02	0.00	0.02
	Ihlamur	0.03	0.02	0.05
	Kestanederesi	0.03	0.00	0.03
	Ovacık	0.02	0.01	0.03
	Uygar	0.30	0.05	0.35
Subtotal		0.44	0.21	0.65
European Honey-buzzard	Armutçuk	0.02	0.04	0.06
	Dampınar	0.01	0.01	0.02
	Harmancık	0.01	0.00	0.01
	Ihlamur	0.01	0.06	0.07
	Kestanederesi	0.11	0.00	0.11
	Uygar	0.04	0.04	0.08
Subtotal		0.20	0.15	0.35
Hen Harrier	Ihlamur	0.01	0.00	0.01
Subtotal		0.01	0.00	0.01
Lesser Kestrel	Kestanederesi	0.00	1.91	1.91
Subtotal		0.00	1.91	1.91
Levant Sparrowhawk	Harmancık	0.00	0.00	0.00
	Uygar	0.02	0.00	0.02
Subtotal		0.02	0.00	0.02
Long-legged Buzzard	Akköy	0.01	0.01	0.02
	Dampınar	0.00	0.00	0.00
	Kestanederesi	0.00	0.28	0.28
Long-legged Buzzard Total		0.01	0.29	0.30
Montagu's Harrier	Akköy	0.00	0.00	0.00
	Dampınar	0.01	0.00	0.01
	Kestanederesi	0.01	0.00	0.01
Subtotal		0.02	0.00	0.02
Peregrine Falcon	Dampınar	0.00	0.00	0.00
	Kestanederesi	0.00	0.04	0.04
Peregrine Falcon Total		0.00	0.04	0.04
Red-footed Falcon	Ihlamur	0.01	0.00	0.01
Red-footed Falcon Total		0.01	0.00	0.01
Short-toed Snake-Eagle	Akköy	0.03	0.15	0.18
	Armutçuk	0.01	0.04	0.05
	Dampınar	0.00	0.73	0.73
	Hacıhıdırlar	0.00	0.02	0.02
	Harmancık	0.00	0.01	0.01
	Ihlamur	0.04	0.46	0.50
	Kestanederesi	0.00	0.44	0.44
	Ovacık	0.01	0.03	0.04
	Uygar	0.00	0.54	0.54
Subtotal		0.09	2.42	2.51
unidentified Falcon	Harmancık	0.00	0.00	0.00
	Uygar	0.01	0.00	0.01
Subtotal		0.01	0.00	0.01
White Stork	Akköy	0.01	0.17	0.18
Subtotal		0.01	0.17	0.18
Total		1.52	12.45	13.97

4.4.5 Breeding Bird Observations

The survey recorded a total of 61 bird species. Among these, 55 species have a breeding code, indicating active breeding. Notably, the vulnerable European Turtle-Dove (*Streptopelia turtur*) and the near-threatened Woodchat Shrike (*Lanius senator*) were recorded. The most common species observed were the Common Wood-Pigeon (*Columba palumbus),* Common Chaffinch (*Fringilla coelebs*), and European Bee-eater (*Merops apiaster*). Significant observations also include the Eurasian Jay (*Garrulus glandarius*), Common Raven (*Corvus corax*), and Great Tit (*Parus major*). Additionally, species observed during breeding bird surveys which are not breeding were included (denoted -) All species are listed in Table 4-38.

Table 4-38 List of species encountered during breeding bird surveys and highest number recorded each month. (X: observed but not counted).

Common Name	Scientific Name	IUCN	Code	Apr	May	Jun	Jul
Common Wood-Pigeon	*Columba palumbus*	LC	B4	14	12	13	13
European Turtle-Dove	*Streptopelia turtur*	VU	B4	2	4	5	8
Eurasian Collared-Dove	*Streptopelia decaocto*	LC	B4	2	2	-	2
Common Cuckoo	*Cuculus canorus*	LC	A2	1	1	-	-
Alpine Swift	*Tachymarptis melba*	LC	A1	-	-	1	9
Common Swift	*Apus apus*	LC	A1	-	25	7	16
Black Stork	*Ciconia nigra*	LC	B4	1	2	2	1
White Stork	*Ciconia ciconia*	LC	B4	-	7	1	1
European Honey-buzzard	*Pernis apivorus*	LC	A1	-	-	-	X
Short-toed Snake-Eagle	*Circaetus gallicus*	LC	B4	X	X	3	3
Eurasian Sparrowhawk	*Accipiter nisus*	LC	A1	X	X	-	X
Eurasian goshawk	*Astur gentilis*	LC	A1	1	1	-	-
Common Buzzard	*Buteo buteo*	LC	B4	X	X	4	3
Long-legged Buzzard	*Buteo rufinus*	LC	-	X	X	-	-
Tawny Owl	*Strix aluco*	LC	-	-	1	-	-
Eurasian Hoopoe	*Upupa epops*	LC	B4	1	2	2	2
European Bee-eater	*Merops apiaster*	LC	B4	20	50	1	-
Middle Spotted Woodpecker	*Dendrocoptes medius*	LC	B4	3	3	5	2
Great Spotted Woodpecker	*Dendrocopos major*	LC	B4	-	-	-	1
Syrian Woodpecker	*Dendrocopos syriacus*	LC	B4	2	2	3	1
Eurasian Kestrel	*Falco tinnunculus*	LC	A1	1	X	-	X
Eleonora's Falcon	*Falco eleonorae*	LC	A1	-	X	X	8
Peregrine Falcon	*Falco peregrinus*	LC	A1	1	X	X	X
Woodchat Shrike	*Lanius senator*	NT	B4	4	2	2	1
Eurasian Jay	*Garrulus glandarius*	LC	B4	6	8	5	5
Hooded Crow	*Corvus cornix*	LC	-	4	-	5	-
Common Raven	*Corvus corax*	LC	B4	15	4	15	8
Coal Tit	*Periparus ater*	LC	A2	4	-	1	2
Sombre Tit	*Poecile lugubris*	LC	B4	2	2	2	-
Eurasian Blue Tit	*Cyanistes caeruleus*	LC	B4	8	10	4	3
Great Tit	*Parus major*	LC	C12	15	7	13	3
Wood Lark	*Lullula arborea*	LC	B3	2	2	4	-
Crested Lark	*Galerida cristata*	LC	B4	2	4	3	2

Common Name	Scientific Name	IUCN	Code	Apr	May	Jun	Jul
Eastern Olivaceous Warbler	*Iduna pallida*	LC	A2	-	1	-	-
Barn Swallow	*Hirundo rustica*	LC	B4	5	7	50	20
Common House-Martin	*Delichon urbicum*	LC	B4	-	-	18	4
European red-rumped swallow	*Cecropis rufula*	LC	B4	14	8	20	3
Eastern Bonelli's Warbler	*Phylloscopus orientalis*	LC	A2	1	-	-	-
Common Chiffchaff	*Phylloscopus collybita*	LC	A2	1	1	-	-
Long-tailed Tit	*Aegithalos caudatus*	LC	A2	4	-	5	-
Lesser Whitethroat	*Curruca curruca*	LC	A2	3	-	-	-
Eastern Orphean Warbler	*Curruca crassirostris*	LC	B4	1	2	-	1
Rüppell's Warbler	*Curruca ruppeli*	LC	B4	6	3	1	-
Eastern Subalpine Warbler	*Curruca cantillans*	LC	A2	3	-	1	-
Greater Whitethroat	*Curruca communis*	LC	A2	1	1	-	-
Krüper's Nuthatch	*Sitta krueperi*	LC	B4	2	-	4	-
Short-toed Treecreeper	*Certhia brachydactyla*	LC	B4	-	-	1	-
Eurasian Wren	*Troglodytes troglodytes*	LC	A2	1	-	-	-
Mistle Thrush	*Turdus viscivorus*	LC	B4	-	-	2	-
Eurasian Blackbird	*Turdus merula*	LC	B4	11	7	6	9
Common Nightingale	*Luscinia megarhynchos*	LC	B4	2	-	4	1
European Stonechat	*Saxicola rubicola*	LC	C12	-	-	-	2
Northern Wheatear	*Oenanthe oenanthe*	LC	-	2	-	-	-
Eastern Black-eared Wheatear	*Oenanthe melanoleuca*	LC	C14	4	1	1	-
House Sparrow	*Passer domesticus*	LC	-	-	2	-	-
Spanish Sparrow	*Passer hispaniolensis*	LC	A2	105	-	-	-
Common Chaffinch	*Fringilla coelebs*	LC	B4	8	4	15	2
European Greenfinch	*Chloris chloris*	LC	B4	4	3	9	-
European Goldfinch	*Carduelis carduelis*	LC	B4	15	4	5	-
European Serin	*Serinus serinus*	LC	A2	4	13	2	-
Black-headed Bunting	*Emberiza melanocephala*	LC	B4	-	1	-	-
Corn Bunting	*Emberiza calandra*	LC	B4	4	2	-	-
Cirl Bunting	*Emberiza cirlus*	LC	C12	3	3	3	3

4.5 Bat

Spring

Based on Auto-ID results, a total of 85,894 recordings were made. 5,189 recordings, or 6.04%, identified as bat recordings in spring. Noise accounted for the majority of the recordings (93.96%), with an average nightly noise percentage ranging from 69.99% to 97.42%. All nights analysed manually, and summary is shown on Table 4-39.

Table 4-39 Number of bat recordings and noise recorded each night based on Auto-ID in spring

Night	Detectors	Bat	Noise	Total	Noise Ratio	Analysis
1	8	281	6488	6769	95.85%	Manual_ID
2	8	159	1134	1293	87.70%	Manual_ID
3	8	203	1666	1869	89.14%	Manual_ID
4	8	1190	2776	3966	69.99%	Manual_ID
5	8	515	17538	18053	97.15%	Manual_ID
6	8	788	7879	8667	90.91%	Manual_ID
7	8	296	4635	4931	94.00%	Manual_ID
8	8	308	11638	11946	97.42%	Manual_ID
9	8	517	13522	14039	96.32%	Manual_ID
10	8	483	8011	8494	94.31%	Manual_ID
11	8	200	4077	4277	95.32%	Manual_ID
12	8	249	1341	1590	84.34%	Manual_ID
Total	-	5189	80705	85894	93.96%	-

Table 4-40 presents the distribution of bat recordings across 7 SPs based on Manual-ID results. SP03 had the highest average recordings, followed by SP05 and SP07. Night 4 recorded the highest bat activity (1018), 20.6 times the average value, showing the highest potential of the site.

Recorder failures are denoted by blank cells, and due to a malfunctioning SIM card in the detector at SP06, its results were excluded.

Table 4-40 Distribution of bat recordings across SPs by night based on Manual-ID results in spring

Night	SP01	SP02	SP03	SP04	SP05	SP07	SP08	Total
1	27	46	117	20	11	10	7	238
2	4	6	0	2	3	1	8	24
3	15	24	18	14	6	15	4	96
4	64	106	222	106	192	261	67	1018
5	10	13	194	20	80	48	17	382
6	80	113	78	77	90	198	106	742
7	25	28	50	19	34	56	8	220
8	1	15	47	75	75	31	4	248
9	4	15	61	56	136	48	16	336
10		23	58	93	133	40	11	358
11			39	53	30	13	10	145
12			23	37	61	0	79	200
Total	230	389	907	572	851	721	337	4007

Night	SP01	SP02	SP03	SP04	SP05	SP07	SP08	Total
Average	25.6	38.9	75.6	47.7	70.9	60.1	28.1	49.5

Table 4-41 summarizes the results of the Manual-ID analysis of bat recordings for all nights, yielding a total of 4,007 recordings across 7 SPs over 12 nights. Overall, the number of recordings identified through Manual-ID closely aligns with those identified through Auto-ID, with a difference of approximately 5.1%. However, in some instances, noise was misclassified as bat calls by one detector, widening the discrepancy. Ultimately, the total number of bat recordings identified through Manual-ID corresponds to 77.28% of the total results from Auto-ID for spring.

Table 4-41 Number of bat recordings per night with Manual -ID results in spring

Night	SP01	SP02	SP03	SP04	SP05	SP07	SP08	Total
1	32	53	123	40	11	11	11	281
2	7	9	0	81	32	12	15	156
3	21	25	25	65	30	21	16	203
4	65	106	232	237	211	268	71	1190
5	28	13	194	86	103	45	46	515
6	84	118	78	88	107	206	107	788
7	31	73	53	25	47	56	11	296
8	5	43	46	76	91	42	5	308
9	5	136	72	68	171	48	17	517
10	0	31	81	106	149	50	65	482
11	0	0	45	58	61	18	18	200
12	0	0	30	55	65	0	99	249
Total	278	607	979	985	1078	777	481	5189

The Auto-ID analysis of bat recordings across all nights reveals that the most common species was Common Pipistrelle (*Pipistrellus pipistrellus*), accounting for 48.49% of the total recordings, and 61.13% when non-identified species were distributed evenly (Table 4-42).The second most common species was European Free-tailed Bat (*Tadarida teniotis*), representing 11.76% of the total recordings, and 14.82% when non-identified species were distributed evenly. The presence of Vulnerable (VU) species, such as Schreiber's Bent-wing Bat (*Miniopterus schreibersii*) and Giant Noctule (*Nyctalus lasiopterus*) is noteworthy.

The software failed to identify more than 20.68% of the recordings.

Table 4-42 Bat groups and species recorded during selected nights at each SP based on Auto-ID in spring

Group	Species	IUCN	SP01	SP02	SP03	SP04	SP05	SP07	SP08	Total	Percent	Percent_2
Pipistrelloid	PIPPIP	LC	116	157	751	330	539	458	165	2516	48.49%	61.13%
Pipistrelloid	MINSCH	VU	9	24	13	35	189	97	12	379	7.30%	9.21%
Pipistrelloid	PIPKUH	LC	3	110	4	9	1	2	33	162	3.12%	3.94%
Pipistrelloid	PIPNAT	LC	6	15	6	6	1	4	19	57	1.10%	1.38%
Pipistrelloid	PIPPYG	LC	1	1	10	12	0	20	7	51	0.98%	1.24%
Pipistrelloid	HYPSAV	LC	2	1	0	34	1	3	3	44	0.85%	1.07%
Nyctaloid	EPTSER	LC	3	13	3	38	7	1	9	74	1.43%	1.80%
Nyctaloid	NYCNOC	LC	3	8	9	27	3	4	2	56	1.08%	1.36%

Group	Species	IUCN	SP01	SP02	SP03	SP04	SP05	SP07	SP08	Total	Percent	Percent_2
Nyctaloid	NYCLEI	LC	0	5	1	16	0	0	0	22	0.42%	0.53%
Nyctaloid	NYCLAS	VU	0	5	3	0	0	4	2	14	0.27%	0.34%
Tadarida	TADTEN	LC	71	135	51	196	72	19	66	610	11.76%	14.82%
Plecotus	PLESPE	NA	0	1	3	3	1	2	1	11	0.21%	0.27%
Myotis	MYOSPE	NA	9	5	7	2	5	7	11	46	0.89%	1.12%
Rhinolophus	RHIHIP	NT(E,M)	4	1	38	0	6	9	8	66	1.27%	1.60%
Rhinolophus	RHIFER	NT(E,M)	0	1	2	0	0	2	2	7	0.13%	0.17%
Rhinolophus	RHIEUR	VU(E,M)	0	0	0	0	0	0	1	1	0.02%	0.02%
-	NoID	-	52	125	81	277	253	145	140	1073	20.68%	
Total	-	-	279	607	982	985	1078	777	481	5189	-	-

When checking the manual ID species of 4,007 records in total, we can see some differences compared to the Auto ID data (Table 4-43). Firstly, the most common species, Common Pipistrelle (Pipistrellus pipistrellus) accounted for 48.49% of the total in Auto-ID (2,516 records) compared to 69.25% in Manual-ID (2,775 records), showing a higher detection rate in Manual-ID. Secondly, European Free-tailed Bat (*Tadarida teniotis*) accounted for 11.76% in Auto-ID (610 records) compared to 6.14% in Manual-ID (246 records), indicating that Auto-ID overestimated this species. Lastly, Schreiber's Bent-winged Bat (*Miniopterus schreibersii*) was detected in 7.30% of Auto-ID (379 records), while Manual-ID identified 12.63% (506 records), highlighting a significant underestimation in Auto-ID.

Table 4-43 Bat groups and species recorded during selected nights at each SP based on Manual ID in spring

Group	Species	IUCN	SP01	SP02	SP03	SP04	SP05	SP07	SP08	Total	Percent
Pipistrelloid	PIPPIP	LC	126	161	762	421	616	478	211	2775	69.25%
Pipistrelloid	MINSCH	VU	12	38	17	74	189	175	1	506	12.63%
Pipistrelloid	PIPPYG	LC	1	0	9	0	3	19	11	43	1.07%
Pipistrelloid	PIPKUH/PIPNAT	-	1	33	0	0	0	0	0	34	0.85%
Pipistrelloid	PIPNAT	LC	10	0	0	1	1	0	16	28	0.70%
Pipistrelloid	HYPSAV	LC	1	3	0	3	0	0	0	7	0.17%
Nyctaloid	EPTSER	LC	6	10	3	6	3	1	2	31	0.77%
Nyctaloid	NYCLAS	VU	0	12	1	0	0	0	3	16	0.40%
Nyctaloid	NYCLEI	LC	0	4	3	0	0	0	0	7	0.17%
Tadarida	TADTEN	LC	52	107	25	38	14	0	10	246	6.14%
Plecotus	PLESPE	NA	1	5	6	5	0	0	1	18	0.45%
Myotis	MYOSPE	NA	16	13	14	6	15	8	11	83	2.07%
Rhinolophus	RHIHIP	NT(E ,M)	4	2	50	0	6	12	6	80	2.00%
Rhinolophus	RHIFER	NT(E ,M)	0	1	1	3	4	13	4	26	0.65%
Rhinolophus	RHIBLA	VU (E)	0	0	0	0	0	6	9	15	0.37%
-	KUHLII/PIPNAT	-	0	0	0	0	0	9	52	61	1.52%

Group	Species	IUCN	SP01	SP02	SP03	SP04	SP05	SP07	SP08	Total	Percent
-	PIPISTRELLUS NATHUSII/KUHLII	-	0	0	16	15	0	0	0	31	0.77%
Total	-	-	230	389	907	572	851	721	337	4007	-

The bat activity during the hours of the night was analyzed for Pipistrelloid, Nyctaloid, and Tadarida groups, as they are known to be high and middle altitude fliers[12], making them potential subjects to possible curtailment planning. Figure 4-3 represents the activity patterns of these selected species throughout the night during the spring season, spanning from 19:00 to 06:00.

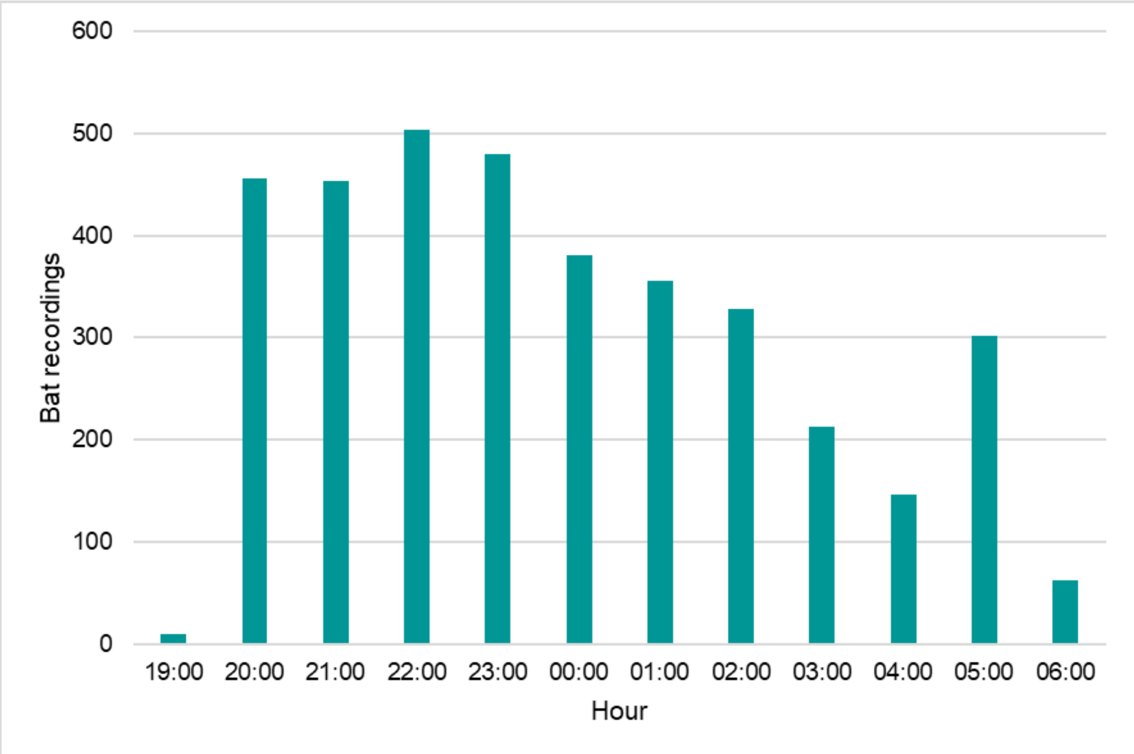

Figure 4-3 Hourly distribution of bat recordings through the night in spring

Summer

Based on Auto-ID results, a total of 55,155 recordings were made (Table 4-44). 20,200 recordings, or 36.58%, were identified as bat recordings in summer. Noise accounted for the majority of the recordings (34,955 or 63.38%), with an average nightly noise percentage ranging from 34.03% to 72.97%.

Nights 3 and 4 were selected for manual species identification.

[12] Rodrigues L., Bach L., Dubourg-Savage M.J., Karapandža B., Kovač D., Kervyn T., ... and Mindermann J. (2014). Guidelines for consideration of bats in wind farm projects, Revision 2014. EUROBATS Publication Series No. 6. Bonn: UNEP/EUROBATS Secretariat.

Table 4-44 Number of bat recordings and noise recorded each night based on Auto-ID in summer

Night	Detectors	Bat	Noise	Total	Noise Ratio	Analysis
1	8	2585	6934	9519	72.84%	
2	8	2311	6240	8551	72.97%	
3	8	2464	5393	7857	68.64%	Manual_ID
4	8	2625	4860	7485	64.93%	Manual_ID
5	8	2679	3993	6672	59.85%	
6	8	1381	1463	2844	51.44%	
7	8	1614	2361	3975	59.40%	
8	8	1508	1726	3234	53.37%	
9	8	1316	970	2286	42.43%	
10	8	1167	602	1769	34.03%	
11	8	550	413	963	42.89%	
Total	-	20200	34955	55155	63.38%	-

Table 4-45 presents the distribution of bat recordings across 8 SPs based on Auto-ID results. SP08 had the highest average recordings, followed by SP06 and SP05. Night 5 recorded the highest bat activity (2,679), which is 17.2 times the average value, showing the highest potential of the site. Recorder failures are denoted by blank cells in the table.

Table 4-45 Distribution of bat recordings across SPs by night based on Auto-ID results in summer

Night	SP01	SP02	SP03	SP04	SP05	SP06	SP07	SP08	Total
1	137	98	280	182	325	751	175	637	2585
2	36	46	343	201	272	637	151	625	2311
3	137	35	288	95	308	642	102	857	2464
4	39	67	238	110	278	52L6	90	1277	2625
5	52	124	189	175	386	793	113	847	2679
6	18	62		143	375	433	342	8	1381
7	40	18		80	340	1011	125		1614
8	78	147		107	300	649	227		1508
9	15	45		52	152	938	114		1316
10		17		39	259	756	96		1167
11		1		31	74	327	117		550
Average	61	60	268	110	279	678	150	708	289
Average_corrected	33	32	143	59	149	362	80	378	155

Table 4-46 and Table 4-47 summarizes the results of the Manual-ID analysis of bat recordings for the selected nights, yielding a total of 2,718 recordings across 8 SPs over two nights. Consequently, the total number of bat recordings identified through Manual-ID corresponds to 53.4% of the total results from Auto-ID for summer.

Table 4-46 Distribution of bat recordings across SPs by selected nights based on Manual-ID results in summer

Night	Method	SP01	SP02	SP03	SP04	SP05	SP06	SP07	SP08	Total
3	Manual ID	19	24	80	84	335	745	105	5	1397
4	Manual ID	27	5as9	192	113	284	555	89	2	1321
Total	Manual ID	46	83	272	197	619	1300	194	7	2718

Table 4-47 Distribution of bat recordings across SPs by selected nights based on Auto-ID results in summer

Night	Method	SP01	SP02	SP03	SP04	SP05	SP06	SP07	SP08	Total
3	Auto ID	137	35	288	95	308	642	102	857	2464
4	Auto ID	39	67	238	110	278	526	90	1277	2625
Total	Auto ID	176	102	526	205	586	1168	192	2134	5089

Based on the Auto-ID results, the most common species recorded was Common Pipistrelle (*Pipistrellus pipistrellus*), with 32.62% of the recordings, and 55.62% of recordings when non-identified species are distributed evenly (Table 4-48). Thesecond most common species was Serotine Bat (*Eptesicus serotinus*), with 14.59% of the recordings and 24.87% when non-identified species are distributed evenly.

It is notable the presence of Vulnerable (VU) species such as Schreiber's Bent-wing Bat (*Miniopterus schreibersii*) and Giant Noctule (*Nyctalus lasiopterus*).

The software failed to identify more than 41.34% of the recordings.

Table 4-48 Bat groups and species recorded during selected nights at each SP based on Auto-ID in summer

Group	Species	IUCN	SP01	SP02	SP03	SP04	SP05	SP06	SP07	SP08	Total	Percent	Percent_2
Pipistrelloid	PIPPIP	LC	122	435	382	686	1693	2155	999	118	6590	32.62%	55.62%
Pipistrelloid	MINSCH	VU	4	11	14	127	351	98	40	3	648	3.21%	5.47%
Pipistrelloid	PIPPYG	LC	8	28	9	30	14	15	123	371	598	2.96%	5.05%
Pipistrelloid	PIPKUH	LC	63	15	23	14	119	44	31	14	323	1.60%	2.73%
Pipistrelloid	PIPNAT	LC	11	16	41	24	74	89	26	10	291	1.44%	2.46%
Pipistrelloid	HYPSAV	LC	1	5	3	9	7	16	6	2	49	0.24%	0.41%
Nyctaloid	EPTSER	LC	0	2	6	20	73	2819	23	4	2947	14.59%	24.87%
Nyctaloid	NYCLEI	LC	0	0	4	2	4	110	3	0	123	0.61%	1.04%
Nyctaloid	NYCNOC	LC	8	2	3	2	3	8	2	0	28	0.14%	0.24%
Nyctaloid	VESMUR	LC	1	0	2	0	0	20	0	1	24	0.12%	0.20%
Nyctaloid	NYCLAS	VU	2	0	0	1	0	0	0	0	3	0.01%	0.03%
Tadarida	TADTEN	LC	5	2	0	1	1	0	0	0	9	0.04%	0.08%
Plecotus	PLESPE	NA	0	0	2	1	0	8	2	0	13	0.06%	0.11%
Myotis	MYOSPE	NA	5	7	10	14	16	20	46	19	137	0.68%	1.16%
Rhinolophus	RHIFER	NT(E,M)	0	1	20	0	2	0	3	1	27	0.13%	0.23%
Rhinolophus	RHIHIP	NT(E,M)	6	4	1	0	0	1	2	6	20	0.10%	0.17%
Rhinolophus	RHIEUR	VU(E,M)	0	0	0	0	3	5	0	0	8	0.04%	0.07%
Barbastella	BARBAR	VU (E)	0	1	2	0	1	4	1	2	11	0.05%	0.09%
-	NoID	-	316	131	816	284	708	2051	345	3700	8351	41.34%	
Total	-	-	552	660	1338	1215	3069	7463	1652	4251	20200	-	-

Compared to the Auto-ID results, there are some differences with Manual-ID species for a total of 2718 records (Table 4-49). For the Common Pipistrelle (*Pipistrellus pipistrellus*), the Manual-ID results indicate that this species constituted 45.25% of the total recordings, whereas in the Auto-ID results, it accounted for 32.62%. This demonstrates a noticeable increase in the Manual-ID results, suggesting that this species was more accurately identified manually.

Regarding the Serotine Bat (*Eptesicus serotinus*), the Manual-ID results show a representation of 29.87%, while the Auto-ID results indicate 14.59%. This significant discrepancy suggests that the Auto-ID system may have missed or misclassified some recordings of this species.

Lastly, in the Manual-ID results of Schreiber's Bent-wing Bat (*Miniopterus schreibersii*) made up 10.01% of the total, while in the Auto-ID results, it was listed with a much lower percentage, 5.47%. This reflects a substantial difference in identification rates, possibly due to the software's limitations in distinguishing this species accurately.

Table 4-49 Bat groups and species recorded during selected nights at each SP based on Manual ID in summer

Group	Species	IUCN	SP01	SP02	SP03	SP04	SP05	SP06	SP07	SP08	Total	Percent
Pipistrelloid	PIPPIP	LC	27	53	188	124	304	408	126	0	1230	45.25%
Pipistrelloid	MINSCH	VU	3	4	7	38	144	56	19	1	272	10.01%
Pipistrelloid	PIPKUH/PIPNAT	-	2	6	39	12	108	39	8	0	214	7.87%
Pipistrelloid	PIPPYG	LC	0	11	3	0	6	2	4	0	26	0.96%
Pipistrelloid	HYPSAV	LC	0	4	1	3	0	2	2	0	12	0.44%
Nyctaloid	EPTSER	LC	0	2	2	9	42	754	3	0	812	29.87%
Nyctaloid	NYCLEI	LC	0	0	2	2	2	23	5	0	34	1.25%
Nyctaloid	NYCNOC	LC	0	0	0	1	1	0	1	0	3	0.11%
Tadarida	TADTEN	LC	10	1	0	0	0	0	0	0	11	0.40%
Plecotus	PLESPE	NA	0	0	0	0	2	4	0	0	6	0.22%
Myotis	MYOSPE	NA	2	1	6	8	6	5	23	2	53	1.95%
Rhinolophus	RHIFER	NT(E,M)	0	1	19	0	1	0	1	1	23	0.85%
Rhinolophus	RHIHIP	NT(E,M)	2	0	3	0	0	2	1	3	11	0.40%
Rhinolophus	RHIEUR	VU(E,M)	0	0	0	0	2	2	0	0	4	0.15%
Barbastella	BARBAR	VU (E)	0	0	2	0	1	3	1	0	7	0.26%
Total	-	-	46	83	272	197	619	1300	194	7	2718	-

The bat activity during the hours of the night was analysed for *Pipistrelloid*, *Nyctaloid*, and *Tadarida* groups, as they are known to be high and middle altitude fliers[13], making them potential subjects to possible curtailment planning. Figure 4-4 represents the activity patterns of these selected species throughout the night during the summer season, spanning from 20:00 to 05:00.

[13] Rodrigues L., Bach L., Dubourg-Savage M.J., Karapandža B., Kovač D., Kervyn T., ... and Mindermann J. (2014). Guidelines for consideration of bats in wind farm projects, Revision 2014. EUROBATS Publication Series No. 6. Bonn: UNEP/EUROBATS Secretariat.

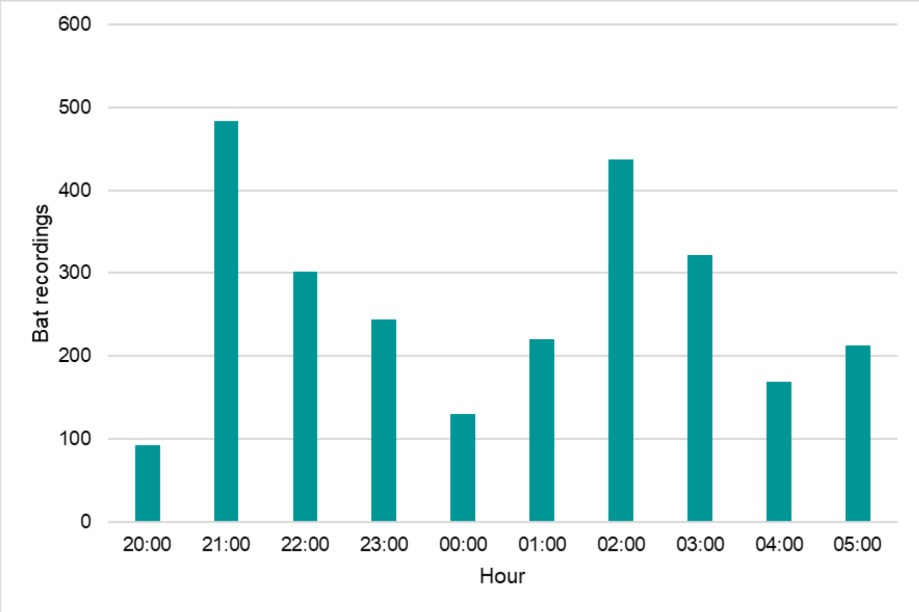

Figure 4-4: Hourly distribution of bat recordings through the night in summer

Autumn

Based on Auto-ID results, a total of 74,438 recordings were made (Table 4-50). 17,472 recordings, or 23.47%, identified as bat recordings in autumn. Noise accounted for the majority of the recordings 76.53%, with an average nightly noise percentage ranging from 55.12% to 95.13%. Nights 1, 2 were selected for manual species identification.

SP06 was excluded from the autumn surveys due to changes in turbine locations. Instead, SP09 and SP10 were added as the roads provide access to the turbine levels.

Table 4-50 Number of bat recordings and noise recorded each night based on Auto-ID in autumn

Night	Detectors	Bat	Noise	Total	Noise Ratio	Analysis
1	9	3665	4502	8167	55.12%	Manual_ID
2	9	2698	6604	9302	71.00%	Manual_ID
3	9	2086	7503	9589	78.25%	
4	9	977	4921	5898	83.44%	
5	9	945	6541	7486	87.38%	
6	9	2888	8275	11163	74.13%	
7	9	1713	6754	8467	79.77%	
8	9	1224	3738	4962	75.33%	
9	9	867	4602	5469	84.15%	
10	9	336	2668	3004	88.81%	
11	9	48	370	418	88.52%	
12	9	25	488	513	95.13%	
Total	-	17472	56966	74438	76.53%	-

Table 4-51 presents the distribution of bat recordings across 9 SPs based on Auto-ID results and recorder failures are denoted by blank cells. SP05 had the highest average recordings, accounting for 1.54 times the average of all detections, followed by SP09 and SP03. Night 1 recorded the highest bat activity (3665 recordings), showing the highest potential of the site.

Table 4-51 Distribution of bat recordings across SPs by night based on Auto-ID results in autumn

Night	SP01	SP02	SP03	SP04	SP05	SP07	SP08	SP09	SP10	Total
1	694	282	402	183	480	250	274	626	474	3665
2	420	191	407	247	479	176	273	295	210	2698
3	326	148	385	154	412	173	212	197	79	2086
4	324	39	102	41	185	57	100	97	32	977
5	15	107	155	69	140	197	143	100	19	945
6	162	168	223	194	525	761		769	86	2888
7	53	94	337	303	243	246		375	62	1713
8	15	88	237	92	325	102		294	71	1224
9	16	51	149	55	284	68		207	37	867
10	6	24	101	29	49			100	27	336
11	22	26								48
12	1	24								25
Average	171	104	250	137	312	226	200	306	110	202

Table 4-52 and Table 4-53 summarizes the results of the Manual-ID analysis of bat recordings for the selected nights (1, 2), yielding a total of 5971 recordings across 9 SPs over two nights. Overall, the number of recordings identified through Manual-ID closely aligns with those identified through Auto-ID, with a difference of approximately 1.44%. However, in some instances, noise was misclassified as bat calls by one detector, widening the discrepancy. Ultimately, the total number of bat recordings identified through Manual-ID corresponds to 98.56% of the total results from Auto-ID for autumn.

Table 4-52 Distribution of bat recordings across SPs by selected nights based on Manual-ID results in autumn

Night	Method	SP01	SP02	SP03	SP04	SP05	SP07	SP08	SP09	SP10	Total
1	Manual ID	835	292	428	182	596	265	201	585	313	3697
2	Manual ID	254	190	436	184	614	182	149	204	61	2274
Total	Manual ID	1089	482	864	366	1210	447	350	789	374	5971

Table 4-53 Distribution of bat recordings across SPs by selected nights based on Auto-ID results in autumn

Night	Method	SP01	SP02	SP03	SP04	SP05	SP07	SP08	SP09	SP10	Total
1	Auto ID	694	282	402	183	480	250	274	626	474	3665
2	Auto ID	420	191	407	247	479	176	273	295	210	2698
Total	Auto ID	1114	473	809	430	959	426	547	921	684	6363

The Auto-ID analysis of bat sounds from all nights shows that the most common species was Common Pipistrelle (*Pipistrellus pipistrellus*), accounting for 38.90% of the recordings, increasing to 57.54% when unidentified species are distributed evenly (Table 4-54). The second most common species was Nathusius' Pipistrelle (*Pipistrellus nathusii*), which constituted 8.65% of the recordings, or 12.79% when unidentified species are distributed evenly.

Species classified as Vulnerable (VU), including Schreiber's Bent-winged Bat (*Miniopterus schreibersii*), represented 2.75% of the total recordings (4.06% when unidentified species are distributed). The software failed to identify 32.39% of the recordings.

Table 4-54 Bat groups and species recorded during selected nights at each SP based on Auto-ID in autumn

Group	Species	IUCN	SP01	SP02	SP03	SP04	SP05	SP07	SP08	SP09	SP10	Total	Percent	Percent_2
Pipistrelloid	PIPPIP	LC	541	477	1545	444	1151	506	266	1426	441	6797	38.90%	57.54%
Pipistrelloid	PIPNAT	LC	331	148	250	310	79	115	110	121	47	1511	8.65%	12.79%
Pipistrelloid	PIPKUH	LC	350	192	208	99	66	188	66	127	25	1321	7.56%	11.18%
Pipistrelloid	MINSCH	VU	28	49	31	25	176	49	19	84	19	480	2.75%	4.06%
Pipistrelloid	PIPPYG	LC	16	48	10	1	10	45	5	2	0	137	0.78%	1.16%
Pipistrelloid	HYPSAV	LC	12	9	8	5	3	2	6	3	6	54	0.31%	0.46%
Nyctaloid	NYCNOC	LC	4	4	7	8	3	5	14	1	22	68	0.39%	0.58%
Nyctaloid	EPTSER	LC	4	12	6	2	1	2	1	17	12	57	0.33%	0.48%
Nyctaloid	NYCLAS	VU	0	0	3	2	1	0	1	32	0	39	0.22%	0.33%
Nyctaloid	NYCLEI	LC	2	3	1	7	1	4	1	8	1	28	0.16%	0.24%
Nyctaloid	VESMUR	LC	0	0	3	2	4	1	4	1	3	18	0.10%	0.15%
Tadarida	TADTEN	LC	14	11	8	11	78	11	26	350	238	747	4.28%	6.32%
Plecotus	PLESPE	NA	0	0	61	5	280	3	1	5	2	357	2.04%	3.02%
Myotis	MYOSPE	NA	3	5	1	1	2	3	3	6	3	27	0.15%	0.23%
Rhinolophus	RHIHIP	NT(E,M)	23	22	1	6	12	73	4	0	0	141	0.81%	1.19%
Rhinolophus	RHIEUR	VU(E,M)	0	0	0	0	11	0	0	0	0	11	0.06%	0.09%
Rhinolophus	RHIFER	NT(E,M)	0	1	3	2	0	1	0	0	1	8	0.05%	0.07%
Barbastella	BARBAR	VU (E)	3	0	1	1	0	1	3	2	0	11	0.06%	0.09%
-	NoID	-	723	261	351	436	1244	1021	472	875	277	5660	32.39%	
Total	-	-	2054	1242	2498	1367	3122	2030	1002	3060	1097	17472	-	-

Compared to the Auto-ID results, there are some differences with Manual-ID species for a total of 5597 records (Table 4-55). Common Pipistrelle (Pipistrellus pipistrellus) remains the most frequently recorded species in both methods. However, its relative proportion is higher in Manual-ID (58.23%) compared to Auto-ID (38.82%). This indicates that Manual-ID may better capture the predominance of this species or exclude misclassified recordings.

Schreiber's Bent-winged Bat (*Miniopterus schreibersii*, VU) shows a higher proportion in Manual-ID (3.43%) compared to Auto-ID (2.75%). *Plecotus spec.* shows a higher proportion in Manual-ID (7.15%) compared to Auto-ID (3.02%).

Table 4-55 Bat groups and species recorded during selected nights at each SP based on Manual ID in autumn

Group	Species	IUCN	SP01	SP02	SP03	SP04	SP05	SP07	SP08	SP09	SP10	Total	Percent
Pipistrelloid	PIPPIP	LC	542	262	514	192	751	231	196	517	272	3477	58.23%
Pipistrelloid	PIPKUH/PIPNAT	-	507	153	247	147	73	152	112	173	52	1616	27.06%
Pipistrelloid	MINSCH	VU	16	22	4	9	36	32	19	55	12	205	3.43%
Pipistrelloid	HYPSAV	LC	3	5	5	3	0	2	6	0	6	30	0.50%
Pipistrelloid	PIPPYG	LC	8	2	1	0	2	5	1	2	2	23	0.39%
Nyctaloid	EPTSER	LC	1	19	2	2	2	2	1	16	10	45	0.83%
Nyctaloid	NYCLEI	LC	1	6	5	5	1	5	5	4	4	36	0.60%
Nyctaloid	NYCLAS	VU	0	1	3	2	6	1	0	0	0	13	0.22%
Nyctaloid	NYCNOC	LC	0	0	1	0	0	0	0	0	0	1	0.02%
Tadarida	TADTEN	LC	9	6	3	1	14	4	1	0	16	54	0.90%
Plecotus	PLESPE	NA	0	0	76	4	325	8	3	11	0	427	7.15%
Myotis	MYOSPE	NA	0	3	1	0	0	1	2	11	0	18	0.30%
Rhinolophus	RHIHIP	NT(E,M)	2	3	0	0	0	3	2	0	0	10	0.17%
Rhinolophus	RHIFER	NT(E,M)	0	0	1	1	0	0	0	0	0	2	0.03%
Rhinolophus	RHIBLA	VU (E)	0	0	0	0	0	0	1	0	0	1	0.02%
Barbastella	BARBAR	VU (E)	0	0	1	0	0	1	1	5	0	8	0.13%
Total	-	-	1089	482	864	366	1210	447	350	789	374	5971	-

The bat activity during the hours of the night was analysed for *Pipistrelloid*, *Nyctaloid*, and *Tadarida* groups, as they are known to be high and middle altitude fliers[14], making them potential subjects to possible curtailment planning. Figure 4-5 illustrates the activity patterns of these selected species throughout the night during the autumn season, spanning from 18:00 to 06:00.

[14] Rodrigues L., Bach L., Dubourg-Savage M.J., Karapandža B., Kovač D., Kervyn T., ... and Mindermann J. (2014). Guidelines for consideration of bats in wind farm projects, Revision 2014. EUROBATS Publication Series No. 6. Bonn: UNEP/EUROBATS Secretariat.

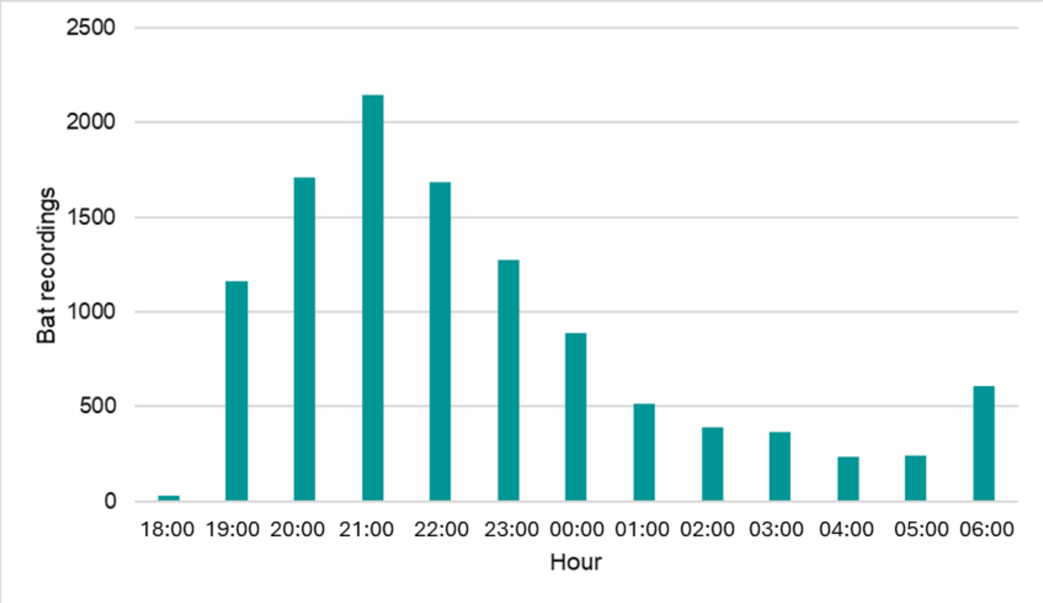

Figure 4-5 Bat groups and species recorded during the hours of the night in autumn

Transect Surveys

Based on transect surveys, a total of 3867 recordings were made. 1598 recordings, or 41.33%, were identified as bat recordings in spring, summer, and autumn. Noise accounted for the majority of the recordings (58.68%), with an average nightly noise percentage ranging from 49.16% to 72.46% (Table 4-56).

Table 4-56 Number of bat recordings and noise recorded each night during transect surveys

Date	Bat	Noise	Total	Noise Ratio
2024-04-20	184	484	668	72.46%
2024-04-30	344	486	830	58.55%
2024-07-20	265	467	732	63.80%
2024-07-27	252	260	512	50.78%
2024-09-20	252	281	533	52.72%
2024-09-21	301	291	592	49.16%
Total	1598	2269	3867	58.68%

The Auto ID of the sounds at all nights shows the most common species was Common Pipistrelle (*Pipistrellus pipistrellus*) with 30.04% of the recordings and 45.37% when non-identified species are distributed evenly. Notably, the second most common species is Noctule (*Nyctalus noctula*) with 25.22% of the recordings and 38.09% when non-identified species are distributed evenly (Table 4-57).

Table 4-57 Bat groups and species recorded during mobile surveys based on Auto-ID results

Group	Species	IUCN	04_M1a	04_M1b	07_M1a	07_M1b	09_M1a	09_M1b	Total	Percent	Percent_2
Pipistrelloid	PIPPIP	LC	3	223	71	104	46	33	480	30.04%	45.37%

Group	Species	IUCN	04_M1a	04_M1b	07_M1a	07_M1b	09_M1a	09_M1b	Total	Percent	Percent_2
Pipistrelloid	MINSCH	VU	0	11	2	20	4	3	40	2.50%	3.78%
Pipistrelloid	PIPNAT	LC	1	8	9	2	6	1	27	1.69%	2.55%
Pipistrelloid	PIPKUH	LC	0	6	7	3	1	0	17	1.06%	1.61%
Pipistrelloid	PIPPYG	LC	1	0	2	1	0	0	4	0.25%	0.38%
Pipistrelloid	HYPSAV	LC	0	0	0	0	2	1	3	0.19%	0.28%
Nyctaloid	NYCNOC	LC	68	40	77	51	69	98	403	25.22%	38.09%
Nyctaloid	NYCLEI	LC	10	0	10	4	4	18	46	2.88%	4.35%
Nyctaloid	VESMUR	LC	3	1	2	0	4	1	11	0.69%	1.04%
Nyctaloid	EPTSER	LC	0	1	10	0	0	0	11	0.69%	1.04%
Nyctaloid	NYCLAS	VU	1	1	0	0	1	1	4	0.25%	0.38%
Tadarida	TADTEN	LC	0	0	2	1	0	1	4	0.25%	0.38%
Plecotus	PLESPE	NA	0	0	0	1	2	3	6	0.38%	0.57%
Myotis	MYOSPE	NA	0	0	1	0	0	1	2	0.13%	0.19%
-	NoID	-	97	53	72	65	113	140	540	33.79%	
Total	-	-	184	344	265	252	252	301	1598	-	-

When checking the manual ID of species for 803 records in total, some notable differences emerge compared to the Auto ID results. Common Pipistrelle (*Pipistrellus pipistrellus*) remains the most common species, but its proportion increases significantly from 30.04% in Auto ID to 72.85% in Manual ID. Interestingly, Noctule (*Nyctalus noctula*), the second most common species in Auto ID, is absent from the Manual ID results, indicating a shift in species representation between the two methods. Additionally, *Plecotus species* (*PLESPE*), which accounted for only 0.38% in Auto ID, rises to 4.11% in Manual ID, suggesting differences in detection accuracy or identification approaches (Table 4-58).

Schreiber's Bent-wing Bat (*Miniopterus schreibersii*) which is Vulnerable (VU) in IUCN Red List was recorded during mobile surveys.

Table 4-58 Bat groups and species recorded during transect surveys based on Manual ID results

Group	Species	IUCN	04_M1a	04_M1b	07_M1a	07_M1b	09_M1a	09_M1b	Total	Percent
Pipistrelloid	PIPPIP	LC	3	224	84	132	66	76	585	72.85%
Pipistrelloid	PIPKUH/PIPNAT	-	0	13	23	9	19	4	68	8.47%
Pipistrelloid	MINSCH	VU	0	11	5	31	4	3	54	6.72%
Pipistrelloid	PIPPYG	LC	0	0	0	2	0	1	3	0.37%
Nyctaloid	NYCLEI	LC	5	0	17	4	0	1	27	3.36%
Nyctaloid	EPTSER	LC	0	0	22	0	0	0	22	2.74%
Nyctaloid	VESMUR	LC	0	0	0	0	0	2	2	0.25%
Plecotus	PLESPE	NA	0	0	0	1	4	28	33	4.11%
Myotis	MYOSPE	NA	0	0	4	2	1	1	8	1.00%
Rhinolophus	RHIFER	NT(E,M)	0	0	1	0	0	0	1	0.12%
Total	-	-	8	248	156	181	94	116	803	-

Heat maps are currently available exclusively for the autumn season, as no tracks were recorded during the spring and summer mobile surveys. Consequently, proper data for a comprehensive analysis is lacking. Heat maps are shown on Figure 4-6.

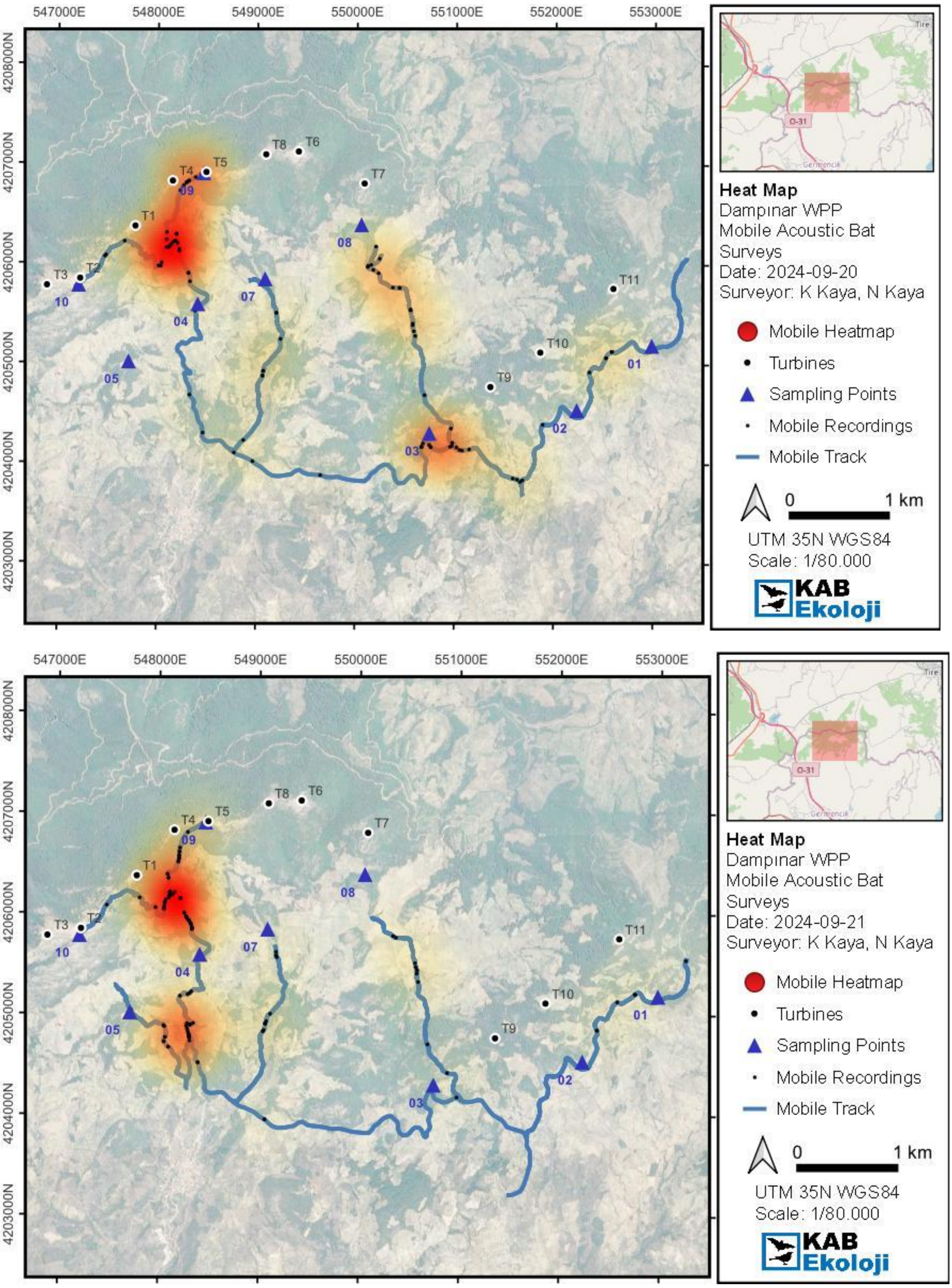

Figure 4-6 Heat maps from transect surveys

5 Discussion

5.1 Flora

- There is no data different from which was identified in the local EIA process for the ETL and access road.
- The *Scutellaria orientalis* were documented in previous studies conducted within EIA Report. This species is very common and largely distributed in Türkiye. It is thought that the subspecies "*Scutellaria orientalis* subsp. *carica*" may spread in the project area and the species was not encountered during field studies. Due to habitat similarities, their presence in the access road and ETL areas is also considered likely, despite the absence of direct observations.
- The population of *Cyclamen hederifolium* in the region is at a very good level. Therefore, no additional action is deemed necessary in 2024. It is recommended to re-evaluate future actions with population monitoring during the operation period

5.2 Terrestrial Mammal

- The sensitivity of the terrestrial fauna within the project area, as assessed in the ESIA, has been categorized as low. Given the mitigation measures outlined in the ESIA, no significant impacts are expected on terrestrial fauna due to the project operational activities. Additionally, the monitoring schedule proposed in BMP will enable the assessment of long-term effects on terrestrial fauna during the operational phase. This monitoring framework will allow for the identification and addressing of any potential ecological disturbances over time. Based on the current evaluation and mitigation strategies, the project is not expected to cause any lasting or significant impact on the terrestrial mammal.
- Two mammal species that may potentially be found in the area and are classified as VU (Vulnerable) by the IUCN, namely *Myomimus roachi*, *Vormela peregusna*. Anatolian Ground Squirrel (*Spermophilus xanthoprymnus*) and Brandt's Hamster (*Mesocricetus brandti*) are Near Threatened (NT). *Capreolus capreolus,* is one of the important mammal species. Although its status is Least Concern, this species is considered to have national importance. All these species have been recorded as literature.
- The monitoring period and frequency for the mammal species: should be conducted annually during the operational phase, specifically for 10 days each in April, May, and June.

5.3 Herpetofauna

- The sensitivity of the herpetofauna, as determined in the ESIA, has been classified as low. With the implementation of the impact mitigation measures outlined in the ESIA, the significance of potential impacts on herpetofauna is considered negligible. Monitoring schedule provided in the BMP will facilitate the assessment of long-term effects on herpetofauna during the operational phase. Based on the available data and the mitigation measures in place, no significant or lasting impacts on herpetofauna are anticipated because of the project.
- Among the reptiles identified in the project area and its surroundings, ıt is recommended to relocate the species *Testudo graeca*, which was detected in the field, Additionally, if the species is identified within the project area, translocation (relocation) efforts should be carried out.

- The ESIA demonstrates that the impacts on herpetofauna are expected to be minor. Moreover, the implementation of the BMP actions will be sufficient to address and mitigate any potential effects.

5.4 Bird

For spring VP surveys, an average of 42 hours has been spent at three vantage points for bird surveys. A total of 158 birds were counted during the observations, comprising 1 migrant bird and 157 resident birds. Among these observed birds, only 76 passed through the risk zone of the wind farm. The collision risk modelling for spring indicated a medium rate of 0.01 and 0.47 collisions for migrant and resident birds, respectively.

For summer VP surveys, an average of 40 hours has been spent at three vantage points for bird surveys. A total of 160 birds were counted during the observations, comprising 1 migrant bird and 159 resident birds. Among these observed birds, only 117 passed through the risk zone of the wind farm. The collision risk modelling for summer indicated a rate of 0.76 for resident birds.

For autumn VP surveys, an average of 46 hours has been spent at three vantage points for bird surveys. A total of 142 birds were counted during the observations, comprising 27 migrant bird (and a rate of about 0.6 birds/hr) and 115 resident birds. Among these observed birds, only 65 passed through the risk zone of the wind farm. The collision risk modelling for autumn indicated a rate of 0.05 and 0.25 collisions for migrant and resident birds, respectively.

The bird survey conducted at the site indicates minimal spring migration movement, with only limited activity observed, suggesting that the collision risk for migrating birds is low for the study period in 2024. Low-moderate autumn migrant activity was recorded, which aligns with the understanding that autumn migratory movements are much more diffuse over the autumn season and spatially than spring movements, thereby activity can spread over a larger area near the major and minor routes, or even over much of Western Anatolia in general. A lot of the inner Aegean migrant movements are poorly understood due to both research and citizen science gaps, which is a key issue demonstrated well in Uygar WPP's unexpectedly high rates of migration, for example.

The risk assessment for resident birds indicates a low to medium level of risk, primarily affecting Short-toed Snake-Eagle (*Circaetus gallicus*) at a rate of 1 bird per 1-2 years and Eleonora's Falcon (*Falco eleonorae*) at a rate of 1 bird per 2 years. Both species are known to be common and widespread, but both are also known to show hovering/hanging flight and frequently forage near hilltops, which makes them more susceptible to collision. Additionally, due to the region's mild winters, which support wintering populations of the Common Buzzard (Buteo buteo), annual fatalities could increase.

The Eleonora's Falcon (*Falco eleonorae*) is a resident species in Türkiye but does not breed at the project site, instead exhibiting pre-breeding dispersal inland between April and July as part of its secondary summer distribution. No breeding colonies exist near the site. The nearest one is probably on Greek islets off Samos Island. In Turkey it is a highly rare, local and irregular breeding species. This is a peculiar species, that breed in autumn taking advantage of the abundant migrant passerines as prey, and spend the spring and summer (between April and July) wetlands, mountains and forests in parts of Turkey which is considered resident non-breeding.

The site offers suitable breeding and hunting habitats for some local raptor species. Common Buzzard (*Buteo buteo*) and Short-toed Snake Eagle (*Circaetus gallicus*) were recorded as code B4 holding territory. Both species are known to be common and widespread, but both are also known to show hovering flight and frequently forage near hilltops, which makes them more susceptible to collision.

No globally threatened soaring bird species were recorded during the surveys; only common species were observed.

During VP ETL surveys, all the observed species are classified as Least Concern (LC). Common Buzzard and White Storks were observed in relatively high numbers at risk height. 65% of the White Storks observed at risk height posing a collision risk. Bird observations along the energy transmission line indicate a relatively high frequency of bird passages at TL4. Additionally, ETL3 and ETL4 pose the highest risk for White Storks, though ETL3 was not highlighted since the overall risk was being considered. However White Stork is certainly more susceptible to ETL collision and electrocution therefore its activity is noteworthy. To mitigate these risks, priority measures could include the installation of additional bird diverters, rerouting the transmission line, or modifying its height.

During the breeding bird surveys, the majority of observed species are classified as Least Concern (LC) and are both common and widespread. The only globally threatened species recorded was the European Turtle Dove (*Streptopelia turtur*). Despite its status, this species is common and widespread in Türkiye and is known for its fast and low flight, which reduces its susceptibility to turbine collisions, as supported by carcass search data in Türkiye.

Additive Collision Risk Assessment (Project Galeforce)

Additive collision risk evaluation for Project Galeforce established from the 2024 baseline collection estimated the yearly total target species collision risk at 14 birds for the study period (spring, summer, autumn). The results indicate that about 11% of the collision risk was driven by migrant activity, while 80% of migrant collision risk was attributed to autumn period movement as opposed to spring migration. This finding is congruent with literature information regarding spring and autumn movement across Anatolia. Whereas spring movement occurs in a more concentrated manner spatially and temporally, autumn movement is usually more dispersed both over autumn period and geographically.

Interestingly, due to the correlation with autumn migrant activity, the project which accounted for the most estimated migrant risk was Uygar, followed by a three-way tie between Armutçuk, Ihlamur and Kestanederesi. Due to the massive area that over which Uygar spreads, its higher proportion in total migrant risk makes sense. Harmancık receiving little migratory activity and accounting for low risk this year was the least expected result, however Harmancık is indeed distinct in the sense that it is the only project where the percentage of migrant risk overall is approximately 50%, while others are lower, meaning risk at Harmancık is moreso driven by migrants than any other project. This is significant due to the year-on-year variations in migratory rates over minor routes, which are not as consistently active each year as the major routes are, however can exhibit bursts of activity over some years. This is one of the reasons long-term monitoring datasets are crucial.

For residents, approximately half of the collision risk is attributed to summer season while spring and autumn are more or less equivalent. In terms of species, Common Buzzard, Short-toed Snake Eagle and Eurasian Kestrel, which are common, abundant, breeding raptors, topped the collision risk estimations and accounted for approximately 65% of the estimated risk for residents. These species are expected to continue to be active post-construction due to the habituation effect, and many of the projects providing adequate habitat for feeding and opportunities for perching. Additionally, Eleanora's Falcon activity will continue to be associated with late-summer and autumn passerine migration movement, since their breeding activity is reliant on the food source represented by migrant passerines in autumn. The species is also an indirect indicator of passerine migration at each project and wherever they are active can be assumed to be significant fly-over and/or rest habitats for songbirds.

Two further considerations are pertinent for the additive collision risk evaluation. (1) Regarding substitution of data for Hacıhıdırlar, if summer and autumn are assumed homogenous with spring, the overall results are not altered much. However, if resident bird species are relatively more active over the summer, or if autumn migratory movement is similarly moderate like with some other projects, this has the potential to have a medium level of influence on the overall picture which is the more likely case. Operation phase monitoring and management may require a more pro-active approach due to baseline data gaps. Scheduling additional baseline collection study, while ensuring its smooth implementation ahead of construction is another option.

The second consideration is that (2) the baseline does not account for winter activity. As previously mentioned, target species activity in the WPP airspaces are generally expected to be diminished, though not non-existent. For some projects near important wetlands, such as Akköy and Ihlamur, wintering waterbird and wetland associating raptor activity might be a concern and these are discussed in respective final baseline reports. If winter activity is factored in as about the same as overall spring collision risk (which would indicate the maximum expected risk level), overall target species mortality for Project Galeforce would be contained within the range of 14-17 birds annually.

5.5 Bat

The methodology was applied effectively, and the results appear reliable. The survey confirmed that the equipment was deployed successfully, and recordings were completed across all seasons. The NatureScot methodology demonstrated that the 10-day monitoring period is effective. Drastic changes in bat call recordings across days highlighted significant fluctuations in bat activity.

Some technical issues were noted during specific surveys. During the analyses, it was observed that some detectors failed or stopped recording on certain nights. For instance, the detectors at SP3 and SP8 failed during the summer survey after the fifth day. Additionally, the SP8 detector failed again during the autumn survey. To address the issues related to the missing nights at certain Sampling Points, the average bat passes for each SP were calculated. Despite these issues, five full days of recordings from these detectors provided sufficient data for a meaningful analysis.

One challenge encountered during the project was accessibility. At the initial stages, the roads to SP9 were not accessible, and sampling could not be conducted at that location.

Access to turbine points is a major limitation of the study, and the results obtained from nearby areas can only serve as an indicator of the real activity at the turbine areas. The SPs are located (1) at lower elevations and (2) away from forest interiors, as the turbines are. Based on the construction schedule and the opening of site roads, the SPs will be relocated to the turbines they are representing. As such, SP6 was removed and SP09 and SP10 were added in autumn as roads became available for turbine zero location sampling.

The high activity areas were identified near SP4, SP5, SP6, and SP9. Seasonal trends in bat activity were observed: during spring, the highest activity was recorded near SP3 and SP5; in summer, activity concentrated near SP6 and SP8; and in autumn, the hotspots were SP5 and SP9. Transect surveys further confirmed that SP3 and SP9 consistently showed the highest bat activity levels.

In Turkey, assessing the risk level of a wind turbine is challenging due to the lack of comprehensive datasets and analytical ecological studies on bat population sizes. Based on ground static acoustic monitoring methodology, an indirect measure of activity levels is obtained in terms of recording numbers per unit time, which is not equivalent to number of individuals, yet is still a useful measure for gauging relative activity. The activity level, on average, is in the range of 50-100 recordings / night / turbine for the Project in the spring season, 150-250 recordings / night / turbine in summer, and 100-200 recordings / night / turbine in autumn. Noteworthy upticks in nightly recording counts were not identified.

Regarding species composition, the Common Pipistrelle (*Pipistrellus pipistrellus*) accounted for 60–80% of all recordings. This species is the most widespread and abundant bat in Europe and much of Türkiye. The second most recorded species was Kuhl's Pipistrelle (*Pipistrellus kuhli*) which is one of the most common species along the Mediterranean coastland.

In addition, a significant number of European Free-tailed Bats (*Tadarida teniotis*) were identified in spring, Serotine Bats (*Eptesicus serotinus*) in summer, and Long-eared Bats (*Plecotus* spp.) in autumn.

The species composition of the mobile recordings is very similar to that of the stationary detectors, confirming that the sampling at SPs accurately represents the bat composition across the entire project area.

Notably, the globally threatened Schreiber's Bent-winged Bat (*Miniopterus schreibersii*), classified as Vulnerable and requiring conservation attention, comprised approximately 6–18% of the recordings, representing a remarkably high proportion. The presence of *Miniopterus schreibersii* suggests the existence of caves in the area.

5.6 Monitoring and Mitigation Implications

The implications for additional project monitoring and mitigation measures based on final results are summarised below:

- Flora: The monitoring actions outlined in the BMP should be implemented, and the current status should be presented and evaluated in progress reports.
- Habitats: All natural habitats, including access roads and ETL areas should be monitored for disturbances, with BMP actions implemented and progress evaluated in reports.
- Bird species:
  - VP ETL4 segment, potentially along with VP ETL3 segment, should receive priority for ETL mitigation measures such as marking, rerouting or undergrounding. The BMPs prepared for the project offer more information on mitigation measures for ETL collision and electrocution.
- Bat species:
  - Future acoustic bat baseline and/or monitoring methodologies should focus on sampling turbine zero locations as they become accessible. Though some low elevation SPs have shown similar activity levels as the newly established (autumn) SPs in higher elevations, it is still a possibility that the lower activity levels identified at Dampınar is attributable to methodological limitations.
  - The population of the Schreiber's Bent-winged Bat (*Miniopterus schreibersii*), a globally threatened species, should be closely monitored to ensure its conservation.
- Terrestrial mammal: The monitoring actions outlined in the BMP should be implemented, with progress reports evaluating the status vulnerable mammal species and national importance.
- Herpetofauna: The monitoring actions outlined in the BMP should be implemented, with progress reports evaluating the status of *Testudo graeca*, a potentially present vulnerable reptile species.

6 Appendix

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6.6 Bird Survey Conditions

Spring

Date	Surveyor	VP	Cloud %	WindDir	WindSp (m/s)	Prec(mm)	Temp (°)	Vis (km)
17/04	BD	VP1	100	SE	13	0	26	10
17/04	CG	VP3	80	SW	6	0	26	10
17/04	MY	VP2	70	SE	6	0	26	10
18/04	BD	VP1	90	NW	12	0	23	10
18/04	MY	VP2	90	SW	6	0	25	10
18/04	CG	VP3	100	SW	6	5	23	10
14/05	CG	VP3	20	NW	7	0	24	10
14/05	MY	VP2	10	NW	6	0	24	10
14/05	BD	VP1	10	N	6	0	22	10
15/05	BD	VP1	10	NW	3	0	24	10
15/05	MY	VP2	0	NW	4	0	25	10
15/05	CG	VP3	0	NW	7	0	25	10
11/06	BD	VP1	0	SW	3	0	38	10
11/06	MY	VP2	0	SW	3	0	34	10
11/06	CG	VP3	0	W	4	0	37	10
12/06	BD	VP1	0	SW	5	0	39	10
12/06	MY	VP2	20	SW	3	0	41	10
12/06	CG	VP3	0	SW	6	0	41	10

Summer

Date	Surveyor	VP	Cloud %	WindDir	WindSp (m/s)	Prec(mm)	Temp (°)	Vis (km)
13/07	BD	VP1	0	NW	6	0	37	10
13/07	CG	VP3	0	N	8	0	36	10
13/07	MY	VP2	0	NW	4	0	37	10
14/07	CG	VP3	0	N	8	0	36	10
14/07	MY	VP2	0	N	5	0	37	10
14/07	BD	VP1	0	N	6	0	38	10
06/08	MY	VP2	0	NW	4	0	37	10
06/08	CG	VP3	0	NW	6	0	34	10
06/08	BD	VP1	0	NW	6	0	37	10
07/08	CG	VP3	0	N	8	0	35	10
07/08	MY	VP2	0	N	6	0	37	10
07/08	BD	VP1	0	N	6	0	37	10
10/08	CG	VP3	0	N	8	0	36	10
25/08	BD	VP1	0	NW	3	0	37	10
25/08	MY	VP2	0	NW	5	0	36	10
25/08	CG	VP3	0	NW	6	0	36	10

Autumn

Date	Surveyor	VP	Cloud %	WindDir	WindSp (m/s)	Prec(mm)	Temp (°)	Vis (km)
17/09	BD	VP1	10	W	3	0	29	10
17/09	MY	VP2	0	NW	4	0	21	10
17/09	CG	VP3	10	NW	5	0	29	10
18/09	BD	VP1	70	W	3	2	29	10
18/09	CG	VP3	60	W	5	0	29	10
18/09	MY	VP2	60	N	3	0	29	10
05/10	BD	VP1	0	W	4	0	30	10
05/10	MY	VP2	0	W	3	0	32	10
05/10	CG	VP3	0	W	4	0	32	10
07/10	CG	VP3	70	NW	7	0	27	10
07/10	BD	VP1	30	SW	2	0	29	10
07/10	MY	VP2	60	SW	3	0	27	10
29/10	BD	VP1	0	N	3	0	24	10
29/10	MY	VP2	0	N	4	0	26	10
29/10	CG	VP3	0	N	7	0	26	10
30/10	BD	VP1	30	N	4	0	23	10
30/10	MY	VP2	40	N	7	0	23	10
30/10	CG	VP3	60	N	8	0	23	10

6.7 Bird Observation Data

Sample rows from the Project bird data table is provided. Total duration of flight is noted as Dur. The height intervals are below the rotor height (a), at rotor height (b) and above the rotor height (c). Spec* abbreviations follow first three letters of genus name and first two letters of species name convention (for example, *Cirga denotes Circaetus gallicus*).

Spring

Date	VP	Time	Spec*	Number	Dur (sec)	Flight_Height	Behaviour	Status
17/04	VP1	12:46	Butbu	1	15	b-------------------	patrolling	Resident
17/04	VP1	13:51	Cirga	1	300	bbbbbcccbbbccccccccc	hunting/foraging	Resident
17/04	VP1	15:25	Cirga	1	120	bbbbaaaa------------	hunting/foraging	Resident
17/04	VP1	15:57	Cirga	1	180	bbbbbcccccc---------	patrolling	Resident
17/04	VP1	16:29	Cirga	1	180	cccbbbbaaabb--------	patrolling	Resident
17/04	VP1	16:46	Cirga	1	60	bbaa----------------	hunting/foraging	Resident
17/04	VP1	16:48	Cirga	1	15	b-------------------	patrolling	Resident
17/04	VP1	17:20	Butbu	2	120	aaabbbbb------------	patrolling	Resident
17/04	VP3	14:16	Butbu	1	60	babb----------------	patrolling	Resident
17/04	VP3	14:28	Cirga	1	240	ccccccccbbbccccc----	patrolling	Resident
17/04	VP3	14:32	Butbu	1	75	babbb---------------	patrolling	Resident
17/04	VP3	14:47	Cirga	2	180	cccbbccccccc--------	patrolling	Resident
17/04	VP3	15:33	Cirga	1	150	ccccbbcccc----------	patrolling	Resident
17/04	VP3	16:31	Accni	1	30	bc------------------	patrolling	Resident
17/04	VP3	16:34	Cirga	3	90	bbbccc--------------	patrolling	Resident
17/04	VP3	17:08	Cirga	1	300	ccccccccbbbccccbbccc	patrolling	Resident
17/04	VP2	11:54	Cirga	1	210	bbbbbbbbbbbbbb------	hunting/foraging	Resident
17/04	VP2	12:17	Cirga	1	60	bbbb----------------	hunting/foraging	Resident
17/04	VP2	12:50	Butbu	1	30	bb------------------	patrolling	Resident
17/04	VP2	13:52	Cirga	1	90	bbbccc--------------	hunting/foraging	Resident
17/04	VP2	14:25	Cirga	1	120	bbbbbbaa------------	hunting/foraging	Resident
…								

Summer

Date	VP	Time	Spec*	Number	Dur (sec)	Flight_Height	Behaviour	Status
13/07	VP1	14:14	Falel	1	45	bbb-----------------	patrolling	Resident
13/07	VP1	15:21	Butbu	1	60	bbbb----------------	patrolling	Resident
13/07	VP1	16:37	Cirga	1	90	bbcccb--------------	patrolling	Resident
13/07	VP3	10:46	Cicni	1	75	bbbbc---------------	patrolling	Resident
13/07	VP3	10:46	Butbu	1	45	bbb-----------------	patrolling	Resident
13/07	VP3	10:57	Falel	4	60	bbbc----------------	patrolling	Resident
13/07	VP3	11:00	Butbu	1	60	bbbc----------------	patrolling	Resident
13/07	VP3	11:12	Perap	1	45	bcc-----------------	patrolling	Resident
13/07	VP3	12:38	Falel	1	30	bc------------------	patrolling	Resident
13/07	VP3	13:10	Perap	1	120	bbccccc-------------	patrolling	Resident
13/07	VP3	13:12	Falel	2	45	bbb-----------------	patrolling	Resident
13/07	VP3	13:44	Falel	1	60	ccbb----------------	patrolling	Resident
13/07	VP3	14:01	Falel	1	45	bab-----------------	patrolling	Resident

13/07	VP3	14:20	Butbu	1	75	bbccc---------------	patrolling	Resident
13/07	VP3	14:20	Falel	4	60	bbbc----------------	patrolling	Resident
13/07	VP3	15:53	Cirga	2	75	cbbbc---------------	patrolling	Resident
13/07	VP3	15:54	Falel	1	60	bbcb----------------	patrolling	Resident
13/07	VP3	16:02	Falel	4	300	bbbbccbbbbccbbbbaabb	patrolling	Resident
13/07	VP3	16:17	Cirga	1	45	bbc-----------------	hunting/foraging	Resident
13/07	VP3	16:19	Falel	2	240	bbbbaabbbbaabbcc----	patrolling	Resident
13/07	VP3	16:31	Falel	5	300	ccbbbbaabbbbccbbbbaa	patrolling	Resident
…								

Autumn

Date	VP	Time	Spec*	Number	Dur (sec)	Flight_Height	Behaviour	Status
17/09	VP1	13:35	Cirga	2	240	aaabbbaaabbbaaaa----	hunting/foraging	Resident
17/09	VP1	13:40	Cirga	1	15	a-------------------	patrolling	Resident
17/09	VP1	16:16	Butbu	1	45	bba-----------------	patrolling	Resident
17/09	VP1	16:16	Cirga	2	240	bbbbaabbbbaabbbb----	hunting/foraging	Resident
17/09	VP2	12:05	Cirae	1	180	cccccccccccc--------	migrating	Migrant
17/09	VP2	12:19	Butbu	1	45	baa-----------------	patrolling	Resident
17/09	VP2	14:43	Cirga	1	780	cccccccccccccccccccc	hunting/foraging	Resident
17/09	VP2	06:18	Accni	1	60	cccc----------------	straight flight	Resident
17/09	VP3	09:58	Cirga	1	60	bbbb----------------	patrolling	Resident
17/09	VP3	10:20	Accni	1	45	ccc-----------------	patrolling	Resident
17/09	VP3	10:22	Cirga	1	90	bbbbbb--------------	patrolling	Resident
17/09	VP3	10:29	Accni	2	45	bba-----------------	patrolling	Resident
17/09	VP3	10:47	Butbu	1	75	bbabb---------------	patrolling	Resident
17/09	VP3	11:59	Perap	2	90	cccccb--------------	migrating	Migrant
17/09	VP3	12:55	Cirga	1	45	bab-----------------	patrolling	Resident
17/09	VP3	12:55	Accni	1	45	bba-----------------	patrolling	Resident
17/09	VP3	14:24	Cirga	2	30	ba------------------	patrolling	Resident
17/09	VP3	14:57	Cirga	2	300	bbabbabbabbabbabbabb	patrolling	Resident
17/09	VP3	16:08	Cirga	2	195	ccccccccccccc-------	patrolling	Resident
18/09	VP1	09:38	Butbu	2	60	bbcc----------------	patrolling	Resident
18/09	VP1	14:44	Butbu	1	60	bbaa----------------	patrolling	Resident
…								

6.8 Collision Probability Calculation

Calculation of collision risk for bird passing through rotor area as in NatureScot (2010),

Only enter input parameters in blue

Parameters	Value	Unit
K: [1D or [3D] (0 or 1)	1	
NoBlades	3	
MaxChord	4,2	m
Pitch (degrees)	30	
Species	Common Buzzard	
BirdLength	0,58	m
Wingspan	1,37	m
F: Flapping (0) or gliding (+1)	1	
Bird speed	11,6	m/sec
RotorDiam	138	m
RotationPeriod	5,00	sec

Calculation of alpha and p(collision) as a function of radius

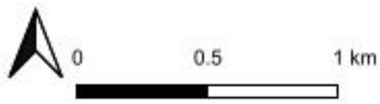
			Upwind:			Downwind:		
r/R	c/C	a	collide		contribution	collide		contribution
radius	chord	alpha	length	p(collision)	from radius r	length	p(collision)	from radius r
0,025	0,575	5,35	17,07	0,88	0,00110	14,65	0,76	0,00095
0,075	0,575	1,78	6,49	0,34	0,00252	4,08	0,21	0,00158
0,125	0,702	1,07	5,14	0,27	0,00332	2,19	0,11	0,00142
0,175	0,860	0,76	4,86	0,25	0,00440	1,25	0,06	0,00113
0,225	0,994	0,59	4,76	0,25	0,00554	0,58	0,03	0,00068
0,275	0,947	0,49	4,09	0,21	0,00581	0,74	0,04	0,00105
0,325	0,899	0,41	3,81	0,20	0,00640	1,12	0,06	0,00188
0,375	0,851	0,36	3,47	0,18	0,00673	1,26	0,07	0,00244
0,425	0,804	0,31	3,18	0,16	0,00700	1,34	0,07	0,00295
0,475	0,756	0,28	2,94	0,15	0,00721	1,39	0,07	0,00341
0,525	0,708	0,25	2,72	0,14	0,00738	1,41	0,07	0,00382
0,575	0,660	0,23	2,52	0,13	0,00750	1,40	0,07	0,00417
0,625	0,613	0,21	2,34	0,12	0,00756	1,38	0,07	0,00448
0,675	0,565	0,20	2,17	0,11	0,00757	1,35	0,07	0,00473
0,725	0,517	0,18	2,01	0,10	0,00753	1,31	0,07	0,00493
0,775	0,470	0,17	1,86	0,10	0,00744	1,27	0,07	0,00508
0,825	0,422	0,16	1,71	0,09	0,00730	1,21	0,06	0,00517
0,875	0,374	0,15	1,57	0,08	0,00710	1,15	0,06	0,00522
0,925	0,327	0,14	1,43	0,07	0,00685	1,09	0,06	0,00521
0,975	0,279	0,14	1,30	0,07	0,00655	1,02	0,05	0,00515
Overall p(collision) =				Up-wind	12,3%		Downwind	6,5%
				Average	9,4%			

6.9 Sample Field Recording Sheets

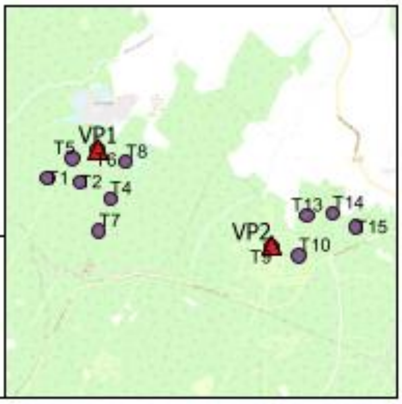
6.9.1 VP Map and Sheet

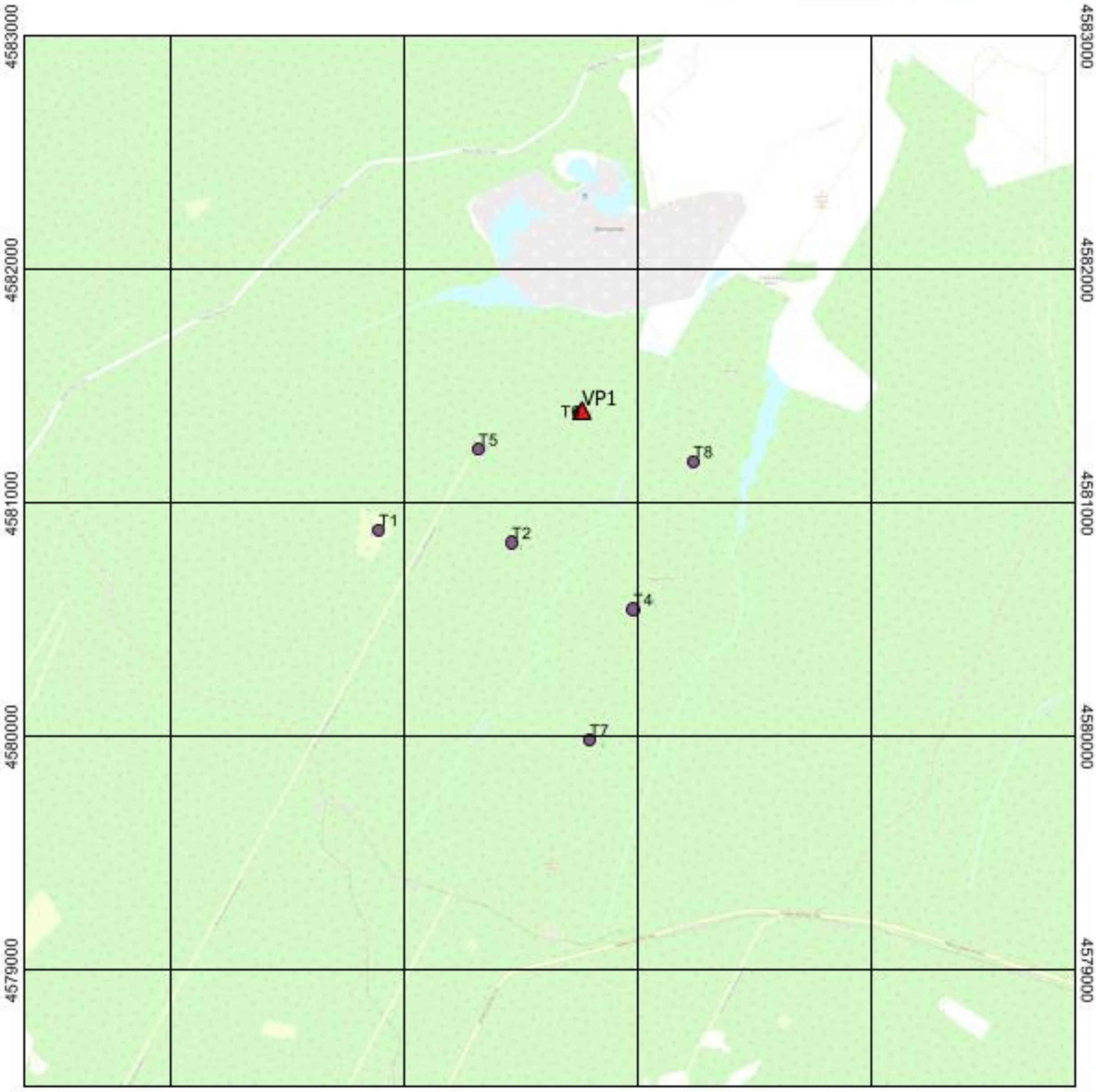
VP Number	
Surveyor	
Project	

Date	
Start Time	
End Time	



1:25.000
WGS 84 UTM 35N





Project		VP			Cloud cover	%	Precipitation	mm
Date		Start1-Finish1-			Wind Direction		Temp. (max)	ºC
Surveyor		Start2-Finish2			Wind Speed	m/s	Visibility	km
Comments								

Height: A (below rotor height), B (at rotor height), C (above rotor height)

	Time	Species	Count	Behaviour	Resident/Migrant/Unclear	Duration (sec)	Height	60	120	180	240	300
1							C					
							B					
							A					
2							C					
							B					
							A					
3							C					
							B					
							A					
4							C					
							B					
							A					
5							C					
							B					
							A					
6							C					
							B					
							A					
7							C					
							B					
							A					
8							C					
							B					
							A					
9							C					
							B					
							A					

6.9.2 Breeding Bird

Project		Point		Start time		Temperature (Celsius)	
Date		North (UTM)		Finish time		Wind direction	
Surveyor		East (UTM)		Duration (min)		Wind speed (m/s)	
Notes						Precipitation (mm)	
						Visibility (km)	

Species	Min. count	Max. count	Breeding code	Species	Min. count	Max. count	Breeding code

6.9.3 Acoustic Bat

Project		Coordinates (Utm-Wgs84)	
Surveyor		Folder Name	
Location		4 Directional Photo	☐
Detector Serial#		Notes	

Start	Control	Finish	Date	Hour	# Recording	Temp (C°)	Cloud (%)	Wind (M/S)	Precipitation?	Fog?	Notes
☐	☐	☐	___/___/___	___:___					☐	☐	
☐	☐	☐	___/___/___	___:___					☐	☐	
☐	☐	☐	___/___/___	___:___					☐	☐	
☐	☐	☐	___/___/___	___:___					☐	☐	
☐	☐	☐	___/___/___	___:___					☐	☐	

6.10 Flight Line Maps

[Maps were provided in a separate document.]