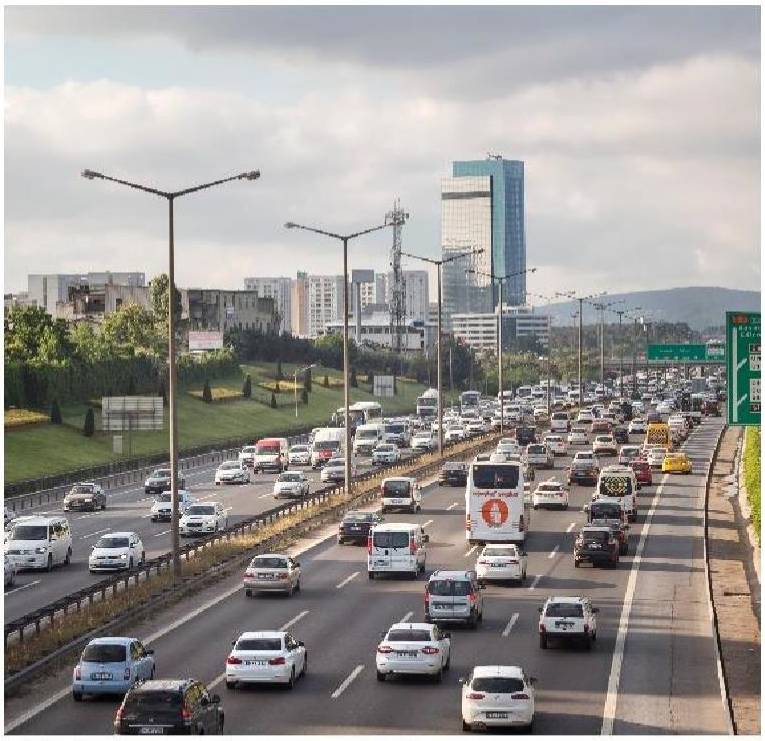








Biodiversity Action Plan

Nakkas Basaksehir Highway, Türkiye

12 December 2025

Project No.: 0580559

Nakkaş Otoyol Yatırım ve İşletme A.Ş

The business of sustainability

The business of sustainability

Document details	
Document title	Biodiversity Action Plan
Document subtitle	Nakkas Basaksehir Highway, Turkey
Project No.	0580559
Date	12 December 2025
Version	Draft
Author	Javier Odriozola, Giulio Marin, Jorge Sánchez, Maria del Carmen Peña, Adam Teixeira- Leite, Sarah Ben Hamadou, Nehir Yıldız
Client Name	Rönesans Holding

Document details

Version	Revision	Author	Reviewed by	ERM approval to issue		Comments
				Name	Date	
Draft	0.1	ERM	Serkan Kirdogan	Raimund Vogelsberger	30.06.2022	Draft for client review
Draft	0.2	ERM	Serkan Kirdogan	Raimund Vogelsberger	26.08.2022	Draft for client review
Draft	0.3	ERM	Serkan Kirdogan	Raimund Vogelsberger	22.09.2022	Draft for client review
Draft	0.4	ERM	Serkan Kirdogan	Raimund Vogelsberger	29.09.2022	Final Draft
Draft	0.5	ERM	Adam Teixeira-Leite	Serkan Kirdogan	24.02.2025	Draft for client review
Draft	0.6	ERM	Adam Teixeira-Leite	Serkan Kirdogan	18.03.2025	Draft for client review
Draft	0.7	ERM	Adam Teixeira-Leite	Serkan Kirdogan	26.03.2025	Final Draft
Draft	0.8	ERM	Adam Teixeira-Leite	Serkan Kirdogan	02.06.2025	Draft for client review
Draft	0.9	ERM	Caner Şahin	Serkan Kirdogan	12.12.2025	Draft for client review

Signature Page

12 December 2025

Biodiversity Action Plan

Nakkas Basaksehir Highway, Turkey

Name Job title	Name Job title

ERM GmbH
Brüsseler Str. 1-3 60327
Frankfurt am Main Germany

© Copyright 2023 by ERM Worldwide Group Ltd and / or its affiliates ("ERM").
All rights reserved. No part of this work may be reproduced or transmitted in any form,
or by any means, without the prior written permission of ERM

CONTENTS

1. INTRODUCTION 1
1.1 Purpose of this BAP 1
1.2 Scope of this BAP 2
1.3 Contents of this BAP 3

2. PROJECT DESCRIPTION 4

3. RELEVANT STANDARDS AND GUIDELINES 6
3.1 Turkish Environmental Law (No: 2872) 6

3.2 EBRD PR6 6
3.2.1 No Net Loss/ Net Gain 6
3.2.2 Mitigation Hierarchy 6
3.3 IFC Performance Standards 6
3.3.1 Performance Standard 1 (Assessment and Management of Environmental and Social Risk and Impacts) 6
3.3.2 Performance Standard 6 (Biodiversity Conservation and Sustainable Management of Living Natural Resources) 6
3.3.2.1 No Net Loss/ Net Gain Assessment 7
3.3.2.2 Mitigation Hierarchy 7
3.4 Other Applicable Standards, International Conventions and Treaties Relevant for Biodiversity Conservation 8
3.4.1 Convention on Biological Diversity 8

4. MAIN FINDINGS OF BIODIVERSITY BASELINE; IMPACT ASSESSMENT AND CRITICAL HABITAT ASSESSMENT 9
4.1 Key Biodiversity Areas 9
4.2 Species of Conservation Interest 11
4.2.1 Flora 11
4.2.2 Birds 13
4.2.3 Mammals 13
4.2.4 Reptiles and Amphibians 14
4.2.5 Fish 14
4.3 Natural/ Modified Habitat 15
4.4 Priority Biodiversity and Critical Habitat features 17
4.5 Impact Assessment 18

5. BAP RESULTS – ENVIRONMENTAL LIABILITIES 25
5.1 Habitat Types within the Project Area 25
5.1.1 Updated Habitat Mapping 25
5.1.2 Habitat types 25
5.2 Natural/ modified habitat 29
5.3 Critical Habitat and Priority Biodiversity Features 29
5.3.1 Loss of ecological function of Küçükçekmece Basin IBA and KBA 29
5.3.2 Loss of ecological function of West Istanbul Grasslands IPA 31
5.3.5 Calculation of Habitat Liability 34

6. BAP IMPLEMENTATION 36
6.1 Roles and Responsibilities 36
6.2 BAP Review 36
6.3 Biodiversity Implementation Strategy 37

7. BIODIVERSITY MONITORING AND EVALUATION (BMEP) 44
7.1 In-situ monitoring 44
7.1.1 Biodiversity Evaluation Requirements 44

8. NEXT STEPS AND UPDATES 45

APPENDIX A HABITAT LIABILITY APPROACH 50

APPENDIX B UPDATED HABITAT MAPPING 53

List of Tables

Table 1 Key components description of the Projects 4
Table 2 Key Biodiversity Areas associated to the Project area 9
Table 3 Species of conservation interest in the Project area 14
Table 4 Critical Habitat Assessment result 17
Table 5 Impact Assessment results of Critical Habitat (CH) and Priority Biodiversity Features (PBF) 19
Table 6 Habitat types associated to the Project area (*PBF habitats in Bold text).....25
Table 7 Area acquired for the Project's development.....29
Table 8 Habitat Hectares/Offset Area Required 32
Table 9 Overview of Biodiversity Implementation Options.....36
Table 10Interim Monitoring and Evaluation 38
Table 11 Next Steps and Progress for the Implementation of the BAP.....40

List of Figures

Figure 1 Project location..... 5
Figure 2 Mitigation Hierarchy..... ..7
Figure 3 Sensitive Areas overlapping with the project area 10
Figure 4. *Cirsium polycephalum* locations around the Highway route including those identified in the ESIA (current locations) and those from recent pre-construction surveys ('new locations').....12
Figure 5. *Galanthus x valentinei* locations around the Highway route ('new location').....12
Figure 6 Natural and Modified Habitat Areas within the Project Area ..... .16
Figure 7 Habitat distribution along the Study Area..... ….28
Figure 8 Organizational Chart of Construction Phase.....34

Acronyms and Abbreviations

Name	Description
ACA	Additional Conservation Actions
BAP	Biodiversity Action Plan
BMEP	Biodiversity Monitoring and Evaluation Plan
BMP	Biodiversity Management Plan
CESMP	Construction Environmental and Social Management Plan
CH	Critical Habitat
CHA	Critical Habitat Assessment
CR	Critically Endangered
EAAA	Ecologically Appropriate Area of Assessment
EBRD	European Bank for Reconstruction and Development
EN	Endangered
ERM	Environmental Resources Management Ltd.
ESIA	Environmental and Social Impact Assessment
ESMS	Environmental Social Management System
EUNIS	European Nature Information System
GN	Guidance Note
IBA	Important Bird and Biodiversity Area
IFC	International Finance Corporation
IPA	Important Plant Area
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
LC	Least Concern
NA	Not Assessed
NE	Not Evaluated
NG	Net Gain
NL	Not Listed
NNL	No Net Loss
NT	Near Threatened
PBF	Priority Biodiversity Feature
PR	Performance Requirements
PS	Performance Standard
RoW	Right of Way
UNEP	United Nations Environment Programme
VU	Vulnerable

Definitions

Critical habitat:

Areas identified as critical habitat hold the highest tier of irreplaceable (existing in few places) and vulnerable (at high risk of being lost) biodiversity features (EBRD PR6, 2019). Critical habitats are areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered and/or Endangered species; (ii) habitat of significant importance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species and/or congregator species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes (IFC, 2012). The criteria used by the EBRD's PR6 to define critical habitat build on and are closely aligned with those used in IFC PS6.

No Net Loss (of biodiversity):

An approach and goal for a development project, policy, plan or activity in which the impacts on biodiversity it causes are balanced by measures taken to avoid and minimize the impacts, to restore affected areas and finally to offset the residual impacts, so that no loss remains. No net loss (NNL) is defined by EBRD as "The point at which project-related impacts on priority biodiversity features are reduced by avoidance, minimisation and/or reinstatement measures, and offsetting compensates fully for all significant residual impacts – that is to say, no significant net impacts on biodiversity remain" (EBRD PR6, 2019).

Net Gain (of biodiversity):

An approach and goal for a development project, policy, plan or activity in which the impacts on biodiversity it causes are outweighed by measures taken to avoid and minimize the impacts, to restore affected areas and finally to offset the residual impacts, so that natural environment is left in a measurably better state than it was beforehand. Net Gain (NG) is defined by EBRD as "Going beyond "no net loss", through achievement of additional conservation outcomes for the biodiversity features for which critical habitat was designated. Net gains will usually be achieved through the development of a biodiversity offset" (EBRD PR6, 2019).

(Biodiversity) Offset:

According to EBRD PR6 (2019), a biodiversity offset refers to "Measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts" and "The goal of biodiversity offsets is to achieve "no net loss" and preferably a net gain of biodiversity on the ground". Biodiversity offsets should also be considered a last resort in any mitigation package and should only be attempted with input from credible external experts with relevant experience in their design and implementation.

Mitigation hierarchy:

A tool commonly applied in Environmental Impact Assessments (EIAs) which helps to manage biodiversity risk. The hierarchy of controls that begins with avoidance, then considers minimization or reduction of impacts, followed by restoration actions and finally compensation for biodiversity loss (e.g. through offsetting) as a last resort measure only once all other options have been considered/exhausted.

Priority biodiversity features:

This concept replaces the previous definition of natural habitat used previously by EBRD and adopts a criterion-based approach already used for definition of critical habitat. Priority in all EBRD definitions combines consideration of irreplaceability and vulnerability. Priority biodiversity features (PBF) have a high, but not the highest, degree of irreplaceability and/or vulnerability. Although a level below critical habitat in sensitivity, they still require careful consideration during project assessment and impact mitigation (EBRD PR6, 2019).

Rehabilitation:

A management action that aims to restore a certain level of ecosystem functioning in degraded sites, to reverse negative impacts by repairing and replacing the essential or primary ecosystem structures and functions which have been altered or eliminated by disturbance.

Restoration:

The process of reclaiming habitat and ecosystem functions by restoring the lands and waters on which plants and animals depend. This differs from rehabilitation, in that the goal is to restore the ecosystem or habitat to its former state or better.

1. INTRODUCTION

This Biodiversity Action Plan (BAP) has been prepared to assist Nakkas-Basaksehir Highway Project (hereinafter as "the Project"), which is located in western part of Istanbul passing through five districts: Başakşehir, Arnavutköy, Avcılar Çatalca and Büyükçekmece, to comply with the requirements of the European Bank of Reconstruction and Development (EBRD) Performance Requirement (PR) 6 - Biodiversity Conservation and Sustainable Management of Living Natural Resources. ERM Germany was commissioned by Nakkaş Otoyol Yatırım ve İşletme A.Ş. (hereinafter as "Client") to undertake this BAP.

1.1 Purpose of this BAP

The BAP is the result of the outcomes analysis of the Project's Critical Habitat Assessment (CHA) and ESIA (Authored by ERM and undergoing lender review) and consolidates the biodiversity and ecosystem service mitigation actions on specific biodiversity features as outlined in Critical Habitat Assessment (CHA) for the Project (ERM, 2022). The CHA, originally prepared in 2022, has been updated in February 2025 by ERM to incorporate findings from recent additional flora and fauna surveys, specifically the "Before Construction Biodiversity Baseline Report, (2023)" and the "Additional Bat Survey Study Report, (2024)", and to account for any changes to IUCN global species threat status. The additional surveys were commissioned and conducted by the client in accordance with Environmental and Social Action Plan (ESAP) requirements, ensuring compliance with lender standards. Overall, only minor updates were made to the CHA report which do not change the main findings, outcomes and implications for the Project and the BAP. Based on the results of the ESIA/ CHA, Critical Habitat (CH) and Priority Biodiversity Features (PBF) have been identified, with construction phase residual impacts not considered to be of significance once the mitigation hierarchy is fully applied (i.e. impacts assessed as of negligible/minor significance); whereas operational phase significant residual impacts remain under a precautionary approach for aspects related to air pollution on habitats/flora.

The purpose of this BAP is basically to detail the justification of the on-site restoration activities (considered within the mitigation hierarchy) to obtain non- significant residual impacts on CH and to propose additional/complementary actions to aim towards reaching a net gain on some of those CH features.

The BAP presents the following:

- Definition of biodiversity policies and obligations;
- Impact net loss accounting:
- Identification of Biodiversity Complementary Actions.

Limitations

- Note that the BAP should be interlinked to the Project's Construction Environmental and Social Management Plan – CESMP[1] part of the ESIA, the latter address all minimization, mitigation and restoration measures, including re-location, re-planting etc., to be undertaken within the Project footprint, expropriation corridor, or sometimes also ex-situ, to obtain non-significant residual impact during the construction phase.
- During discussions with client, the scope of the Critical Habitat Assessment underwent some changes that affected the initial scope of the present BAP, notably the exclusion of quarry sites from the ESIA/CHA analysis, whom where noted for harbouring flora species that were identified as triggers for critical habitat (i.e. *Centaurea hermannii* (IUCN CR)).
- Throughout lender review of the CHA/ESIA and the present BAP; further changes have been made in the BAP in regard to the findings of these former documents on CH/PBF triggers,

[1] [1] Project's CESMP contains relevant biodiversity mitigations and complementary plans that would fall within a Biodiversity Management Plan (BMP).

and additional mitigation requirements described.

- Field studies related to the updated CHA and subsequent BAP revisions (e.g. the "Before Construction Biodiversity Baseline Report" and the "Additional Bat Surveys Study Report") were conducted by client as part of their ESAP commitments. ERM did not undertake any direct fieldwork for these additional surveys but relied on client- provided data for analysis and integration into the CHA and BAP updates.
- This BAP is based on a precautionary approach and current project design. Any further changes to project design, construction methods, or operational plans may require additional updates to ensure alignment with CHA and BAP objectives.

EBRD PR6

According to EBRD Guidance Note (GN) 6 Biodiversity Conservation and Sustainable Management of Living Natural Resources, a BAP is required for projects located in critical habitat and is recommended for high-risk projects in natural habitats[2]. The BAP should describe:

(i) The composite of actions and a rationale for how the project's mitigation strategy will achieve net gain (or no net loss);

(ii) The approach for how the mitigation hierarchy will be followed; and

(iii) The roles and responsibilities for internal staff and external partners.

BAPs are living documents that should include agreed-on timelines for regular review and updates as new information arises, project implementation progresses, and conservation context changes over time. Where project mitigation measures are included in the project Environmental Social Management System (ESMS)/Biodiversity Management Plan (BMP), this should be referenced in the BAP. A BAP differs from a BMP in that the latter is an operational document developed largely for site managers and contractors; whereas the BAP will almost always include actions for off-site areas (for example, offsets and additional actions) and involve external partners (for example, implementing partners, reviewers, or advisors). The BAP may also be accompanied by documents that would be developed at a later timeframe, such as an Offset Management Plan or a Biodiversity Monitoring and Evaluation Plan (BMEP). In these cases, the BAP would be updated to reference these accompanying documents when they are developed. Depending on the nature and scale of the project, an initial BAP may describe a strategy and timeline for identifying actions to deliver a net gain "NG" (or no net loss – "NNL")).

1.2 Scope of this BAP

The BAP is intended to identify no net loss or net gain opportunities through these key work streams:

- Confirmation of no significance of residual impacts on PBF/CH features: based on updated CHA/ESIA report outcomes which now include findings from the "Before Construction Biodiversity Baseline Report" and the "Additional Bat Surveys Study Report", avoidance, minimization, mitigation and restoration practices have been identified to address these features to obtain non-significant residual impacts. To the update CHA has refined the understanding of Critical Habitat (CH) and Priority Biodiversity Features (PBF) based on the additional data provided by the client as part of their ESAP commitments. To facilitate the understanding and details of the mitigation hierarchy in terms of on-site re-planting of vegetation CH species to obtain no net loss, a habitat mapping was conducted. The map has been prepared based on use of satellite/aerial imagery to identify the habitats distributed within the expropriation corridor.

  The outcomes of the calculations are to estimate the amount (i.e. area) of habitats that should be restored.

- Identification of Biodiversity Compensation/Offsets: Proposed compensation/offsets are to cover:

  i) Restoration/recovery offsets outside the Project`s expropriation corridor (not relevant

in this case as all restoration practices can occur within it)

ii) Offset through habitat restoration/recreation within the road RoW as compensation for permanent habitat losses towards meeting NNL (for PBFs) and NG objectives (for CH); and

iii) Identification of Complementary Measures: Also called Additional Conservation Actions (ACA), which are not specifically aimed primarily at meeting NNL or NG objectives but may contribute to NG (although these are inherently difficult to quantify or measure in practice).

1.3 Contents of this BAP

Following this Introduction, the BAP is structured as follows:

- Section 2 – a summary of the Project description
- Section 3 – relevant standards and guidelines
- Section 4 – a summary of the biodiversity baseline and impact assessment, and its connection to the CHA, where PBF and CH was identified.
- Section 5 – methodological approach for the BAP and key results
- Section 6 –BAP implementation roles and strategy.
- Section 7 – BAP monitoring.
- Section 8 – Next steps suggested towards BAP implementation.

2. PROJECT DESCRIPTION

The Project is located in western part of Istanbul passing through five districts: Başakşehir, Arnavutköy, Avcılar, Çatalca and Büyükçekmece (Figure 1), with a combined population of around 1.5 million[2].

The Project will be a new 4-lane dual Motorway, 2x2 lane connecting roads and Cable Stayed Bridge which is intended to be used solely by motor vehicles such as automobiles, buses, small and large trucks/lorries, and motorcycles. Special vehicles (such as over-sized transporters), or lorries carrying certain hazardous cargoes will be subject to approval by KGM in accordance with the Turkish highway regulations applicable for all such motorways. Pedestrians, bicycles, grazing animals, slow-moving farm vehicles and other vehicles that are inappropriate for such a motorway will be prohibited. As a limited access roadway, there will be no traffic-light intersections; entry or exit will be via right-side ramps at newly built interchanges.

The length of the main road is 24 km plus 5 km of connecting roads, for a total of 29 km. The construction of Nakkaş - Başaksehir Motorway has started in August 2021 and is planned to be completed by the first quarter of 2027.

The key components of the Projects are presented in Table 1.

Table 1 Key components description of the Projects

Component	Details
Length of main road	24 km
Length of connecting roads	5 km
Cross Sections	2x4 lanes for main Motorway and 2x3 for connecting road
Interchanges	10
Cable Stayed Bridge	1,619 m (Length) x 46 m (Width) and Tower Height of 196 m
Overpasses	18
Underpasses	18
Viaducts	5
Culverts	55
Toll Booth	The number of toll booths has not been specified at the current stage. Free flow systems and tollgate toll collection systems will be incorporated in the Project, similar to the other segments of the NMM.
Lighting	Will be provided at cable stayed bridge, intersections and toll booths.
Service Stations/Rest Areas	There are no service stations/rest areas are envisaged.
O&M Facilities	There are two O&M facilities planned at KM 36+300 and at 49+200 specific for Sazlıdere Cable Stayed Bridge. These O&M facilities will also serve as Disaster Recovery centres.

Source: ESIA Report, 2023

[2] TUIK Address Based Population Registration System (ADNKS) results, 2020

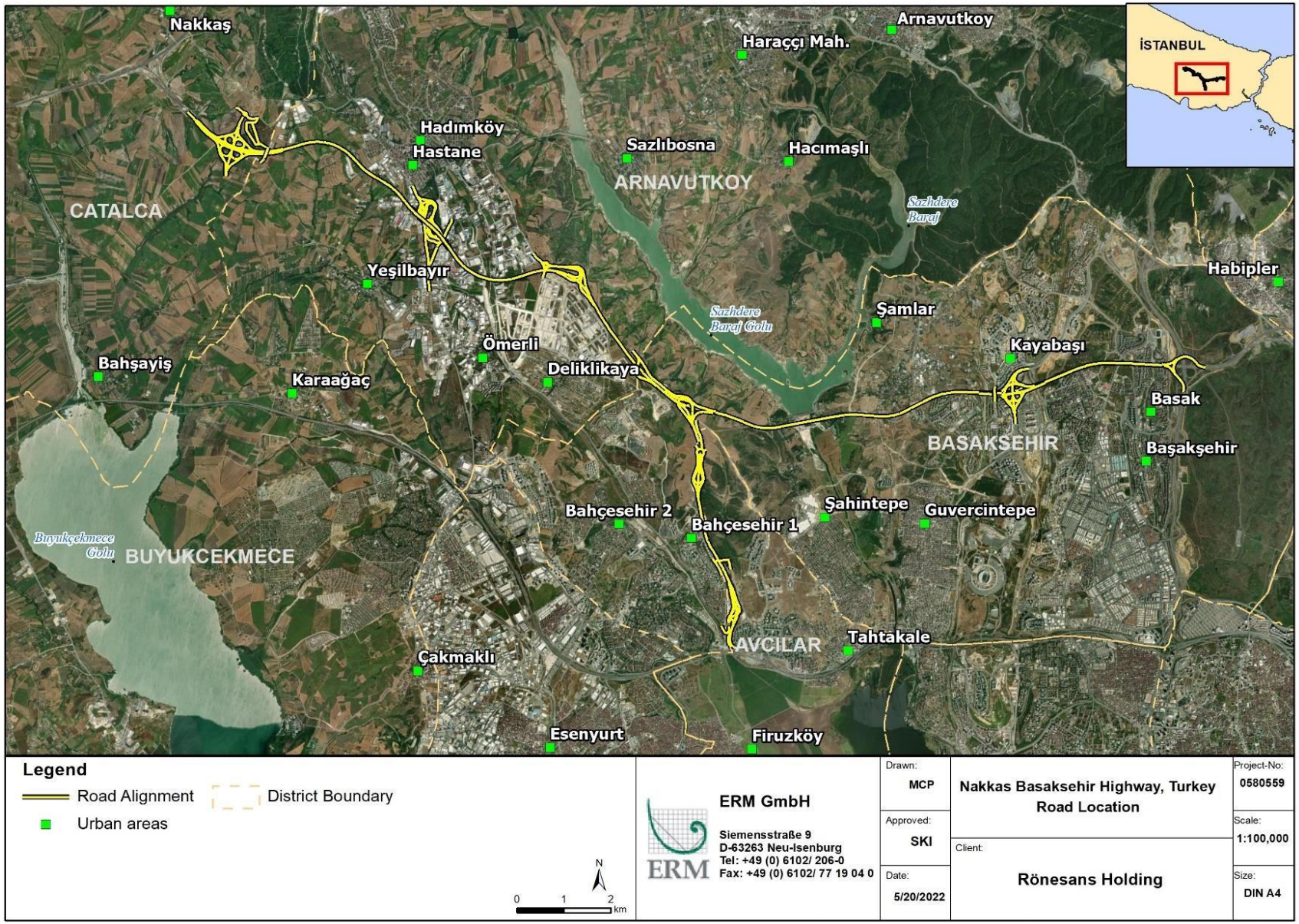


Figure 1 Project location

3. RELEVANT STANDARDS AND GUIDELINES

The BAP is produced in accordance with: EBRD PS 6 and IFC PS6 as described in Section 3.2; Turkish law as described in the following Section.

3.1 Turkish Environmental Law (No: 2872)

This law, that came into force in 1983, is Turkey's primary framework for environmental legislation and is supported by a series of regulations that have been developed in line with national and international initiative and standards, and some of them have been revised recently to be harmonized with the European Union (EU) Directives in the scope of pre-accession efforts of Turkey.

3.2 EBRD PR6

3.2.1 No Net Loss/ Net Gain

EBRD PR6 defines no net loss (NNL) as the point at which Project-related impacts on priority biodiversity features are reduced by avoidance, minimisation and/or reinstatement measures, and offsetting compensates fully for all significant residual impacts – that is to say, no significant net impacts on biodiversity remain

Net gain is going beyond "no net loss", through achievement of additional conservation outcomes for the biodiversity features for which critical habitat was designated. Net gains will usually be achieved through the development of a biodiversity offset.

3.2.2 Mitigation Hierarchy

Mitigation efforts are expected to follow a mitigation hierarchy, starting with avoidance, minimisation, restoration and, finally, offsetting. Mitigation should be designed to achieve no net loss, and preferably a net gain, of priority biodiversity features over the long term, whilst for critical habitat impacted by the project, mitigation should be designed to achieve net gain.

3.3 IFC Performance Standards

3.3.1 Performance Standard 1 (Assessment and Management of Environmental and Social Risk and Impacts)

IFC Performance Standard (PS) 1 aims to identify and assess environmental (including biodiversity) and social risks and impacts of any given project. The project must adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimise, and where residual impacts remain, compensate/offset for risks and impacts to workers, affected communities and the environment. PS1 promotes improved environmental and social performance of clients through the effective use of management systems. Furthermore, the standard promotes and provides a means for adequate engagement with Affected Communities throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated.

3.3.2 Performance Standard 6 (Biodiversity Conservation and Sustainable Management of Living Natural Resources)

PS 6 recognises that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living and natural resources are fundamental to sustainable development. A Biodiversity Action Plan (BAP) is required for projects located in critical habitat and it is recommended for high-risk projects in natural habitats.

3.3.2.1 No Net Loss/ Net Gain Assessment

The application of the mitigation hierarchy is required in order to demonstrate whether no net loss or net gain has been achieved by the project. Residual impacts to natural habitats are required to achieve a no net loss of biodiversity values. Impacts on critical habitats require the achievement of a net gain in biodiversity values.

In relation to achieving no net loss for natural habitats, the following definition applies:

> *"No net loss means a target for a development project in which the impacts on biodiversity caused by the project are balanced or outweighed by measures taken to avoid and minimise the project's impacts, to undertake on-site restoration and finally to offset the residual impacts, so that no loss remains."*

In relation to achieving net gain for critical habitats, the following definition applies:

> *"Based on the no net loss definition, a biodiversity net gain means that the measures taken to protect and restore biodiversity values significantly exceeds the loss."*

This section calculates the requirements for achieving no net loss/net gain, including calculating the requirements for biodiversity offset for significant residual impacts.

3.3.2.2 Mitigation Hierarchy

According to IFC PS6, the Project is expected to fully exercise the mitigation hierarchy (Figure 2). To implement the mitigation hierarchy with respect to Performance Standard 6, an assessment of the project's area of influence within the existing landscape, including associated facilities, can inform the identification, screening, and design of alternatives as a form of avoidance[3]. Mitigation measures should be designed or reviewed by appropriate biodiversity and engineering specialists to ensure that mitigation has been optimized in accordance with the mitigation hierarchy.

To compensate for significant residual impacts on biodiversity, and only after the prior steps in the mitigation hierarchy have been assessed and, where possible, undertaken, the client may consider the use of biodiversity offsets.

Avoidance	Measures taken to prevent irreplaceable loss of biodiversity or associated ecosystem services. Alternatives include site selection, design and scheduling.
Minimisation	Reduce or minimise the duration, intensity and/or extent of any impact that are not feasibly avoidable. Alternatives include physical controls, operational controls and abatement control.
Remediation	Where disturbance to biodiversity or ecosystem services has occurred, remediation may be possible in the form of rehabilitation and restoration. Alternatives include re-establishing habitat types, re-establishing biodiversity values and re-establishing ecosystem services.
Offsets	Offset or compensate for any residual impacts that cannot be avoided, minimised, or remedied on site. These include restoration offsets and averted loss offsets.

Figure 2 Mitigation Hierarchy

[3] IFC GN6, paragraph GN16

3.4 Other Applicable Standards, International Conventions and Treaties Relevant for Biodiversity Conservation

3.4.1 Convention on Biological Diversity

The UNEP Convention on Biological Diversity (CBD) entered into force on 29 December 1993. It has three main objectives:

- The conservation of biological diversity.
- The sustainable use of the components of biological diversity.
- The fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

Turkey has been a Party to CBD since 1992. The Ministry of Agriculture and Forestry Natural Resources and Environment established Turkish National Biodiversity Action Plan for the period 2018-2028. The document identifies objectives, actions and monitoring mechanisms for the conservation and sustainable use of biodiversity in accordance with developments in the new period, such as:

1. Identify the pressures and threats on biodiversity and ecosystems and reduce them to the possible lowest level or to remove them totally;
2. Biological diversity components (ecosystem, species and genetic variability) will be determined, monitored, and species specific and ecosystem based conservation approaches (traditional and modern) will be developed by determining current condition of biodiversity;
3. Conservation and sustainable management of biodiversity of areas exposed to agriculture, forestry and fishing activities in the country will be ensured;
4. Awareness of the public and administrators on ecosystem services will be raised, benefits from ecosystem services will be increased and sustainable biodiversity management will be ensured;
5. Rehabilitation and restoration of ecosystems damaged due to different reasons will be ensured, measures to prevent damage to healthy ecosystems will be developed and legislative gaps thereon will be fulfilled;
6. In order to develop high added value products based on knowledge and technology concerning conservation and sustainable use of biological resources, coordination mechanism among universities, public and private sectors will be established, and long-term plans and programmes will be prepared; and
7. National legislation will be prepared considering the international conventions on access to genetic resources and fair and equitable sharing of the benefits arising from their utilization, and the necessary technical infrastructure will be established.

4. MAIN FINDINGS OF BIODIVERSITY BASELINE; IMPACT ASSESSMENT AND CRITICAL HABITAT ASSESSMENT

The following sections 4.1 to 4.4 describe the main findings of the baseline study and the critical habitat assessment, and the results of the impact assessment (section 4.5) of CH- and PBF-features.

4.1 Key Biodiversity Areas

The proposed route runs through two internationally recognised areas (shown in Figure 3 and detailed in Table 2). These areas are not designated by national legislation but are considered to contain sensitive habitats, which are ecologically important. Both are considered Critical Habitat.

Table 2 Key Biodiversity Areas associated to the Project area

Areas	Distance from the Project	Summary
Key Biodiversity Areas		
Küçükçekmece Basin – Important Bird Area (IBA) and Key Biodiversity Area (KBA)	0 km (overlaps)	▪ The site is a natural brackish lagoon and qualifies as an IBA for holding in excess of 20,000 waterbirds in winter, and for winter great cormorant (*Phalacrocorax carbo* - LC) and passage pygmy cormorant (*Microcarbo pygmaeus*- LC). ▪ The site is characterized by the presence of numerous infrastructures and construction surrounding the water body. A motorway already crosses the IBA north of the main lagoon, and south of the proposed route. ▪ Most of the breeding activity of waterbirds within the site occurs at the Küçükçekmece lagoon, 6 km south of the proposed project route. ▪ The area of influence of the project within the IBA is formed mainly of modified habitats, with the exception of the Black Sea Garrigue.
West İstanbul Grasslands – Important Plant Area (IPA)	0 km (overlaps)	▪ The IPA comprises the remaining fragments of limestone grassland, rock outcrops and dry acid heath grassland, situated on the low hills north-west of Istanbul. The site hosts 19 threatened flora species, seven of which are endemic to the area. ▪ The part of the study area that falls into the IPA is already heavily disturbed and transformed by urban development, including the “Northern Marmara Motorway” (NMM) and adjacent residential area, and transitional weeds, a modified habitat. ▪ The part of the IPA potentially affected by the Project is not considered able to support the 19 threatened flora species anymore.

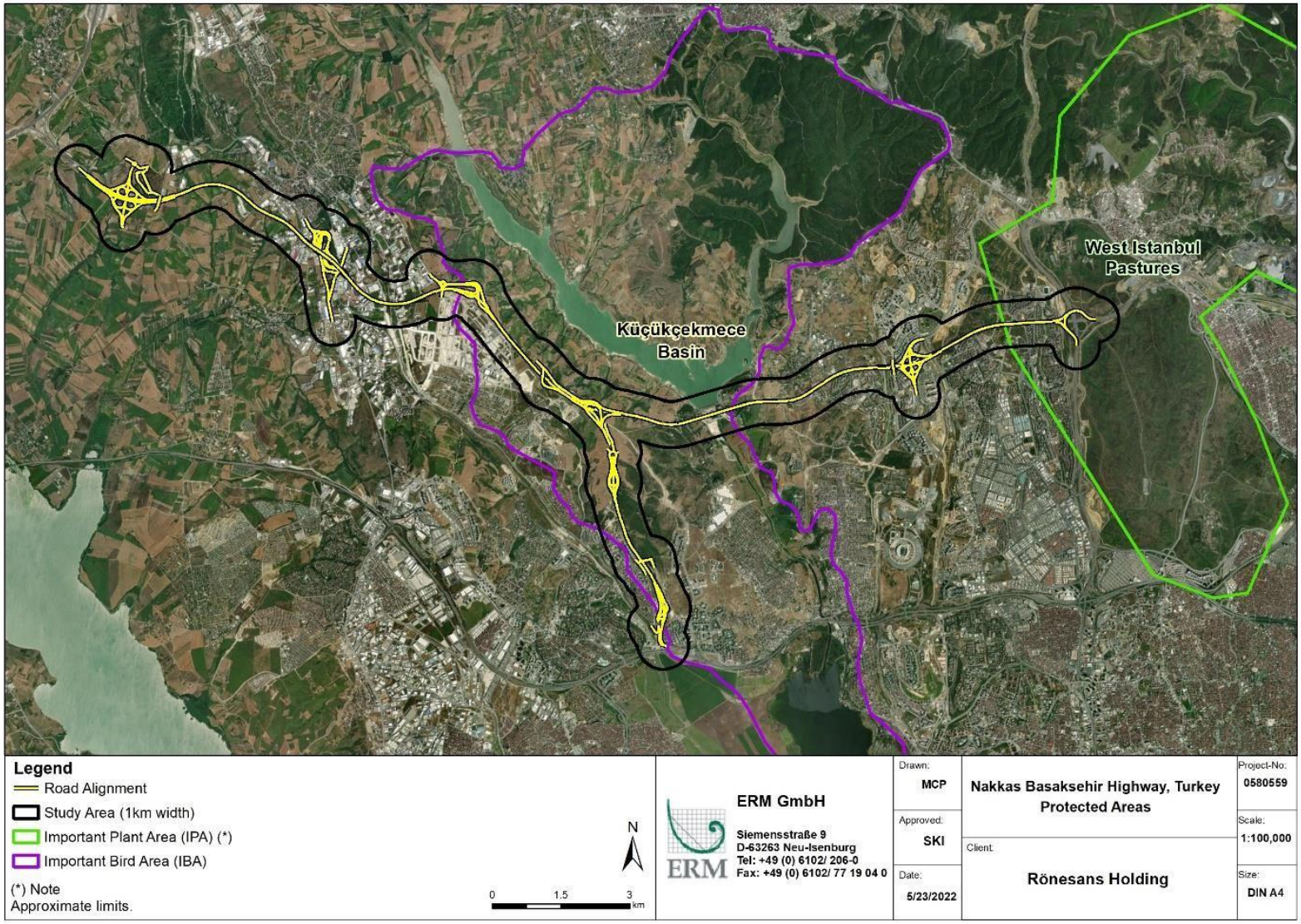


Figure 3 Sensitive Areas overlapping with the project area

4.2 Species of Conservation Interest

The species of conservation concern are those that are listed as globally, nationally or regionally threatened, those listed as CR, EN or VU in the IUCN red list of species, those that are endemic of the area, those included in the Resolution 6 of the Bern Convention, those considered as range restricted species or those migratory species which populations in the area constitute more than 1% of the world population. It must be noted that Since Turkey is not a member state of the European Union, the PR6 criteria for PBF/CH addressing the Habitats Directive and Birds Directive do not apply in this case.

The following subsections introduce the different species of conservation concern considered as potentially present within the Study Area as per the results of the ESIA and the updated CHA and based on the criteria indicated above. These updates incorporate findings from “Before Construction Biodiversity Baseline Report, 2023” and “Additional Bat Survey Study Report, 2024” conducted by the client. The list of species is summarized in Table 3 at the end of this section.

4.2.1 Flora

A total of 255 flora species and subspecies were recorded during the surveys conducted in February, May and September 2021. For the conservation status, while three plant species are not listed in IUCN Red List all of them are included in the National Red List of Turkish Plants; *Cirsium polycephalum* [nationally CR]; *Galanthus x valentinei* [nationally VU] and *Ferulago confusa* [nationally VU]. The first two species are also endemic (Table 3). *Cirsium polycephalum* has been identified as a Critical Habitat feature (qualifying species); whereas *Galanthus x valentinei* as a Priority Biodiversity Feature (PBF) qualifying species.

Additionally, further botanical surveys were conducted as part of the “Before Construction Biodiversity Baseline Report” at 17 survey points in November and December 2023. These additional surveys identified a total of 100 plant species, most of which align with findings from the ESIA. Among these, three important plant species were considered for the CHA. Two of these species (*Cirsium polycephalum, Ferulago confusa*) were already included in the current CHA and BAP; however, they were recorded at additional locations within the project area during additional surveys. The newly identified location is situated near the points identified during ESIA studies and are observed to support similar habitats (Figure 4). This suggests that the populations of these species may be larger than initially estimated during the ESIA phase. Furthermore, one plant species (*Gypsophila glomerata,* VU nationally) was recorded for the first time within the project area. *Galanthus x valentinei* which was recorded in Mediterranean riparian woodland during ESIA studies, was re-found in a new location (see Figure 5) by the EPC Biodiversity Expert in 2025 within the *Spartium junceum* fields. The population in this location is estimated to be approximately 250-300 individuals which is higher than the population identified during the ESIA studies.

Within the road project expropriation corridor, and outside areas subject to direct project intervention, approximately 89.72 ha of modified habitat consisting of intense unmixed crops has been identified. Following expropriation, these areas will provide opportunities for the re-establishment of natural habitats supporting PBF habitats and Critical Habitat trigger species, particularly Cirsium polycephalum. In addition, upon completion of construction activities, approximately 156.31 ha of newly created embankment areas will become available for habitat restoration and recreation measures. The combined area provides sufficient capacity to implement biodiversity offset and restoration measures within the project boundaries, supporting the objective of achieving at least No Net Loss and preferably Net Gain for biodiversity.

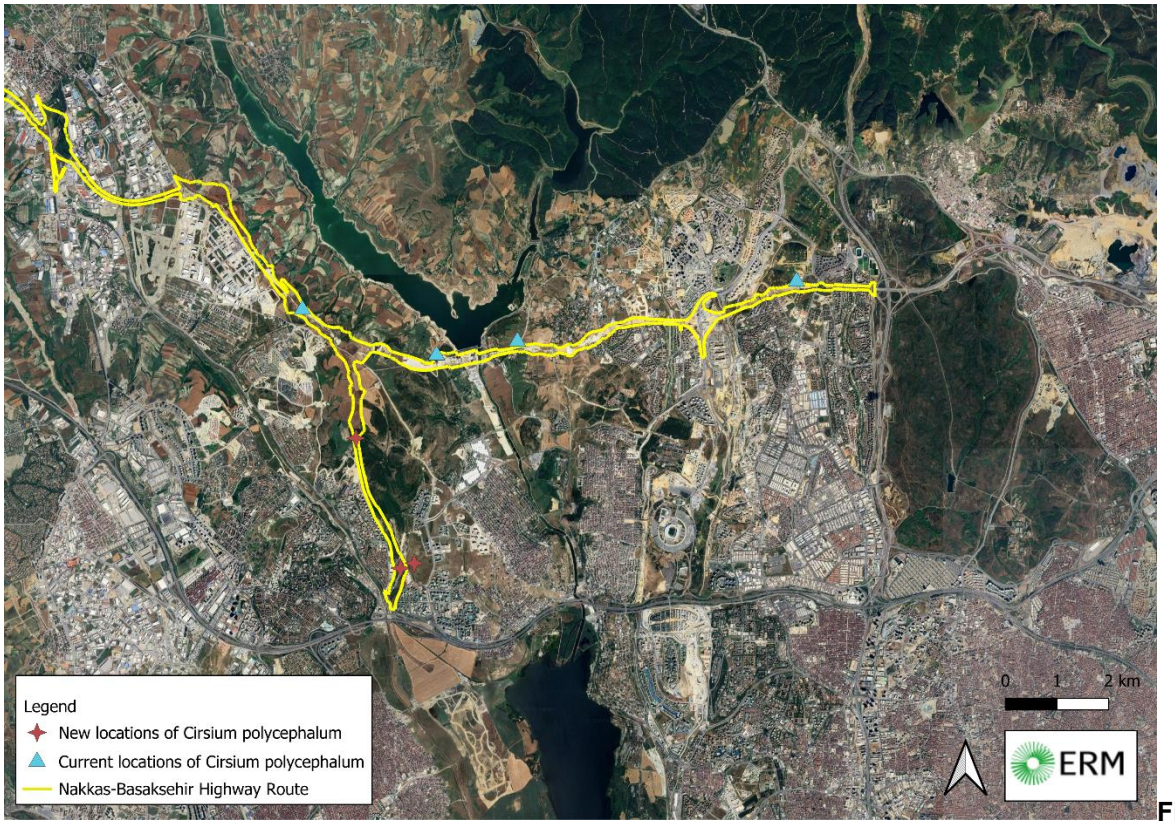


Figure 4. *Cirsium polycephalum* locations around the Highway route including those identified in the ESIA (current locations) and those from recent pre-construction surveys ('new locations').

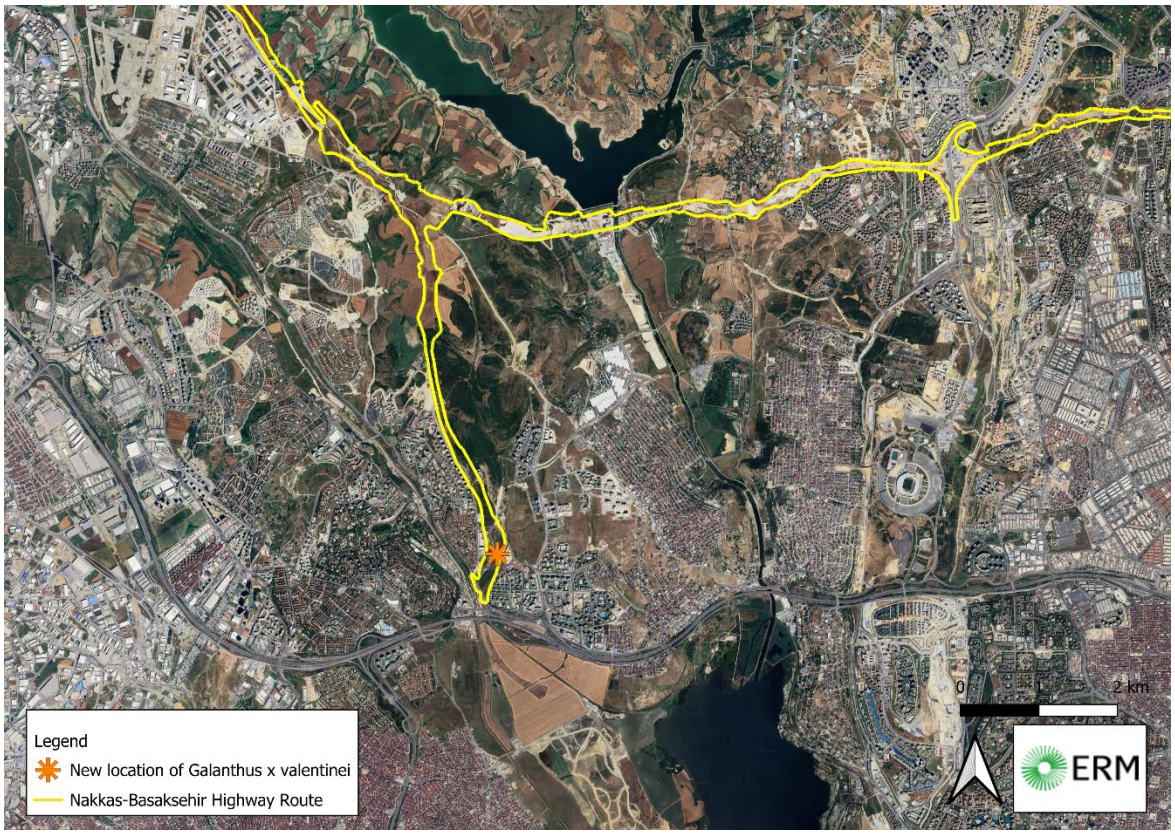


Figure 5. *Galanthus x valentinei* locations around the Highway route ('new location')

4.2.2 Birds

The Study Area, lying within the Bosphorus migration corridor for avifauna is considered to host, either as residents or on passage, up to 256 different bird species, 81 of which were species directly observed at the Project site. The list includes three Endangered species: the White-headed duck (*Oxyura leucocephala*), Egyptian vulture (*Neophron percnopterus*) and Steppe eagle (*Aquila nipalensis*), and five classed as Vulnerable (Table 3). For none of the rest of the migratory species, numbers exceeding 1 % of the global population were recorded during the surveys, and therefore they are not considered as species of conservation interest.

As a part of additional pre-construction field surveys/studies conducted in November and December 2023 (Before Construction Biodiversity Baseline Report, 2023), field surveys were carried out at 17 survey points, including those covered during ESIA studies. A total of 259 bird species were recorded in the Project area through direct observations as well as findings from the ESIA and literature reviews. The majority of the species identified were consistent with those recorded during the ESIA studies. Upon detailed examination of species diversity, no additional species qualified as CH or PBF were identified. Consequently, no changes have been made to the CHA and BAP inventories concerning birds.

The following globally threatened birds were found to qualify as PBFs:

- Egyptian Vulture (EN)
- Steppe Eagle (EN)
- White-headed Duck (EN)
- Common Pochard (VU)
- Eastern Imperial Eagle (VU)
- Red-Breasted Goose (VU)
- European Turtle-dove (VU)

In addition, 79 non-threatened species of birds (74 of LC, 5 NT species) were identified as PBFs (refer to the CHA for the full list).

4.2.3 Mammals

According to the location of the Project site and general habitat type, 58 mammal species were considered potentially present within the Study Area in accordance with ESIA studies. Main mammal group within are the bats with eleven different species recorded in the surveys, including three species of conservation concern (Table 3) classed as vulnerable Greater noctule bat (*Nyctalus lasiopterus)*, Long-fingered bat (*Myotis capaccinii)* and Mehely's Horseshoe Bat *(Rhinolophus mehelyi*). No other mammals were directly observed in the field, and none are considered endemic, though two species potentially present are considered of conservation concern: the Endangered European souslik/Ground squirrel (*Spermophilus citellus*), and the Vulnerable Marbled polecat (*Vormela peregusna*). Both species as well as the Long-fingered bat, Giant Noctule and Mehely's Horseshoe Bat were found to qualify as PBFs.

As a part of the "Before Construction Biodiversity Baseline Report", mammal studies (including bats) were conducted, identified a total of 59 mammal species. The majority of these species were determined through literature review and are consistent with those identified during ESIA studies. Additionally, the "Additional Bat Survey Study" included fieldwork has undertaken in May 2024 at 16 survey points over four nights, during which five bat species were recorded. All of these bats had already been considered in the ESIA studies and are included in the existing CHA and BAP. Consequently, no changes were deemed necessary for the BAP regarding mammal species.

4.2.4 Reptiles and Amphibians

As a result of the ESIA studies, a total of 9 amphibian and 28 reptile species are considered to be potentially present within Study Area, of which 11 reptiles and only one amphibian (Marsh frog, LC) were actually recorded during surveys. The amphibian species potentially present are not endemic and not listed in threatened categories of IUCN and therefore are not considered of conservation concern. Within the reptiles, none are endemic and only one species is considered of conservation concern based on its IUCN status: the Common or Mediterranean Spur-thighed Tortoise (*Testudo graeca*) listed as Vulnerable and was found to qualify as a PBF (Table 3). European pond turtle (*Emys orbicularis)* is regarded as Near Threatened according to IUCN.

Similarly, amphibian and reptile studies conducted as part of the "Before Construction Biodiversity Baseline Report" identified seven amphibian and 27 reptile species. Almost all of these species were determined based on findings from literature and the ESIA studies. None of the additional species were identified as qualifying as Critical Habitat (CH) or Priority Biodiversity Feature (PBF), and therefore no new species have been included in the updated BAP.

4.2.5 Fish

A total of nine fish species were recorded through specific surveys, none of which are classified as species of conservation concern according to their IUCN status. Therefore, none of the recorded fish species have been considered in the Critical Habitat Assessment (CHA).

Table 3 Species of conservation interest in the Project area

Species	IUCN Status	Additional notes
Flora		
Cirsium polycephalum	CR (nationally)	▪ Endemic to the Marmara region ▪ Directly observed in the field
Galanthus x valentinei[4]	VU (nationally)	▪ Endemic to the Thrace region ▪ Directly observed in the field
Ferulago confusa	VU (nationally)	▪ Directly observed in the field ▪ Rare species in Türkiye
Gypsophila glomerata	VU (nationally)	▪ Directly observed in the field ▪ Rare species in Türkiye
Birds		
Neophron percnopterus	EN	▪ Bern Convention (Resolution 6 – R6) ▪ Passage migrant
Streptopelia turtur	VU	▪ Directly observed in the field ▪ Breeding range includes the Study Area
Clanga clanga	VU	▪ Passage migrant
Aquila heliaca	VU	▪ Bern Convention (R6) ▪ Passage migrant
Aythya ferina	VU	▪ Winter visitor
Branta ruficollis	VU	▪ Bern Convention (R6) ▪ Winter visitor
Aquila nipalensis	EN	▪ Bern Convention (R6)

[4] Given the abundance of similar habitats along the connection route, which was originally planned but later cancelled, as well as within the impact area, including the species in the assessment ensures a more accurate and precautionary approach to its conservation. Moreover, following the cancellation of the connection road, the importance of retaining this species in the biodiversity assessment has also been emphasized in the ESIA. In addition it was re-found in a new location within *Spartium junceum* fields.

Species	IUCN Status	Additional notes
Oxyura leucocephala	EN	▪ Bern Convention (R6)
Mammals		
Spermophilus citellus	EN	▪ Bern Convention (R6)
Nyctalus lasiopterus	VU	▪ Bern Convention (R6) ▪ Directly observed in the field
Myotis capaccinii	VU	▪ Bern Convention (R6) ▪ Directly observed in the field
Vormela peregusna	VU	▪ Bern Convention (R6)
Rhinolophus mehelyi	VU	▪ Bern Convention (R6) ▪ Directly observed in the field
Reptiles		
Testudo graeca	VU	▪ Bern Convention (R6) ▪ Directly observed in the field

4.3 Natural/ Modified Habitat

The extent of natural and modified habitats was assessed as part of the ESIA. The Critical Habitat Assessment used relevant Ecologically Appropriate Area for Analysis (EAAA) for the different habitats/species considered.

Modified habitat corresponded to terrestrial habitat types including:

- Water-fringing reedbeds and tall helophytes other than canes,
- Mediterranean Riparian Woodland,
- Coniferous Plantations,
- Intensive unmixed crops,
- other plantations,
- transitional weed, and
- urban and industrial areas

Natural habitat corresponded to terrestrial habitat types (though as already described, in various states of degradation) including:

- Maquis;
- *Spartium junceum* fields; and
- Black Sea garrigue.

The results identified that habitats within the expropriation corridor and its wider area (500 m buffer) corresponded mostly to modified habitat, whereas remnants of natural habitat types, though in a degraded state, composed the rest. Figure 5 below present the natural / modified habitats distribution.

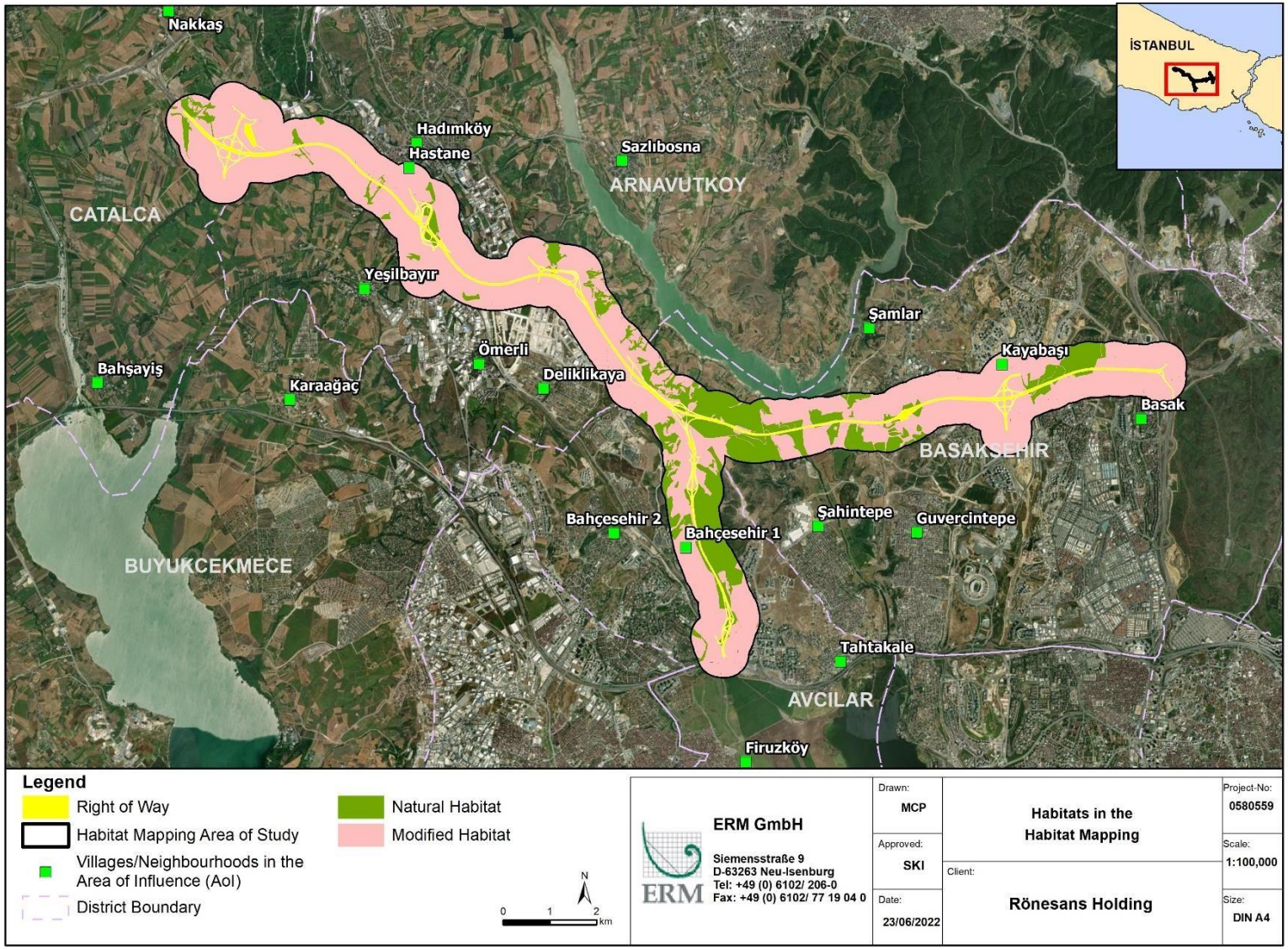


Figure 6 Natural and Modified Habitat Areas within the Project Area

4.4 Priority Biodiversity and Critical Habitat features

According to the Critical Habitat Assessment carried out for the project (ERM, 2022), the following features have been identified to match the criteria required to be considered as a Priority Biodiversity Feature (PBF) or Critical Habitat (Table 4).

Table 4 Critical Habitat Assessment result

Criteria	Trigger PBF/ Critical Habitat	Species/ habitat triggered
Criterion 2i: EAAA supports >0.5% of global population AND >5 reproductive units of a CR species	Critical Habitat	▪ *Cirsium polycephalum* (CR)
Criterion 1i g: EAAA is ecosystem determined to be of high priority for conservation by national systematic conservation planning		▪ West Istanbul Grasslands IPA
Criterion 2iii b: EAAA sustains, on a cyclical or otherwise regular basis, ≥ 1% of the global population at any point of the species' lifecycle		▪ Küçükçekmece IBA/KBA
Criterion 1.i : Ecosystems / habitats listed in terms of Resolution 4 of Bern Convention	PBF: qualifying habitats	▪ Water-fringing reedbeds and tall helophytes other than canes (Eunis code C3.2) ▪ Moeso-Thracian mesophile hay meadows (Eunis code E2.252) ▪ Mediterranean Riparian Woodland (Eunis code G1.3)
Criterion 2ia : EAAA for Bern Convention Resolution 6 (R6) species and **Ctiterion 2i.g** : EAAA supports VU species	PBF: qualifying species	▪ *Vormela peregusna* (VU) ▪ *Rhinolophus mehelyi* (VU)
Criterion 2i.f : EAAA supports <0.5% of global population of EN species / and R6 species		▪ *Spermophilus citellus* (EN)
Criterion 2ia : EAAA for R6 species and 2i.g – EAAA supports VU species		▪ *Myotis capaccinii* (VU) ▪ *Rhinolophus mehelyi* (VU) ▪
Criterion 2iia : EAAA for regularly occurring range-restricted species		▪ *Galanthus x valentinei* (VU)
Criterion 2i.g : EAAA supports VU species and/or **Criterion 2i.e :** Species listed in terms of Resolution 6 of Bern Convention		▪ *Aquila heliaca* (VU) ▪ *Aythya ferina* (VU) ▪ *Streptopelia turtur* (VU)
Criterion 2i.e : Species listed in terms of Resolution 6 of Bern Convention		▪ *Neophron percnopterus* (EN) ▪ *Branta ruficollis* (VU) ▪ *Aquila nipalensis* (EN) ▪ *Oxyura leucocephala* (EN) ▪ *Nyctalus lasiopterus* (VU) ▪ *Myotis capaccinii* (VU)

Criteria	Trigger PBF/ Critical Habitat	Species/ habitat triggered
		▪ An additional 93 fauna species (NT, LC, DD) qualify as PBFs based on their listing in terms of Resolution 6 of the Bern Convention: - 79 birds (74 LC species, 5 NT species); - 10 mammals (5 of LC, 5 NT, including bats and small mammals); - one amphibian (LC); - two reptiles (one of LC, one NT); - one species of fish (LC)

4.5 Impact Assessment

The impacts on the different PBF and Critical habitats identified, have been assessed and documented as part of the ESIA (Table 5), with an additional specific attention based on current conditions of each of them as well as on the particularities of the areas to be potentially affected, within the CHA. These threats to biodiversity are derived from IFC PS 6 and relate to the activities that are likely to occur during the construction and operation phases.

Provided the correct implementation and successful outcome of the proper mitigation measures considered in these documents, the residual impacts identified on these features have been overall assessed to be not significant (i.e. negligible-minor significance); whereas during the operational phase, moderate (i.e. significant) residual impacts are expected under a precautionary approach for effects of air quality/pollution on flora/habitat features.

However, it has been considered key for the purpose of this document to ensure a proper restoration of the affected critical habitats supporting the species *Cirsium polycephalum*, and as such a habitat liability estimation methodology (Section 5.3.5) has been applied to these habitats and associated species.

Table 5 Impact Assessment results of Critical Habitat (CH) and Priority Biodiversity Features (PBF)

Feature	CH	PBF	Applicable Impact description (from ESIA)	ESIA residual impacts	Additional Requirements under BAP? (Y/N)
West Istanbul Grasslands IPA	X	-	Construction: ■ Direct habitat loss/degradation will occur due to construction impacts, 13,87 ha is overlapped by development footprint. The part of the study area that falls into the IPA is already heavily disturbed and transformed by urban development, including the "Northern Marmara Motorway" (NMM) and adjacent residential area, and transitional weeds, a modified habitat.	Minor	Y, additional mitigation described for IPA area to align with at least a NNL objective (see approach in section 5.3.1 and actions/steps in Table 9)
			Operational: ■ An increase in NOx and acid deposition is known to damage sensitive plants and promote changes in species composition to more nitrogen hungry plant communities.	Moderate	
Küçükçekmece Basin – Important Bird Area (IBA) and Key Biodiversity Area (KBA)	X	-	Construction: ■ Direct habitat loss/degradation will occur due to constructional impacts; 207.86 ha is overlapped by development footprint. ■ The site is a natural brackish lagoon and qualifies as an IBA for holding in excess of 20,000 waterbirds in winter, and for winter great cormorant (*Phalacrocorax carbo* - LC) and passage pygmy cormorant (*Microcarbo pygmaeus* - LC). ■ The site is characterized by the presence of numerous infrastructures and construction surrounding the water body. A motorway already crosses the IBA north of the main lagoon, and south of the proposed route. ■ Most of the breeding activity of waterbirds within the site occurs at the Küçükçekmece lagoon, 6 km south of the proposed project route. ■ The area of influence of the project within the IBA is formed mainly of modified habitats, with the exception of the Black Sea Garrigue.	Negligible	Y, additional measures described for the IBA/KBA to align with at least a NNL objective (see approach in section 5.3.2 and actions/steps in Table 9)
			Construction: ■ Disturbance by blasting is likely to disturb wintering species and may lead to temporary displacement of the wintering bird population.	Minor	

Feature	CH	PBF	Applicable Impact description (from ESIA)	ESIA residual impacts	Additional Requirements under BAP? (Y/N)
Habitats listed in Resolution 4 of Bern Convention:			Construction: ■ Construction will lead to permanent or long term habitat loss that will need to be compensated for. ■ No "Priority Habitat Types" listed in Resolution 4 of the Bern Convention are found. ■ The majority of habitat across the AoI is of modified, fragmented habitat such as non-irrigated arable land or discontinuous urban fabric. It is largely modified through human influence and consequently of reduced conservation interest. ■ The habitats present are not considered to be in good condition or representative for being designated as Emerald site (which is the purpose of their listing on Resolution 4 of the Bern Convention).	Minor (terrestrial) Negligible (aquatic)	Y, additional recommendations in BAP to compensate for permanent habitat loss predicted to align with No Net Loss objective for PBFs
1 Water-fringing reedbeds and tall helophytes other than canes 2 Moeso-Thracian mesophile hay meadows 3 Mediterranean Riparian Woodland			Operational: ■ Key risks and impacts will be initiated during the construction phase as a result of habitat loss and fragmentation, which will extend into operation as permanent or long term impacts that will require mitigation.	Minor (terrestrial) Negligible (aquatic)	
Common Pochard (*Aythya ferina*)	-	X	Construction: ■ The species has been recorded as a winter visitor on the Küçükçekmece Lake IBA/KBA, the EAAA is likely to have some important function in maintaining or supporting the species' population. ■ Loss of habitat for Revised Annex I of Resolution 6 of the BERN Convention species, including several threatened species. ■ Highest risks of impact during works in proximity to Sazlidere dam where disturbance and blasting may cause temporary displacement of wintering and passage birds.	Minor (for all birds)	Y, habitat restoration/creation to align with No Net Loss objective for PBFs in support of improved waterbird species and respective habitat conservation efforts in the Küçükçekmece Basin IBA/KBA (see approach in section 5.3.2 and actions/steps in Table 9)

Feature	CH	PBF	Applicable Impact description (from ESIA)	ESIA residual impacts	Additional Requirements under BAP? (Y/N)
White-headed Duck (*Oxyura leucocephala)*	-	X	Operational: ■ Threatened PBF qualifying birds (EN, VU) are passage migrants or winter visitors with known breeding ranges overlapping with the study area in many instances. ■ Most bird species in the study area are small and agile, and therefore highly adaptable regarding their flight height and manoeuvrability and are therefore likely to avoid collision with the bridge infrastructure on the majority of occasions. ■ Key species that may be at risk of collision include the larger, less manoeuvrable species that are also nocturnal migrants and species or locally active and dispersive at night and those where the period of migration may coincide with the winter/autumn seasons conducive to inclement weather associated with poor visibility ■ There will still be sufficient room for birds to fly around, over or under the bridge structure and the bridge length will be sufficient to provide for effective bird movement beneath the structure over a relatively broad area. 'Minor' residual impact rating to reflect the potential uncertainty regarding bridge collision risks in general in light of: (i) a general lack of rigorous studies and scientific literature on the subject, with key arguments being largely unsupported in the literature; and (ii) certain unknowns as to how effective bridge design mitigation will be in reducing potential collision risk. Due to the height of the bridge birds will still be able to fly around, under or over it.	Minor (for all birds)	N, bridge risks addressed through appropriate bridge design mitigation and operational rules, as per ESIA
Egyptian Vulture (*Neophron percnopterus)*	-	X			
Eastern Imperial Eagle (*Aquila heliaca)*	-	X			
Red-Breasted Goose (*Branta ruficollis)*	-	X			
Steppe Eagle (*Aquila nipalensis)*	-	X			

Feature	CH	PBF	Applicable Impact description (from ESIA)	ESIA residual impacts	Additional Requirements under BAP? (Y/N)
European souslik (*Spermophilus citellus*)	-	X	Construction: ■ Construction would lead to permanent habitat loss. Disturbance during construction, and fragmentation associated with that disturbance could affect populations up to 1km distance. Areas of blasting activities could affect populations up to 2km distance. Operational: ■ Risks of direct collision mortality, and fragmentation of populations and opportunities to complete life cycles. ■ Barrier effect to species movement. Pollution of water courses may reduce food resource for species.	Minor (for all mammals)	Y, additional recommendations in BAP for habitat restoration/creation to align with No Net Loss objective for PBFs
Marbled polecat (*Vormela peregusna)*	-	X			
Mehely's Horseshoe Bat *(Rhinolophus mehelyi)*	-	X	Construction: ■ Construction would lead to permanent habitat loss ■ Disturbance during construction, and fragmentation associated with that disturbance could affect populations up to 1km distance. Areas of blasting activities could affect populations up to 2km distance. Operational: ■ Risks of direct collision mortality, and fragmentation of populations and opportunities to complete life cycles. Pollution of water courses may reduce food resource for species.	Minor (for all mammals)	N, mitigation present at ESIA level and wildlife crossings design recommendations to mitigate barrier effect are included in the CESMP
Long fingered bat (*Myotis capaccinii*)					
Giant noctule (*Nyctalus lasiopterus)*					

Feature	CH	PBF	Applicable Impact description (from ESIA)	ESIA residual impacts	Additional Requirements under BAP? (Y/N)
Mediterranean Spur-thighed Tortoise (*Testudo graeca)*	- -	X X	Construction: ■ Construction would lead to permanent habitat loss. ■ Disturbance during construction, and fragmentation associated with that disturbance could affect populations. ■ Impacts may also result from damage to the watercourses and ponds from silt and pollution during works and interruption of seasonal movements between watercourses and waterbodies, prevention completion of life cycle.	Minor (for all herpetofauna)	Y, additional recommendations in BAP for habitat restoration/creation to align with No Net Loss objective for PBFs
			Construction: ■ Construction would lead to permanent habitat loss. ■ Disturbance during construction, and fragmentation associated with that disturbance could affect populations. ■ Impacts may also result from damage to the watercourses and ponds from silt and pollution during works and interruption of seasonal movements between watercourses and waterbodies, prevention completion of life cycle.	Minor (for all herpetofauna)	Y, additional recommendations in BAP for habitat restoration/creation to align with No Net Loss objective for PBFs
Cirsium polycephalum	X	-	Construction: ■ Direct and indirect loss due to site clearance and dust deposition will occur in relation to all components of the project Direct habitat loss or degradation will occur. Although *Cirsium polycephalum* was initially estimated to be impacted at a national level by 0.4-0.6%, additional surveys revealed the presence of the species at new locations within the project area. However, specific population data for these new occurrences were not certain since the surveys were conducted out of season. The newly identified locations are in close proximity to the previously recorded ones, and therefore, it is not expected that the proportion of the national population impacted will exceed the initially estimated 0.4-0.6%.	Negligible	Y, additional mitigation described for *C. polycephalum* to align with Net Gain objective for Critical Habitat
			Operational: ■ NOx and acid deposition may affect habitats up to 2km from the motorway depending on their sensitivity. Habitats within this 2km range could be damaged by declines in air quality resulting in the decline of the plant communities. ■ Direct and indirect loss due to site clearance and dust deposition will occur in relation to all components of the project.	Moderate (all flora species)	

Feature	CH	PBF	Applicable Impact description (from ESIA)	ESIA residual impacts	Additional Requirements under BAP? (Y/N)
Snowdrop *(Galanthus x valentinei)*	-	X	Construction: Direct habitat loss or degradation will occur. Habitat loss and construction activities may result in the loss of small proportion (a peak of 0.4-0.6%) of the national population.	Negligible	Y, additional mitigation described for *G. x valentinei* to align with No Net Loss objective for PBFs
			Operational: ▪ NOx and acid deposition may affect habitats up to 2km from the motorway depending on their sensitivity. Habitats within this 2km range could be damaged by declines in air quality resulting in the decline of the plant communities.	Moderate (all flora species)	
Additional 93 fauna species (NT, LC, DD) qualify as PBFs based on their listing in terms of Resolution 6 of the Bern Convention: • 79 birds (74 LC species, 5 NT species) • 10 mammals (5 of LC, 5 NT, including bats and small mammals) • one amphibian (LC) • two reptiles (one of LC, one NT) one species of fish (LC)	-	X	Construction: ▪ Construction would lead to permanent habitat loss. ▪ Disturbance during construction, and fragmentation associated with that disturbance could affect populations. ▪ Impacts may also result from damage to the watercourses and ponds from silt and pollution during works and interruption of seasonal movements between watercourses and waterbodies, prevention completion of life cycle.	Minor (for all mammals) Minor (for all birds) Minor (for all herpetofauna) Negligible (for all fish)	Y, additional recommendations in BAP for habitat restoration/creation to align with No Net Loss objective for PBFs (see approach in section 5.3.2 and actions/steps in Table 9)
			Operational: ▪ Risks of direct collision mortality, and fragmentation of populations and opportunities to complete life cycles. ▪ Barrier effect to species movement. ▪ Potential risks from low level pollution from the road and low potential for a large-scale incident such as a lorry shedding a toxic load. Introduction of invasive species can put pressure on remaining species, particularly within aquatic environment.		N, mitigation present at ESIA level and wildlife crossings design recommendations to mitigate barrier effect are included in the CESMP

5. BAP RESULTS – ENVIRONMENTAL LIABILITIES

5.1 Habitat Types within the Project Area

5.1.1 Updated Habitat Mapping

The habitat mapping performed for the development of this BAP and the CHA has been based on previous works developed for the ESIA and completed with an additional habitat survey and ground- truthing exercise completed by ERM in May 2022. This survey has been performed over a Study Area of a 500m radius buffer of the road RoW, where all habitats have been identified and classified following the European Nature Information System (EUNIS).

Habitat detection, identification and mapping were carried out by integrating information from satellite imagery (mainly Google Earth) with an exercise of ground-truthing in the field completed by ERM in May 2022 and completed with additional spatial data available (i.e. land use).

To the development of the updated habitat mapping along a buffer zone of 500 m around the RoW of the proposed route, the Corine Land Cover 2018 has been used as the base map. For this purpose, the Study Area selected was the expropriation corridor, as this area is where the terrain will be most affected. In addition to that corridor, the Study Area was extended with a buffer of 500 m on each side of the expropriation corridor.

The Study Area was then analysed and the polygons were adapted from the Corine Land Cover base map to adapt it to the current situation. A series of observation points were then selected in order to allow a further classification of the different types of habitats with the help of satellite images and the development of the field survey. The most important feature of this project is a polygon layer with information on habitats. It includes a legend stablished prior to fieldwork though modified in accordance with the field findings. The list of habitats in the area is presented in Table 6. The types of habitats identified were classified according to the European Nature Information System (EUNIS)[5].

The resulting updated habitat map is included in Appendix B to this report and introduced in the following subsection.

5.1.2 Habitat types

The proposed route for the Project mainly consists of residential and agricultural habitats. Areas of natural and semi-natural habitats of Mediterranean climate are also scattered along the proposed route. Wheat farming is the predominant activity in the agricultural areas. Natural and semi-natural areas consist of meadows, riparian habitats, garrigue habitats, and *Spartium junceum* (Spanish broom) communities. Natural and semi-natural habitats on the motorway route are non-continuous.

Table 6 presents all the habitats identified within the Study Area and classified according to the European Nature Information System (EUNIS), including those natural and those modified. Figure 6 presents the distribution of the different habitats along the Study Area.

Table 6 Habitat types associated to the Project area (*PBF habitats in Bold text)

Habitat type	Comments
C3.2: Water-fringing reedbeds and tall helophytes other than canes (PBF*)	▪ Considered to be a modified habitat which has formed artificially as a result of the excavation and straightening/canalization of a natural watercourse present before the construction of a dam. ▪ The dominant species of this habitat are bulrush (*Typha latifolia*), common reed (*Phragmites australis*), fat duckweed (*Lemna gibba*), soft rush (*Juncus*

[5] European Environment Agency (2004) *European Nature Information System (EUNIS)*. Last accessed 24/05/2021 EUNIS habitat classification — European Environment Agency (europa.eu)

Habitat type	Comments
	effusus), common club-rush *(Schoenoplectus lacustris),* Gypsywort *(Lycopus europaeus), Bidens tripartita* and *Senecio aquaticus.*
E2.252 - Moeso-Thracian mesophile hay meadows (PBF*)	▪ Not considered representative of natural hay meadows or grasslands which would be sustained naturally by several environmental and climatic drivers and is rather considered a secondary grassland type, and therefore a modified habitat. ▪ This habitat type is grazed heavily by cattle and goats/sheep with the dominant species being soft rush, *Ranunculus constantinopoliatanus,* ribwort plantain (*Plantago lanceolata*), hemlock (*Conium maculatum*), blessed thistle (*Silybum marianum*), radish (*Raphanus raphanistrum*), cutleaf teasel (*Dipsacus laciniatus*), alfalfa (*Medicago sativa*), cat grass (*Dactylis glomerata*), and Bermuda grass (*Cynodon dactylon*).
F5.2 Maquis	▪ Natural habitat with a degree of modification as all similar Mediterranean habitat by human management (grazing, fires, etc) dominated by the common Kermes oak (*Quercus coccifera*). ▪ Important plant species include *Cirsium polycephalum*, a regionally endemic species classified globally as Critically Endangered (CR) by IUCN, and *Ferulago confusa*, (Vulnerable), which are both distributed throughout the habitat.
F5.4 *Spartium junceum* Fields	▪ The dominant species of this natural habitat with a degree of modification as all similar Mediterranean habitat by human management (grazing, fires, etc) is Spanish broom (*Spartium junceum*) with other species present including cat grass, bracken (*Pteridium aquilinum*), dog rose (*Rosa canina*), osyris (*Osyris alba*), butcher's broom (*Ruscus aculeatus*), smilograss (*Piptatherum miliaceum*) and yellow jasmine (*Jasminum fruticans*). ▪ The regionally endemic *Cirsium polycephalum* can also be found within this habitat. ▪ The regional endemic snowdrop (*Galanthus x valentinei*) can be found within this habitat, this species is assessed as VU.
F6.4 Black Sea Garrigue	▪ Natural habitat with a degree of modification as all similar Mediterranean habitat by human management (grazing, fires, etc., where the dominant species are pink rock rose (*Cistus creticus*), sage-leaved rock rose (*Cistus salviifolius*), green olive tree (*Phillyrea latifolia*), Turkey oak (*Quercus cerris*) and tree heath (*Erica arborea*). ▪ Important plant species include *Cirsium polycephalum* (Endemic and CR), and *Ferulago confusa*, (VU) which are both distributed throughout the habitat.
G1.3 Mediterranean Riparian Woodland (PBF*)	▪ Considered as a modified habitat due to the high level of modification that has taken place as a result of historical channel straightening and excavation. Main species include field elm (*Ulmus minor*), holy bramble (*Rubus sanctus*) and *Juncus heldreichianus.* ▪ The regional endemic snowdrop (*Galanthus x valentinei*) can be found within this habitat, this species is assessed as VU.
G3.F Highly Artificial Coniferous Plantations	▪ Modified habitat formed by plantations of black (*Pinus nigra*) and maritime pine (*Pinus pinaster*). Individuals of *Cirsium polycephalum* (CR) can be found in this habitat.

Habitat type	Comments
I1.1 Intensive Unmixed Crops	▪ Modified habitat formed by crops.
1.1 Residential Buildings of City and Town Centres (urban and industrial)	▪ Modified habitat dominated by the presence of human made infrastructures.
Plantations	▪ Modified habitat of non-coniferous plantations in the study area that have been artificially established.
Transitional Weeds	▪ Modified habitat formed by areas of land clearly disturbed, with signs of tillage from previous agricultural practices associated with crop cultivation, that now appear in a very early successional state.
Water body	▪ Open water bodies largely void of any emergent vegetation (apart from aquatic vegetation fringing water body edges and algal blooms in the water column), most notably Sazlidere dam. This is an artificial reservoir supplying water to Istanbul and provides habitat for waterbirds and fish mainly. Considered as a modified habitat.

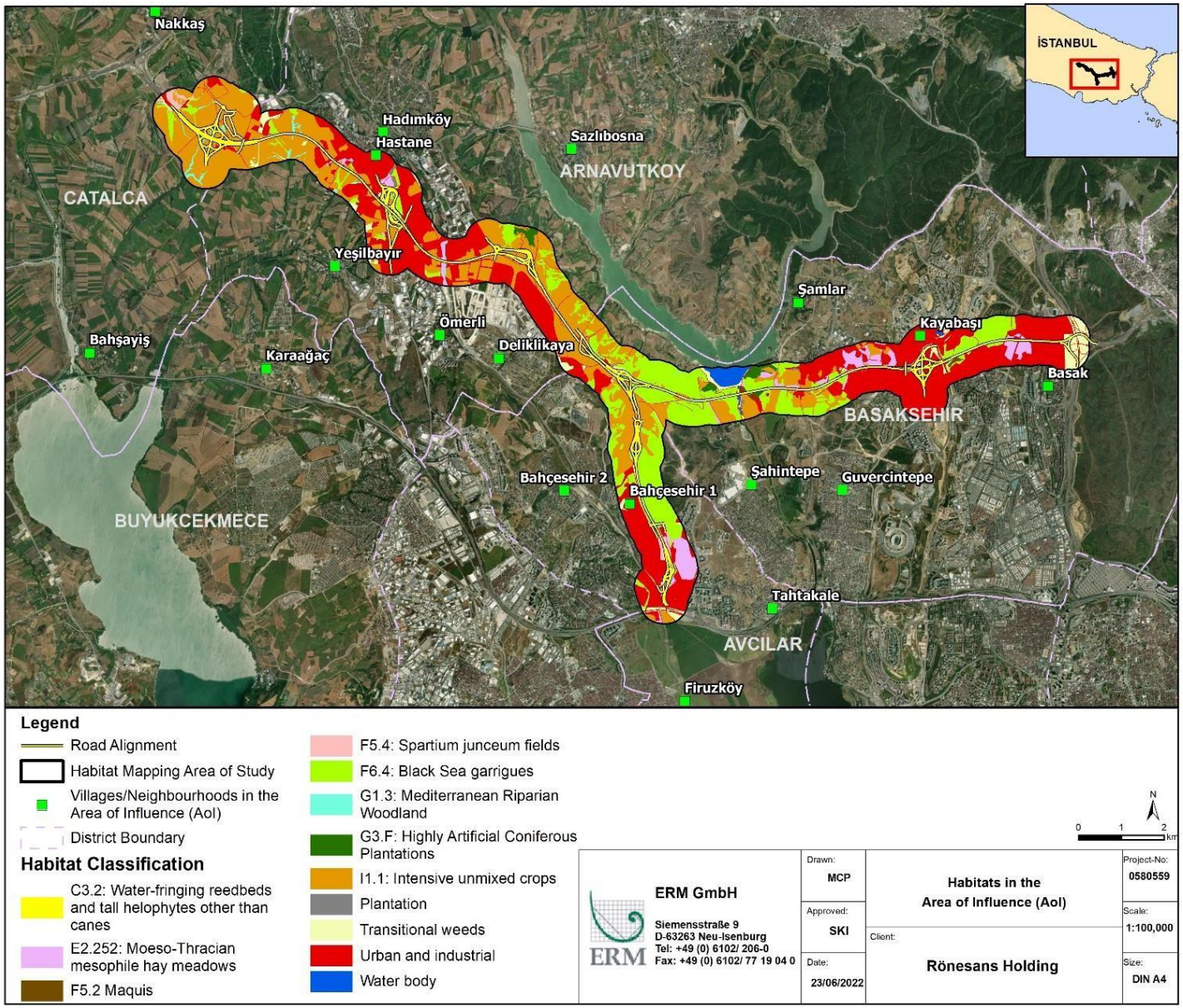


Figure 7 Habitat distribution along the Study Area

5.2 Natural/ modified habitat

According to the ESIA process, the residual environmental liability includes physical permanent habitat loss (Table 7) and ecological habitat loss.

Project components are located mostly on modified habitat; thus a no net loss requirement is applied for the loss of 83.59 ha occupied by Project footprint over natural habitats (where in addition, *Cirsium polycephalum* was identified).

Table 7 Area acquired for the Project's development

Type of habitat	Land uses	Total area (ha)
Modified habitat (Terrestrial habitat types including Water-fringing reedbeds and tall helophytes other than canes, Mediterranean Riparian Woodland, Coniferous Plantations, Intensive unmixed crops, other plantations, transitional weed, and urban and industrial)	**Permanent**	
	Road alignment	162.15
	Embankment areas	117.83
Natural habitat (Terrestrial habitat types including Maquis, *Spartium junceum* fields and Black Sea garrigues)	**Permanent**	
	Road alignment	45.11
	Embankment areas	38.48

The total area to be occupied by the project footprint on natural habitats is of 83.59 ha distributed in three different habitats: Maquis (0.11 ha), *Spartium junceum* fields (7.01 ha) and Black Sea garrigues (76.46 ha).

5.3 Critical Habitat and Priority Biodiversity Features

5.3.1 Loss of ecological function of Küçükçekmece Basin IBA and KBA

The Küçükçekmece Basin IBA and KBA site is a natural brackish lagoon with maximum depths of 20 m, that qualifies as an IBA for holding in excess of 20,000 waterbirds in winter, and for the presence of the winter great cormorant (*Phalacrocorax carbo*) and passage pygmy cormorant (*Microcarbo pygmaeus*). Fringe vegetation is confined to an area of reedbed (*Phragmites*) in the north of the lagoon. This lagoon is connected with the Sazlıdere reservoir located further north and that also belongs to the IBA, as well as the connecting terrestrial area.

The site is characterized by the presence of numerous infrastructures and construction surrounding the water body, the only relatively undisturbed area lying within the grounds of the nuclear energy research centre and military camp on the east shore. A motorway already crosses the IBA north of the lake.

Most of the breeding activity of waterbirds within the site occurs at the Küçükçekmece lagoon, 5 km south of the proposed project route, while at Sazlıdere reservoir (the dam is located 300m north of the proposed project within the IBA) there is minor breeding activity of water birds, mostly Common Tern (*Sterna hirundo*) and small groups of shorebirds on the islands in the reservoir (further north). The movement of waterfowl and shorebirds is commonly between the bodies of water in Sazlıdere and Küçükçekmece. Groups of cormorants, herons and gulls have been observed to fly in a north-south direction. The collision with moving vehicles is a possibility (albeit remote) for some commuting water birds.

Direct habitat loss or degradation of this site due to project activities is expected to occur on approximately 1.75% (207.86ha) of the IBA by the overlapping with the Proposal Development expropriation corridor and Batch areas. Some of these areas are already subject to disturbance from existing roads and severance, and existing quarry operations.

The main area of the IBA expected to be impacted by the Project is the Sazlıdere creek area (approx. 5 km upstream of the Küçükçekmece Lake) which will be spanned by a cable-stayed bridge. The area of influence of the project within this site is considered mainly of modified habitats, with the exception of the Black Sea garrigue. It is not expected that a significant collision risk by passing birds would arise from the stationary bridge.

Much of the effect of the Project is away from the natural brackish lagoon which supports main qualifying features of the IBA and therefore unlikely to have significant effect on those features, and therefore not requiring specific offset actions for this IBA/KBA. Also, species of waterbirds (including migratory and congregatory species) supported by aquatic habitats in the Küçükçekmece Basin IBA/KBA have typically been identified as PBFs in the CHA for the Project and not CH, and according to the KBA factsheet, the site does not meet global KBA criteria and thresholds, and this could support modifying the status of the KBA/IBA to PBF and not CH to better align with the EBRD classification criteria for CH/PBF.

A more realistic objective would be to achieve NNL at a minimum for the Küçükçekmece Basin IBA/KBA , and this is probably more practically achievable given that there are likely to be limited opportunities for delivering NG in this highly developed area with many existing local constraints and anthropogenic pressures. In ERMs opinion, NNL of biodiversity for the IBA/KBA could be delivered through a series of actions aimed at avoiding/minimizing impacts, restoring habitats for key species and then considering compensation where residual impacts still remain to key PBF waterbird species that utilize the aquatic habitats in the IBA/KBA. Such a phased approach is well-aligned with the mitigation hierarchy and is described in more detail in the approach, actions and steps in Table 9.

Specific restoration and conservation actions for the Küçükçekmece Basin IBA/KBA have been integrated into the Habitat Restoration Plan (HRP) implementation framework. These actions include habitat enhancement and restoration measures associated with ecologically suitable areas located within the expropriation corridor and newly formed embankment areas. The measures have been linked to restoration area identification, implementation methodologies, monitoring requirements and phased implementation timelines. The actions are intended to support habitat functionality and ecological connectivity within the wider landscape and contribute to the long-term conservation objectives associated with the IBA/KBA.

Consultation with Birdlife International (and any other relevant NGOs or conservation groups) is to be undertaken to discuss potential project impacts on the IBA and mitigation strategy. During the ESIA, attempts were made to reach out to BirdLife International (and the local partner in Turkiye, Doğa Derneği, for comment and engagement around the Project mitigation strategy, however there was no response within the timeframes of the ESIA. That being said, the BAP considers potential actions to engage with BirdLife/Doğa to investigate a specific action involving the possibility of the Project supporting the updating the currently outdated/inadequate management plan for the IBA/KBA (see the approach, actions and steps described further in Table 9).

The Habitat Restoration Plan (HRP) has been updated to provide the primary implementation framework for biodiversity management within the Project. In line with the Biodiversity Action Plan (BAP), the HRP defines detailed and implementable measures for both the Küçükçekmece Basin IBA/KBA and the West Istanbul Pastures IPA.

Within the KBA, the HRP adopts a landscape-scale restoration approach focusing on habitat rehabilitation, ecological connectivity, aquatic habitat enhancement, and water quality improvement, particularly in and around Sazlıdere Dam. Within the IPA, where large-scale habitat restoration opportunities are limited due to the degraded nature of the area, a species-based conservation approach is applied, including propagation, reintroduction, and long-term monitoring of priority flora species.

The HRP therefore acts as the key delivery mechanism for achieving No Net Loss (NNL) in the KBA and Net Gain (NG) in the IPA, ensuring that all restoration and conservation actions are spatially defined, technically detailed, and subject to monitoring and adaptive management. All actions are integrated into the HRP implementation framework, including location identification, technical methods, scheduling, and performance monitoring.

5.3.2 Loss of ecological function of West Istanbul Grasslands IPA

The Important Plant Area (IPA) of West Istanbul Grasslands comprises the remaining fragments of limestone grassland, rock outcrops and dry acid heath grassland, situated on the low hills north-west of Istanbul. The site hosts 19 threatened flora species, seven of which are endemic to the area.

Direct habitat loss or degradation is expected to occur along approximately 0.16% (13.87ha) of the westernmost area of the IPA on the area that is overlapped by the expropriation corridor and batch areas. This area is already considered largely to consist of modified habitat as it is located by the previous portion of the constructed "Northern Marmara Motorway" (NMM) and adjacent residential area. The habitat mapping performed identified that this area is dominated by urban and industrial areas and transitional weeds.

The part of the study area that falls into the IPA, however, is already heavily disturbed and transformed by urban development. This part is not considered able to support these species anymore, and therefore the Project footprint is not expected to affect the qualifying features of the site. As a result, no specific compensatory or offset actions for this site have been considered necessary. Given the current degraded status of the West Istanbul Grasslands IPA[6], the likely negligible impact[7] of the Project on habitats in the IPA and the fact that there are several limitations and constraints[8] to what can be achieved practically in terms of delivering NG for the habitats that will be impacted within the IPA, in ERMs professional opinion a more pragmatic approach to defining CH and NG objectives and actions for the IPA is needed. The recommended approach is to contribute to the reintroduction and conservation of important flora species that have already been lost from the IPA (due to external influences), through a structured conservation plan and program that can be linked to the Habitat Restoration/Recreation Plan (HRP) developed for the Project (requiring review and update), as detailed in the approach, actions and steps in Table 9.

For the West Istanbul Grasslands IPA, restoration and habitat enhancement measures will prioritise ecologically functional garrigue and maquis habitats that provide suitable long-term conditions for Cirsium polycephalum and associated biodiversity features. Restoration efforts will focus on improving habitat quality, ecological functionality and habitat continuity rather than solely targeting areas where the species is currently present. This approach aligns with the objective of achieving Net Gain through the restoration of ecologically resilient habitats capable of supporting long-term species persistence.

5.3.3 Loss of habitat supporting the species *Cirsium polycephalum*

The Project is expected to directly affect the critical habitat supporting species *Cirsium polycephalum*.

Cirsium polycephalum was recorded during field surveys within different habitat types: Black Sea garrigue habitat, *Spartium junceum* fields, Maquis habitat, and the modified habitat of coniferous plantations.

The population of this species within the Study Area was 2,020 individuals recorded across four sampling locations during the ESIA works. This population is taken to represent 0.4% - 0.6% the population within the EAAA. The EAAA therefore supports c. 0.5% of the global population and more than 5 reproductive units of this CR species. The additional flora surveys (Before Construction Biodiversity Baseline Report)

[6] Based on ERMs assessment as part of the ESIA, the West Istanbul Grasslands IPA is considered to be in a degraded state currently, with rather arbitrary mapping of the IPA boundary that includes areas and habitats that are now considered to be highly modified any many entirely lost/transformed due to existing development/land use change and no longer comprising suitable grassland habitats for supporting flora species responsible for the IPA designation.

[7] Only a very small section of the Project in the eastern section actually overlaps the IPA (and this is located in an area that has already been extensively developed/transformed with only fragments of remaining degraded and heavily modified habitats that are classified as 'transitional weeds' habitat in the ESIA). As such, actual impacts of the Project on the IPA (and flora species of importance) will probably be negligible and possibly only related to the loss of heavily modified habitat could be restored to a better condition (i.e. habitat that is currently not suitable for grassland flora of conservation important but that could possibly be restored to a more suitable state to support these species). Quantifying residual impacts to inform compensation requirements for meeting NG for the IPA doesn't make much practical sense given that the habitats in the Project area are not the native grassland types referenced for the IPA for supporting important plant species.

[8] Establishing habitats of a suitable type to support the long-term survival of self-sustaining threatened/rare grassland plant species for the IPA is likely to be a significant challenge given the lack of suitable areas in the IPA (given the extent of loss of habitats due to existing/legacy land use change impacts external to the Project) and ongoing pressures from development, grazing and other human activities.

indicate that the populations of the species identified at different locations support the presence of more than five reproductive units with the EAAA.

All the individuals of the species located within the footprint of the project will be lost during the vegetation clearance process in the construction phase, and the supporting habitat in those areas will be lost.

The habitat area supporting this species to be impacted is estimated to be 85.12 ha (Maquis - 0.11 ha, *Spartium junceum* fields -7.01 ha-, Black Sea garrigues -76.46 ha- and Coniferous plantations – 1.54 ha).

In application of the mitigation hierarchy, in order to obtain non-residual impact, on-site restoration of at least a similar area of lost *Cirsium polycephalum* habitat is proposed.

5.3.4 Loss of habitat supporting the species *Galanthus x valentinei*

The Project is expected to directly affect habitat supporting the PBF species Galanthus x valentinei. Galanthus x valentinei was originally recorded along the connecting road to the southwest of the route, which was subsequently removed following a design change, in Mediterranean riparian woodland (50 individuals were observed). As such habitat is known to be present in the Project's Area of Influence (AoI), it is considered that the species may also be present in additional suitable habitats.

The additional flora surveys indicate that the EAAA has been expanded to include Spartium junceum fields, where populations of identified species, with 250–300 individuals at a single sampling point, confirm the presence of the species within the AoI. In 2025, further field observations conducted by the EPC Biodiversity Expert also confirmed the presence of Galanthus x valentinei within Spartium junceum fields, with an estimated population of approximately 250–300 individuals, indicating a wider distribution than previously recorded during the ESIA phase.

The species is found only in the Thrace region in Türkiye. Its population is estimated to be 25,000 individuals. Based on its habitat preferences, Mediterranean riparian woodland within the Area of Influence was considered the EAAA for this species. The total extent of occurrence is less than 20,000 km². This is below the 50,000 km² threshold used to define range restricted species. Conservatively, the EAAA was then considered to support this regularly occurring range restricted species.

All the individuals of the species located within the footprint of the project will be lost during the vegetation clearance process in the construction phase, and the supporting habitat in those areas will be lost. The habitat area supporting this species to be impacted is estimated to be 5.21 ha (Mediterranean riparian woodland) and 7.01 ha (Spartium junceum fields).

In application of the mitigation hierarchy, translocation of Galanthus x valentinei has been implemented for individuals located within the Project footprint. Approximately 150 individuals were successfully translocated within the Project area as an impact avoidance and mitigation measure prior to construction. Monitoring of the translocated population will continue throughout the construction and operational phases to assess establishment success and long-term viability.

5.3.5 Calculation of Habitat Liability

In order to calculate the residual Critical Habitat and PBF habitat liabilities, a biodiversity metric has been used, based on the Habitat Hectares approach (Appendix A). The calculation takes into account the quality of the habitat lost to identify the minimum quantum of quality hectares (assuming a target condition of one being good condition) required to achieve no net loss for PBF qualifying habitat features and net gain for Critical Habitat (i.e. *Cirsium polycephalum*). From this analysis, the required range of areas of Maquis, *Spartium junceum* fields, Black Sea garrigues and Coniferous plantations to achieve a no-net-loss of biodiversity values for these habitat types are: 0.15 ha, 1.51 ha, 104.36 ha, and 0.414 ha respectively.

Table 8 Habitat Hectares/Offset Area Required

Habitat Type	Habitat Loss	Quality ha metric applied	Area of habitat x Quality	Justification of habitat quality	Difficulty of restoration*	Justification of restoration difficulty	Years to Target condition**	Justification	Overcompensation required to mitigate restoration/ creation risk***	Ratio
Maquis	0.11	0.75	0.08	The habitat is a successional phase with a relative degree of disturbance but hosts significant numbers of the trigger species	0.33	Native species that grow naturally and constitute a successional phase of local forests, and therefore adapted to grow in disturbed areas	0.49	Restoration of such habitat requires some years to attain similar quality levels	0.15	1.82
Spartium junceum fields	7.01	0.15	1.05	Fast-growing shrub, widely introduced as an ornamental and also for erosion control. It becomes an aggressive invader that forms dense, monospecific thickets and can displace native flora.	0.1	Fast growing habitat that adapts easily to disturbed areas.	0.343	It is a fast-growing habitat	1.51	1.443
Black Sea Garrigues	76.46	0.75	57.34	The habitat is a successional phase with a relative degree of disturbance but hosts significant numbers of the trigger species	0.33	Native species that grow naturally and constitute a successional phase of local forests, and therefore adapted to grow in disturbed areas	0.49	Restoration of such habitat requires some years to attain similar quality levels	104,36	1.82

Habitat Type	Habitat Loss	Quality ha metric applied	Area of habitat x Quality	Justification of habitat quality	Difficulty of restoration*	Justification of restoration difficulty	Years to Target condition**	Justification	Overcompensation required to mitigate restoration/ creation risk***	Ratio
Coniferous Plantations	1.54	0.15	0.23	It is a modified habitat (artificial plantation) that hosts relatively low number of individuals of the species *Cirsium polycephalum*	0.1	Coniferous plantations are widely used given their facility to colonize areas in restoration.	0.7	10 years at least to have sufficiently grown trees	0.414	1.8

Note:
* Difficulty of restoration (Easy 0.1, 0.33 , 0.67,1 hard))
** Years to Target condition (1=0.343, 5=0.490, 10=0.700, 20=0.837, 30=0.965)
*** Sum of the values of difficulty of restoration and years to target condition.

It must be noted that within the expropriation corridor, and not subject to direct intervention of the project, there are 89.72 ha of the modified habitat intense unmixed crops, that once expropriated could be used to reintroduce the affected natural habitats that support the critical habitat trigger species *Cirsium polycephalum.* In addition, once the construction has finished, there will be a surface of 156.31 ha formed by newly created embankments, that could be used to host the required offset site. The combination of both areas guarantees the sufficient surface to address the identified requirements within the boundaries of the project, constituting in this way, a restoration to ensure no net loss.

6. BAP IMPLEMENTATION

The in-situ impact control measures for avoidance, minimisation and remediation as three first steps of mitigation hierarchy are illustrated in this section. The Biodiversity Management Plan included in the ESIA applies to activities during both construction and operation of the Nakkas-Basaksehir Highway within the Project Area.

6.1 Roles and Responsibilities

The ultimate responsibility for implementing the BAP rests with Nakkaş Otoyol A.Ş, however specific technical tasks and measures will be delegated to the EPC Contractor and subcontractors/independent specialists likely to be involved in BAP implementation and monitoring.

To ensure action ownership, each measure has been assigned to a particular designation within Nakkas-Basaksehir Highway Project relevant parties. A list of responsible persons during the construction and operation phase is provided in Figure 7. Environmental and Social Compliance Manager and Biodiversity Staff will be responsible for BAP implementation and ensuring that the practices are successfully carried out. Additionally, the Biodiversity Expert will ensure that implemented measures are aligned with the BAP and have support from Environmental Staff, Health and Safety Site Supervisor and other staff.

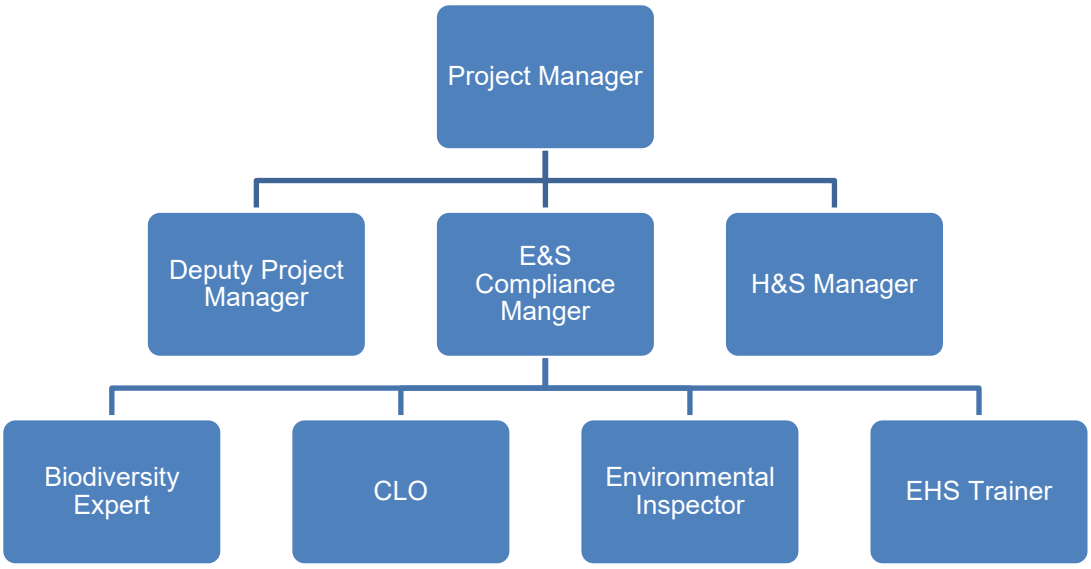


Figure 8 Organizational Chart of Construction Phase

6.2 BAP Review

This BAP is to be considered a 'living document' that will be updated and reviewed prior to commencement of construction, and also every six months thereafter during the construction phase of the Project or as soon as appreciable changes to the context or activities are identified.

6.3 Biodiversity Implementation Strategy

The objective of the Biodiversity Implementation Strategy is to set out how the Project can aim to achieve NNL to all biodiversity features, by means of applying the mitigation hierarchy, and if possible aim at obtaining NG to CH features, even when those are not subject to significant residual impacts, by means of an offset approach to compensating for residual impacts to biodiversity.

A range of options to deliver the required NNL and NG to biodiversity by application of the mitigation hierarchy for the Project have been considered. The options have been identified based on initial stakeholder consultation, discussions with relevant experts (Istanbul Botanical Gardens) and research undertaken by ERM. Further assessment is recommended to understand the strengths and weaknesses of each offset mitigation option, and for other potential ACAs related to the improvement of protection and management of the West Istanbul Grasslands IPA / Küçükçekmece Basin IBA and KBA.

These actions may take the following forms:

- Compensate for permanent loss of rare/endemic plants of conservation importance (PBF and CH features) through plant translocation and/or propagation and replanting;
- Enhance and manage the available habitat; and
- Establish (restore and recreate) and enhance habitat quality for the management period.

Table 9 provides an overview of the biodiversity actions that may be available to the Project.

Table 9 Overview of Biodiversity Implementation Options

S/N	Mitigation Hierarchy	Biodiversity alternatives	Action	Description	Next Steps	Difficulties / Challenges	Strengths / Opportunities
Ecological loss of threatened and/or endemic plant species							
1	Habitat Restoration	Translocation of plant species of conservation importance from the RoW	Translocation of *Cirsium polycephalum* and *Galanthus x valentinei* from the road RoW which would be lost	Field-based propagation and translocation measures for *Cirsium polycephalum* and *Galanthus x valentinei* have been completed, in alignment with the BAP objectives. For *Cirsium polycephalum*, targeted seed collection was conducted on 19 August 2022 during peak flowering and fruiting. Collected seeds were dried and stored under controlled conditions and subsequently transferred to the Türkiye Seed Gene Bank on 6 December 2023. On 16 February 2024, seeds of *Cirsium polycephalum* was planted into selected receptor habitats, located within lesser-degraded garrigue areas outside of the construction footprint. Planting was carried out at a depth of 2–3 cm. The area was fenced with iron railings to ensure protection, and weather conditions were favorable for germination. Regarding *Galanthus x valentinei*, bulb collection was performed on 20 January 2023 in Arnavutköy/Istanbul, focusing on a small population (fewer than 50 individuals). Approximately 30 viable bulbs were selected for translocation to a suitable riparian woodland site near Sazlıdere Dam. Subsequently, within the framework of updated mitigation actions, approximately 150 individuals located within the Project footprint were translocated within the Project area to avoid construction impacts. In addition, field surveys conducted in 2025 confirmed the presence of additional populations within *Spartium junceum* fields, with an estimated 250–300 individuals recorded at a single sampling point, indicating a wider distribution of the species within the Area of Influence. Monitoring of all translocated populations will continue throughout the construction and operational phases to evaluate establishment success and long-term viability.	▪ Ensure continued implementation and periodic revision of endemic/rare plant species translocation, seed/bulb collection, propagation, and planting guidelines in line with Section 7.8 of the CESMP, incorporating lessons learned from completed activities. ▪ Continue monitoring the condition of *Cirsium polycephalu*m and *Galanthus x valentinei* individuals at translocation sites to assess survival, flowering rates, and habitat suitability. ▪ Evaluate the effectiveness of the current receptor areas (e.g. lesser-degraded garrigue zones and riparian woodland near Sazlıdere Dam) and update management actions as needed. ▪ Conduct supplementary seed/bulb collection if natural populations show resilience and flowering success in subsequent seasons. ▪ Maintain protective infrastructure (e.g. fencing, cage systems) around translocation zones to prevent anthropogenic pressure, including grazing and unauthorized access. ▪ Document and report on propagation and survival success rates to inform adaptive management and potential replication in future projects.	▪ Cannot be accomplished in areas already stripped. ▪ Costs may increase with the need for longer-term monitoring, fencing, and potential replanting. ▪ Continuous monitoring, habitat management, and protection from anthropogenic disturbance remain necessary to ensure long-term success.	▪ In situ. ▪ Enhance Critical Habitat.
Loss of habitat supporting *Cirsium polycephalum*							

S/N	Mitigation Hierarchy	Biodiversity alternatives	Action	Description	Next Steps	Difficulties / Challenges	Strengths / Opportunities
2	Habitat Restoration	Habitat recreation	Restoration / Recreation of habitats supporting *Cirsium polycephalum* (Maquis, Black Sea Garrigues)	The areas occupied by modified habitats present within the expropriation corridor and not directly affected by the project (road reserve, interchange sites) and newly created embankments, will be used to recreate the mentioned affected habitats to enhance continuity and provide the necessary habitat in support of *Cirsium polycephalum*.	▪ Initial guidance on habitat reinstatement (rehabilitation of temporary work areas) is included in Section 7.25.1 of the CESMP. ▪ Prepare a sufficiently detailed 'Habitat Restoration and Recreation Plan' to identify areas for habitat creation/restoration and approach and methods with roles and responsibilities indicated. *Initial guidance on preparing such a plan is considered in Section 7.25.2 of the CESMP).* ▪ Identification of a service provider to support the Project team and the NGO in the seed collection process. ▪ To adequate the selected locations for the direct plantation of the different species forming the habitats or to receive translocated plants (either from RoW or from nursery). ▪ Monitor growth and development and secure watering to maximize success rate.	▪ Habitat recreation is generally considered difficult to achieve in this semi-arid environment. ▪ Long-term maintenance. ▪ The measure will require continuous monitoring and maintenance for the life of the project. ▪ High cost.	▪ In situ taking advantage of expropriation corridor. ▪ Restoration of generated embankments and protection against erosion. ▪ Enhance Critical Habitat.
Loss of habitat supporting PBF qualifying features (habitats + flora/fauna species)							
3	Habitat Restoration	Habitat recreation	Restoration / Recreation of PBF qualifying habitats: e.g. Maquis, Black Sea Garrigue, Hay-meadows	The areas occupied by modified habitats present within the expropriation corridor and not directly affected by the project (road reserve, interchange sites) and newly created embankments, will be used to recreate the mentioned affected PBF qualifying habitats, to enhance continuity and provide the necessary habitat in support of PBF qualifying species of flora and fauna. Fill embankments and the road corridor/reserve including services area will be reinstated to a form of indigenous grassland and/or mixed low shrubland (resembling Garrigue / Maquis) type habitat rather than monotypic grass or conifers. Where additional sites outside of the expropriation areas for the highway are needed to meet restoration targets for habitat, these offsite compensation areas will need to be identified and secured and integrated into the habitat restoration plan. In ERMs opinion, NNL of biodiversity for the Küçükçekmece Basin IBA/KBA and relevant waterbird species and habitats could be delivered through a series of actions aimed at avoiding/minimizing impacts, restoring habitats for key species and then considering compensation where residual impacts still remain to key PBF waterbird species that utilize the aquatic habitats in the IBA/KBA. Such a phased approach is well-aligned with the mitigation hierarchy and is described under the 'Next Steps' in the column to the right.	▪ As above under S/N 2 ▪ Identify where possible key local wildlife corridors suitable for potential terrestrial species movement between habitats that may be obstructed or severed by the road development (this is included in the CESMP). ▪ Design and implement appropriate wildlife crossings as part of the road design, in order to maintain connectivity between habitats and key local corridors for terrestrial fauna (focus will be on accommodating threatened species and PBFs, including small mammals, reptiles and amphibians in particular (this is included in the CESMP). ▪ It is recommended that the implementation of key avoidance/minimization mitigation measures aimed at waterbird species, as contained in the CESMP, be reviewed in light of the Project's current status and through relevant auditing/monitoring already conducted, to determine the degree to which these have been implemented and what further residual impacts to waterbird species and habitats in the Küçükçekmece Basin IBA/KBA may require further management actions, and potentially how these can be addressed towards meeting at least a NNL objective (see additional actions below). ▪ Investigate opportunities to restore/conserve/protect remaining habitats used by waterbirds within the Küçükçekmece Basin as part of review and update to the existing Habitat Restoration Plan (HRP) for the Project - As part of the planned review and updates to the existing HRP, investigate opportunities to	▪ As above under S/N 2 ▪ Key will be for the HRP update to consider constraints and limitations to what can be achieved in practice and to prioritize areas where conservation outcomes will be most relevant to the IBA/KBA and most easily achievable and which can be secured in the long-term as gains for biodiversity in the basin. ▪ Actions associated with updating the management plan for the Küçükçekmece Basin IBA/KBA will ultimately be dependent however on the reception and commitment from BirdLife/ Doğa to work together with the Project/developer.	▪ As above under S/N 2. ▪ The areas under plantation forestry and/or crop cultivation adjacent to the Sazlidere Dam (west side) used for habitat recreation will enhance the improved management of water quality at the dam and to provide a fringing habitat suitable for key species. ▪ Good opportunity to link waterbird species and aquatic habitat conservation associated with the Küçükçekmece Basin IBA/KBA with the habitat restoration/compensation planned as per the HRP update.

S/N	Mitigation Hierarchy	Biodiversity alternatives	Action	Description	Next Steps	Difficulties / Challenges	Strengths / Opportunities
					secure/restore/conserve remaining aquatic/semi-aquatic habitats surround the open water reservoirs in the Küçükçekmece Basin. - In addition, or alternatively, consider also opportunities to improve the quality of these habitats or avert further loss of habitat extent/quality/function by alleviating pressures from surrounding land uses through source-directed controls and other conservation measures. Nature-based Solutions (NbS) could for example for explored as part of the HRP update, where possibilities to enhance ecosystem services and functionalities would be considered further (such as those linked with sediment/nutrient/pollutant trapping ability of vegetation buffer strips around reservoirs, or even creating artificial wetlands at key points to enhance water quality through sediment/nutrient trapping and assimilation). - This would firstly require a firmer understanding of existing/future threats and constraints, such as those associated with urban and industrial (water) pollution, etc., which will be achieved through desktop mapping and literature review at a minimum during the HRP update (with potentially a field verification exercise required for key sites that could benefit from protection/restoration). - As part of this review (above step), existing conservation actions in the catchment (e.g. pollution/waste prevention, etc.) should also be identified and the possibility for the Project to contribute to these explored (taking into account compensation/offset principles around 'additionality', etc.). - Depending on timeframes, there may also be an opportunity to link the HRP update more explicitly with the management plan for the IBA/KBA (existing one, if available, or updated when available – see action below). However, at this stage the feasibility of this action remains largely uncertain and ERM recommends that this action should be revisited in future during reviews/updates to the BAP. ▪ Following updates to the HRP, the specific actions contained in the HRP will be implemented. 'Habitat Restoration and Recreation Plan' to consider opportunities for the enhancement to reptile and amphibian habitats to benefit all stages of their life cycles (through habitat creation, corridor enhancement, rehabilitation of disturbed aquatic and semi-aquatic habitats for example). ▪ Pre-construction surveys and population counts for European Souslik and Marbled polecat to take place and where identified, enhancements to the existing habitats to be planned and implemented. - Look into options for the reduction in surrounding agricultural run-off into Sazlıdere Dam where possible or other habitat enhancement to support amphibians/fish ▪ BirdLife consider the existing management plan for the IBA/KBA to be out of date or not sufficiently comprehensive, according to the factsheet for the IBA/KBA. An additional conservation action would be		

S/N	Mitigation Hierarchy	Biodiversity alternatives	Action	Description	Next Steps	Difficulties / Challenges	Strengths / Opportunities
					to explore the opportunity for the Project to support the necessary review and update of the existing/outdated management plan for the IBA/KBA: - Updating the management plan could in practice be achieved through consultation with BirdLife International's local partner in Turkiye, Doğa Derneği. Initial engagements with Doğa will be required to assess whether this is something the Project could support, perhaps through co-funding for example, and to confirm the approach, timeframes and costs involved, etc. - Following initial engagements with BirdLife/Doğa the option and feasibility of this action would be confirmed and if feasible, additional actions, steps and timelines would be developed and included in future updates to the BAP for the Project.		
Degradation of West Istanbul Grasslands IPA							
4	Additional Conservation Action	Focused grassland habitat restoration, protection and flora species conservation in the IPA	Contribute to the reintroduction and conservation of important flora species that have already been lost from the IPA (due to external influences) through implementing a relevant plan and program.	Given the current degraded status of the West Istanbul Grasslands IPA, the likely negligible impact of the Project on habitats in the IPA and the fact that there are several limitations and constraints to what can be achieved practically in terms of delivering NG for the habitats that will be impacted within the IPA , in ERMs professional opinion a more pragmatic approach to defining CH and NG objectives and actions for the IPA is needed. The recommended approach is to contribute to the reintroduction and conservation of important flora species that have already been lost from the IPA (due to external influences) and this would be achieved through a set of phased actions, described under the 'Next Steps' in the column to the right.	Action 1: Develop and implement a program to propagate/conserve conservation-importance flora species important for the IPA: • The Project/developer, in collaboration with the Istanbul Botanical Gardens (IBG) (e.g. through a co-funding mechanism for example), is to develop and implement a program aimed at propagating and conserving plant species of conservation-importance that are designated for the West Istanbul Grasslands IPA (e.g. distinctive calcareous grassland flora including many nationally rare and endemic species) and eventually reintroducing these into the wild (see 'Action 2' below). • This would involve firstly identifying the particular flora species responsible for the IPA designation and their habitat/ecological requirements, and through consultation with the horticulturalists/botanists at the IBG, confirm which species are currently being propagated/conserved at the IBG already and which additional species could be targeted in future, recognizing potential local/regional constraints to species propagation, availability,	Local/regional constraints to flora species propagation, availability, potential to be reintroduced into the wild (experts at the BGI to be consulted in this matter). Specific plant species ecological requirements may not be able to be met, or particularly met as habitats may be suboptimal, and any constraints/limitations will need to be accounted for (experts at the BGI to be consulted in this matter).	As above under S/N 2. IPA is already heavily degraded, so any further conservation actions, no matter how large or small, are likely to be seen as a net positive/gain for flora species conservation and biodiversity in the area Good opportunity to link species conservation with habitat restoration/compensation planned as per the HRP update.

S/N	Mitigation Hierarchy	Biodiversity alternatives	Action	Description	Next Steps	Difficulties / Challenges	Strengths / Opportunities
					potential to be reintroduced into the wild (which the experts at the BGI should be aware of). • The mechanism for reintroducing species into the wild (i.e. using the restored/conserved habitat as part of the Project and Habitat Restoration Plan as receiving areas – see' Action 2' below) would need to also be considered, through support from the horticulturalists/botanists at the IBG (e.g. through planting of propagules/live seedlings, reseeding areas, etc., depending on the specific plant species requirements and any constraints/limitations accounted for). ▪ Action 2: Link the existing habitat restoration and compensation opportunities identified in the existing Habitat Restoration Plan (HRP) to options for rare/endangered flora species reintroduction and conservation: • This could be achieved by intentionally targeting the restoration/protection of calcareous/limestone grassland and rocky outcrops habitats where conservation-important plant species (see 'Action 1' above) can eventually be reintroduced. • This would start with revisiting the HRP and the habitat mapping undertaken for the ESIA and HRP, to identify which grassland habitats to be restored/recreated/conserved could be considered optimal or at least suitable as receiving areas for plant species reintroductions and making the link between flora species conservation and habitat restoration more explicit and intentional in the revised HRP, with a clear indication of which habitats and species for the IPA will be targeted towards achieving biodiversity NG. • The HRP is to be revised to include the specific actions for reintroducing and conserving important flora species for the selected grassland habitats targeted in the HRP and identified through the above sub-action. Targets and success criteria are to be developed at this stage as well. This could be included in the HRP (embedded) or as a sub-plan to the HRP. • Develop a specific plan and program (including schedule with timeframes and roles/responsibilities together with success indicators/targets, metrics and methods of monitoring and reporting) to monitor and manage/care for the habitats and any reintroduced flora species to ensure their long-term survival at an acceptable rate/target. The BGI or any other local/regional botanists/plant experts should also be consulted to support developing this plan/program. This plan/program could be included in the revised HRP.		

S/N	Mitigation Hierarchy	Biodiversity alternatives	Action	Description	Next Steps	Difficulties / Challenges	Strengths / Opportunities
					▪ Action 3: Implement the revised HRP (developed under 'Action 2') that takes into account flora species reintroduction/conservation: • Implement plant species reintroductions into the selected grassland habitats as per the revised HRP, under the guidance and remote/onsite support from horticulturalists/botanists the IBG (or other independent local/regional experts). This will need to be aligned carefully with other actions in the HRP (i.e. habitat restoration first to be implemented and measures to protect habitats in place before introducing flora species). • Implement the plan and program to monitor and manage/care for the habitats and any reintroduced flora species to ensure their long-term survival. This would require monitoring to inform whether targets and success criteria have or are being met, and to inform whether any adjustments to the HRP may be needed or adaptive management actions developed to ensure success.		

7. BIODIVERSITY MONITORING AND EVALUATION (BMEP)

The monitoring and evaluation is recommended throughout the Project's life cycle. However, it should continue until the end of the project's life cycle. Monitoring the measures overtime should be reviewed on an annual basis.

7.1 In-situ monitoring

Monitoring the success of in-situ restoration can be completed by an experienced organization that is engaged or collaborated during the activity (i.e. Istanbul Botanical Garden). The Project can request the monitoring report from the organization collaborating to measure the positive effect of the restoration program.

7.1.1 Biodiversity Evaluation Requirements

The following biodiversity evaluation requirements are to be applied in order to determine the monitoring and evaluation requirements associated with the habitats supporting the presence of *Cirsium polycephalum*, and West Istanbul Grasslands IPA status, as shown in Table 10.

Table 10 Interim Monitoring and Evaluation

S/N	Item	Indicators / Parameters	Monitoring / Inspection / Spot Check Parameters			
			Timing or Frequency of Monitoring	Parameters	Location	Reporting Requirements
1	Monitor success of translocation of plant species of conservation concern	30% success of translocated plants (per species)	Yearly	Success rate per species (number of plants alive / number of plants translocated)	Along the expropriation corridor (restored embankments and recreated habitats)	Annually monitoring report Report of adjusted mitigation measures, if any
2	Monitor success and conservation status of recreated habitats	Evaluate the status of the recreated habitats and existing diversity in each of them by comparing with nearby natural areas	Yearly	Area occupied by a health and evolving recreated habitat Diversity of flora and fauna species	Along the expropriation corridor (restored embankments and recreated habitats)	Annually monitoring report Report of adjusted mitigation measures, if any
3	Monitor natural habitat vegetation areas within West Istanbu Grassland IPAl	Evaluate the status of existing natural habitat areas that may harbour IPA trigger species	Yearly	Diversity	Pre-selected plot areas to the east of the Project footprint	Annually monitoring report Report of adjusted mitigation measures, if any

S/N	Item	Indicators / Parameters	Monitoring / Inspection / Spot Check Parameters			
			Timing or Frequency of Monitoring	Parameters	Location	Reporting Requirements
4	Pre-construction surveys and population counts for European Souslik and Marbled polecat	Surveys completed pre-construction	Once-off, pre-construction	Presence, abundance of species	Natural habitats associated with the road RoW	Once-off report with recommendations for further mitigation and monitoring

8. NEXT STEPS AND UPDATES

This section provides an overview of previously identified next steps and the current status of Project implementation as of February 2025s. These actions, along with their associated indicators, serve as a baseline for evaluating the progress and success pf BAP implementation to date. Furthermore, this approach provides a general understanding of the status of previously defined steps which could be established as a foundation for detailed monitoring efforts as the BAP evolves and updates are made.

At the time of this report update (Q1 2025), the Project has progressed so far on:

- The Cable-Stayed Bridge (ongoing),
- Bridge Approach Viaducts, V-02 Viaduct, V-03 Viaduct, V-05 Sular Valley Viaduct, V-04 Viaduct (ongoing),
- Wall structures (ongoing),
- Underpasses/overpasses (ongoing)

In the light of the current and planned progress of the construction activities, the BAP implementation strategy has been updated to reflect both the latest developments, findings of recent pre-construction flora/fauna surveys and the next steps required to achieve biodiversity NNL/NG objectives for the Project aligned with lender's standards. To enhance the tracking and evaluation of BAP actions and activities, Table 11 has been expanded to include additional columns for indicators and status. These additions will provide measurable benchmarks and clear overview of progress, ensuring effective monitoring and timely completion of actions.

Based on the current/expected progress of the Project construction activities, ERM suggests the following steps for BAP implementation in Table 11 below.

Table 11 Next Steps and Progress for the Implementation of the BAP

S/N	Action	Responsibility	Timeline[9]	Date Due	Success Indicator(s)	Action Details	Status (Feb. 2025)
Minimisation and Remediation							
1.	Implementation of procedures appended to the CESMP (including wildlife crossings design and implementation)	EHS Manager and Contractor	Immediately and throughout construction and operation	Pre-construction onwards	Wildlife crossings designed and implemented	Implemented wildlife crossings The updated Habitat Restoration and Recreation Plan (HRP) will explicitly incorporate expanded Key Biodiversity Area (KBA) actions and will be aligned with the Biodiversity Action Plan (BAP) requirements. The HRP will serve as the primary implementation mechanism for achieving No Net Loss (NNL) within both the KBA and IPA, ensuring that restoration, offset, and enhancement measures are fully integrated and measurable. The updated HRP will be revised to reflect the expanded scope of restoration areas and biodiversity features identified within the	Completed (Q1 2023)

[9] The reference to “pre-construction” in the timeline column denotes activities that were initiated prior to the commencement of construction in specific sections of the project. As construction is advancing in a phased and fragmented manner—particularly from chainage KM 45+000 onwards—it is not currently feasible to assign definitive dates to each action. Therefore, indicative terms have been applied to the timeline column to reflect the varying progress across different sections of the project corridor.

S/N	Action	Responsibility	Timeline[9]	Date Due	Success Indicator(s)	Action Details	Status (Feb. 2025)
						Project Area of Influence.	
Restoration							
1.	Prepare a sufficiently detailed 'Habitat Restoration and Recreation Plan'	The Project to engage a qualified consultant/ecologist	Pre-construction (The document was prepared before starting construction.)	Pre-construction	Habitat Restoration and Recreation Plan prepared	Pre-liminary restoration plan prepared for habitat, requires detail	Ongoing (until Q1-Q2 2026, expected)
2.	Undertake pre-construction surveys and population counts for European Souslik and Marbled polecat to inform enhancements to the existing habitats to be planned and implemented	The Project to engage a qualified consultant/ecologist	Pre-construction and during construction	Pre-construction	Pre-construction surveys undertaken	Surveys undertaken in 2023 and 2024, still being implemented in a phases manner for 2025	Ongoing (until Q4 2025, expected)
3.	Prepare plant translocation / seed collection and propagation/planting guidance and methods	The Project to engage a qualified consultant/ecologist / botanist	Pre-construction (expected Q2 2025)	Pre-construction	Guidance and method on protected plant translocation / replacement	In preparation	Ongoing (until Q2 2025, expected)
4.	Localize threatened flora species individuals to be translocated, if relevant	The Project to engage a qualified consultant/ecologist	Pre-construction (Q1 2024)	Pre-construction	Threated flora have been translocated	Successful translocation of threatened flora species	Completed (Q1 2024)
5.	Identify a service provider to help with the seeds collection, translocation of specimens (if relevant) and the recreation of habitats	E&S Compliance Manager and Contractor to engage Istanbul Botanical gardens	Pre-construction (6 months prior to construction completion)	Pre-construction	Service provider for seed collection/plant translocation identified and contracted	Under consideration still	Partially completed [10] (until six months before construction ends)

[10] Seed collection activities were completed in certain areas during Q1 2025, while implementation in the other areas is still in progress as part of a phased approach. Within the scope of the "Habitat Restoration and Recreation Plan", areas requiring restoration will be identified based on the results of ecological monitoring. Subsequently, a qualified service provider will be appointed to carry out the restoration and recreation works.

S/N	Action	Responsibility	Timeline[9]	Date Due	Success Indicator(s)	Action Details	Status (Feb. 2025)
6.	Select the preferred areas to translocate plants (if relevant) and recreate the habitats	E&S Compliance Manager and Contractor	Pre-construction (6 months prior to construction completion)	Pre-construction	Translocated plant receiving areas identified	Under consideration still	Ongoing (until six months before construction ends)
7.	Collect specimens for translocation and store adequately for translocation	E&S Compliance Manager and Contractor	Construction	Construction onwards	Specimens / seed of threatened plant species collected and stored	Seeds stored in Turkish Seed Gene Bank for *Cirsium polycephalum*, *Ferulago confuse*, *Gypsophila glomerata* Bulbs collected for *Galanthus x valentinei*	Partially completed [10] (Q3 2025)
8.	Recreate habitats and include translocated specimens in areas outside the RoW	E&S Compliance Manager and Contractor	Construction and pos-construction	Construction onwards	Habitat restoration implemented at selected sites	*Cirsium polycephalum*, *Ferulago confuse*, *Gypsophila glomerata* were planted in suitable habitats. *Galanthus x valentinei*: bulbs were planted near Sazlıdere Dam. This action will be implemented in close linkage with the updated HRP and expanded KBA-related biodiversity commitments. The HRP will define priority restoration areas and ensure that habitat recreation and translocation measures contribute directly to No Net Loss (NNL) and,	Ongoing (post-construction phase)

S/N	Action	Responsibility	Timeline[9]	Date Due	Success Indicator(s)	Action Details	Status (Feb. 2025)
						where feasible, Net Gain objectives within the KBA and IPA. The integration of KBA-level actions into the HRP represents an increased level of commitment to biodiversity outcomes and strengthens the long-term ecological restoration strategy of the Project.	
9.	Recreate habitats along embankments	E&S Compliance Manager and Contractor	Operation	Operation onwards	Habitat recreated along embankments	Needs to be initiated	Not started
10.	Continuously monitor the on- site species and habitat as well as success/ failure of offset and adjust actions if needed	The Project to engage a qualified consultant/ecologist	Identification of offset success/ failure: annually	Construction onwards	-Monitoring of habitat restoration / creation sites	Requires habitats first to be restored / recreated	Not Started
Additional Conservation Action							
8.	Contribute to the reintroduction and conservation of important flora species that have already been lost from the IPA (due to external influences) through implementing a relevant plan and program.	E&S Compliance Manager and Contractor to engage Istanbul Botanical gardens The Project to engage a qualified consultant/ecologist / botanist	To be considered as part of the HRP update (Q1-Q2 2026 potentially)	Operation onwards		Needs to be initiated	Not Started

APPENDIX A HABITAT LIABILITY APPROACH

1. Biodiversity Offset Metric

One method to account for the critical habitat losses, and therefore calculate the liability of the Project to deliver net gain, is to use biodiversity metrics. Metrics allow both the biodiversity loss and the proposed mitigation to be quantified to support a mitigation strategy's purpose to deliver biodiversity net gain for the critical habitat features.

It is further supported by a recent study by Gamarra *et al*. (2018) that evaluated established biodiversity metrics and scored the Habitat Hectares relatively highly. Given that the offset target are habitats and that there are large amounts of data collected by the Project on the critical habitat, the Habitat Hectares would also be concluded as a suitable option utilising the decision tree.

2. Habitat Hectares

The Habitat Hectares enables us to identify the amount of habitat of the same ecological vegetation class type that would be required to replace the habitat lost to the project. However, most metrics recognise that replacement of habitat is subject to a number of risks and that a simple 1:1 ratio may not be suitable to achieve effective compensation for habitat loss such as Guidance on the Habitats Directive 92/43/EEC, in relation to compensation ratios states (European Commission January 2007). Areas of habitat types within the project area have been determined based on habitat condition scores. These scores are used to set a baseline condition of the impact site against a habitat condition benchmark (set at a value of 1). The Habitat Hectare model relies on scores to define 'vegetation quality', being the degree to which the current vegetation differs from a 'benchmark' representing characteristics of a mature and apparently long-undisturbed stand of the same vegetation community. Essentially, this method attempts to assess how 'natural' a site is by comparing it to the same vegetation type in the absence of major ecosystem changes that have occurred (Parkes et al 2003).

Outlines the habitat class condition scores applied (Table A1). These scores have been derived based on the definitions contained in IFC PS6 for "natural" and "modified" habitats and the definition of "degradation" of habitats (IFC, 2012). The scores have been derived to reflect the relative difference between a condition category and the benchmark, which in effect is a proxy for the 'restorability' of that habitat.

Table A1. Habitat condition scores (A)

Condition	Definition	Value
Benchmark	Benchmark habitats in a mature condition with only native origin vegetation, a diversity of species of a mature or senescent state; and no sign of human disturbance (such as the presence of waste, vegetation removal).	>0.75-1
Natural	Natural condition is defined as habitat largely of native origin, and/or where human activity has not essentially modified the primary ecological functions and species composition. Some disturbance is likely present such as vegetation removal, waste and minor introduction of invasive species.	>0.5- 0.75
Modified	Modified condition habitats are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition	>0.25-0.5
Degraded	Degraded condition is defined as significant conversion or degradation of the habitat such as the elimination or severe diminution of the integrity of a habitat caused by a major and/or long-term change in land or water use; or (ii) a modification that substantially minimizes the habitat's ability to maintain viable populations of its native species	0-0.25

The management of candidate offset sites enables biodiversity value “gains” and hence enables impacts to be offset (that is, compensate for losses). This is calculated based on the expected outcomes from positive interventions from management actions at the offset site to improve biodiversity values.

The gains in condition value are relative to the existing condition of the offset site. Sites with an existing benchmark/natural condition are likely to have an incrementally smaller improvement in biodiversity condition values through management over time. Sites with a lower baseline condition have a greater capacity to improve as a result of conservation management over time.

3. Offset Gain Period

The time period chosen for management of the offset areas has been 20 years, which is the same timeframe as the concession agreement. This period has been chosen based on the response to management and restoration activities. A shorter period of management would increase the area required to be offset.

APPENDIX B UPDATED HABITAT MAPPING

ERM has over 160 offices across the following countries and territories worldwide

Argentina
Australia
Belgium
Brazil
Canada
Chile
China
Colombia
France
Germany
Hong Kong
India
Indonesia
Ireland
Italy
Japan
Kazakhstan
Kenya
Malaysia
Mexico
Mozambique
Myanmar
The Netherlands
New Zealand
Norway
Panama
Peru
Poland
Portugal
Puerto Rico
Romania
Singapore
South Africa
South Korea
Spain
Sweden
Switzerland
Taiwan
Thailand
UAE
UK
US
Vietnam

ERM GmbH

Brüsseler Str. 1-3
60327
Frankfurt am Main
Germany

T:+49 6102 206 0
F: +49 6102 771 904 0

www.erm.com

The business of sustainability

ERM