
MERSİN-ADANA-GAZİANTEP HIGH STANDARD RAILWAY PROJECT

CRITICAL HABITAT ASSESSMENT

NOVEMBER 2021

ANKARA

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1 SCOPE

This report includes Critical Habitat Assessment (CHA) for Mersin-Adana-Gaziantep High Standard Train Project, that has been undertaken in line with IFC Performance Standard (PS) 6 and corresponding Guidance Note (GN) to identify areas which are considered as critical habitats.

This report aims to: identify Critical Habitat-qualifying biodiversity associated with the Project; Natural and Modified Habitat mapping, including mapping Critical Habitat were possible; highlight the implications of the CHA results; and identify the recommended next steps for the Project, including identification of data gaps and the need for additional field surveys.

PS6 makes several stipulations for Critical Habitat, including achievement of a net gain for Critical Habitat-qualifying biodiversity. A net gain is required where significant residual adverse impacts are arising from project development. In Natural Habitat, no net loss, where possible, is required. A robust project-specific ESIA baseline is vital, followed by an iterative and thorough application of the mitigation hierarchy to ensure that impacts are avoided, minimized and restored as far as feasible, reducing the significance of any residual impacts and the requirement for offsetting.

2 APPROACH

In accordance with IFC PS6, habitats are divided into modified, natural and critical habitats. Critical habitats can be either modified or natural habitats supporting high biodiversity value, including:

- Habitat of significant importance to critically endangered and/or endangered species (International Union for Conservation of Nature and Natural Resources (IUCN) Red List)
- Habitat of significant importance to endemic and/or restricted-range species
- Habitat supporting globally significant concentrations of migratory species and/or congregatory species
- Highly threatened and/or unique ecosystems
- Areas associated with key evolutionary processes

PS6 guides how to best identify three classes of area based on vegetation condition ('quality' or 'state'), and significance for biodiversity (Table 1). PS6 uses the term 'habitat' to refer to these areas, rather than the actual vegetation within them. These three area classes are (i) **Modified Habitat**; (ii) **Natural Habitat**; and (iii) **Critical Habitat** (with Critical Habitat a subset of Modified and Natural Habitat).

Habitat condition is classified as either Natural or Modified based on the extent of human modification of the ecosystem. Monoculture plantations, agricultural areas and urban areas are usually classed as Modified. Both Natural and Modified Habitats may contain globally important biodiversity values, thereby qualifying as Critical Habitat

Table 2-1. Habitat Classes

Areas Identified in PS6		Condition of the Area	
		Natural	Modified
High Biodiversity Values	Present	Critical Habitat	Critical Habitat
	Absent	Natural Habitat	Modified Habitat

Since habitat destruction is recognized as a major threat to the maintenance of biodiversity and to assess likely significance of impacts, IFC PS6 requires the following depending on habitat status:

Modified 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.

Modified habitats may include areas managed for agriculture, forest plantations, reclaimed coastal zones, and reclaimed wetlands.

Performance Standard 6 applies to those areas of modified habitat that include significant biodiversity value, as determined by the risks and impacts identification process required in Performance Standard 1. The client should minimize impacts on such biodiversity and implement mitigation measures as appropriate.

Natural habitats are areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition.

The client will not significantly convert or degrade natural habitats, unless all of the following are demonstrated:

- No other viable alternatives within the region exist for development of the project on modified habitat;
- Consultation has established the views of stakeholders, including Affected Communities, with respect to the extent of conversion and degradation; 8 and
- Any conversion or degradation is mitigated according to the mitigation hierarchy.

In areas of natural habitat, mitigation measures will be designed to achieve no net loss of biodiversity where feasible. Appropriate actions include:

- Avoiding impacts on biodiversity through the identification and protection of set-asides,
- Implementing measures to minimize habitat fragmentation, such as biological corridors;
- Restoring habitats during operations and/or after operations; and
- Implementing biodiversity offsets

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 congregatory species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes.

In areas of critical habitat, the client will not implement any project activities unless all of the following are demonstrated.

- No other viable alternatives within the region exist for development of the project on modified or natural habitats that are not critical;

- The project does not lead to measurable adverse impacts on those biodiversity values for which the critical habitat was designated, and on the ecological processes supporting those biodiversity values;
- The project does not lead to a net reduction in the global and/or national/regional population of any Critically Endangered or Endangered species over a reasonable period of time; and
- A robust, appropriately designed, and long-term biodiversity monitoring and evaluation program is integrated into the client's management program.

In such cases where a client is able to meet the requirements defined above, the project's mitigation strategy will be described in a Biodiversity Action Plan and will be designed to achieve net gains of those biodiversity values for which the critical habitat was designated.

2.1 Data Collection

A literature review was performed to understand the baseline conditions of the Project Area of Analyses (AoA) as well as informing the CHA. Primary sources of Project-related information such as draft ESIA report and other literature sources including reports, articles, etc. related to the site and on-line resources were used to support this study. Spatial analysis of data available through the Integrated Biodiversity Assessment Tool (IBAT Report generated on 27.10.2021) was compiled. National Red List information was also reviewed.

Protected areas and internationally recognized areas such as Key Biodiversity Areas (KBAs) and Important Bird Areas (IBAs) within the AoA was identified. Such areas require consideration as they provide an indicator of the likely presence of CH-qualifying biodiversity (IFC 2019, Guidance Note 54) and carry specific requirements under IFC PS6.

Baseline information on terrestrial ecology information has been collected through ecological surveys conducted within the scope of the Supplementary Lender Information Package (SLIP) study.

The dates of the field studies carried out are given below;

- 19-21 September 2020 (ESIA)
- 21-23 November 2020 (ESIA)
- 14-18 October 2021 (SLIP)

2.2 Identification of Area of Analysis

The investigation into the region's ecology was carried out to define an "Ecologically Appropriate Area of Analysis" (AoA), to determine the presence of features that may qualify for Critical Habitat. The AoA was identified at a scale larger than the project site or impact area itself, considering large-scale ecological processes. This approach ensures that all potential

risks within the project footprint and surrounding vicinity are taken into consideration.

The AoA was defined using a combination of water catchments, topographic information, and legally protected areas and/or internationally recognized areas of high biodiversity value information. Species with a very specific distribution and ecological requirements were taken into account in defining the AoA.

The Terrestrial AoA (37,195 km²) was defined using a combination of topographic information, and legally protected areas and/or internationally recognized areas of high biodiversity value information.

The map showing the defined AoA is given in Figure 2-1.

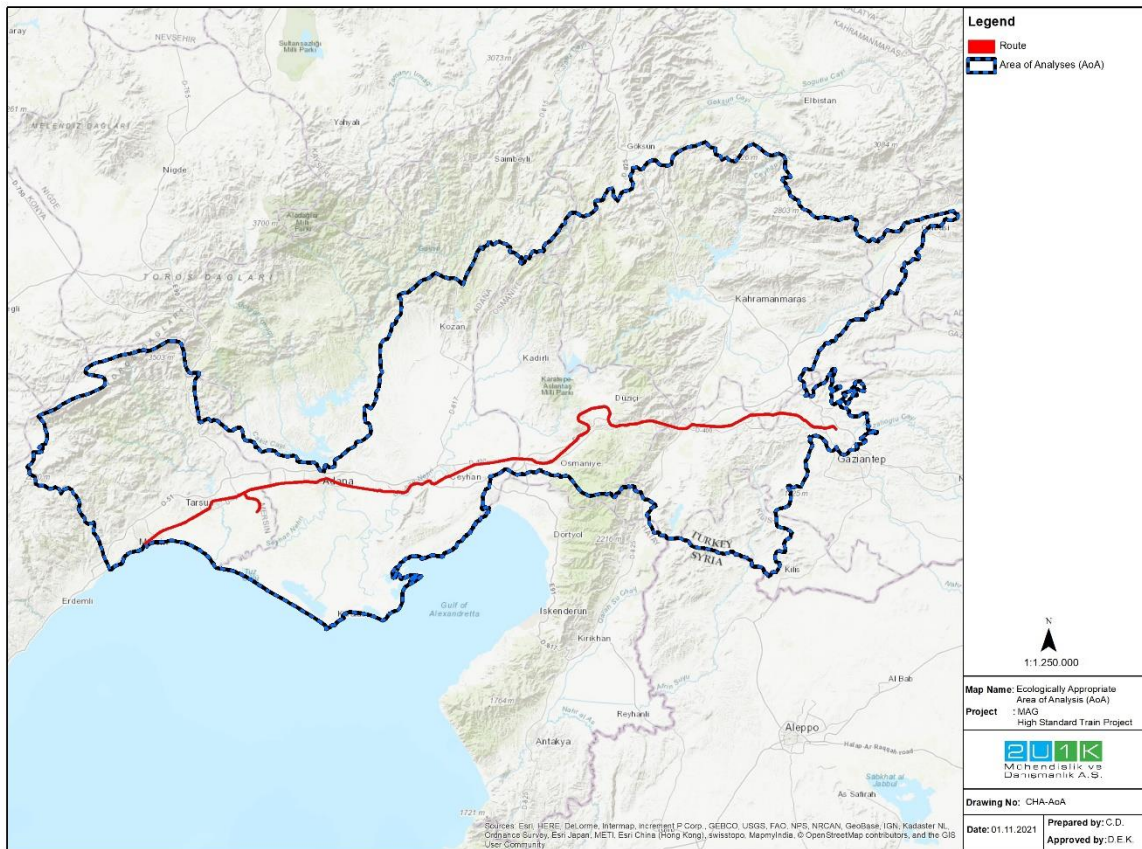


Figure 2-1. Terrestrial Area of Analyses

2.3 Critical Habitat Assessment Criteria

Critical habitats are areas of high biodiversity value that include at least one of the five values specified in IFC-PS6 and/or other recognized high biodiversity values. Each criterion has the same importance for making critical habitat designations or for determining compliance with PS6. Critical habitat. Criteria are as follows and should form the basis of any critical habitat assessment:

- Criterion 1: Critically Endangered (CR) and/or Endangered (EN) species
- Criterion 2: Endemic or restricted-range species
- Criterion 3: Migratory or congregatory species
- Criterion 4: Highly threatened and/or unique ecosystems
- Criterion 5: Key evolutionary processes

Projects that are located within internationally and/or nationally recognized areas of high biodiversity value may require a critical habitat assessment. Examples include the following:

- Areas that meet the criteria of the IUCN's Protected Area Categories Ia, Ib and II.
- Key Biodiversity Areas (KBAs), which encompass Important Bird and Biodiversity Areas (IBAs).

Consultation with the relevant national and international organizations that designate some areas is required. These areas should be identified during the assessment of critical habitat and brought to the attention of IFC as early as possible in the financing process. They include the following:

- UNESCO Natural and Mixed World Heritage Sites
- Sites that fit the designation criteria of the Alliance for Zero Extinction (AZE)

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

Species threatened with global extinction and listed as CR and EN on the IUCN *Red List of Threatened Species* shall be considered as part of Criterion 1. Critically Endangered species face an extremely high risk of extinction in the wild. Endangered species face a very high risk of extinction in the wild.

Thresholds for Criterion 1 are the following:

- (a) Areas that support globally important concentrations of an IUCN Red-listed EN or CR species ($\geq 0.5\%$ of the global population and ≥ 5 reproductive units of a CR or EN species).
- (b) Areas that support globally important concentrations of an IUCN Red-listed Vulnerable (VU) species, the loss of which would result in the change of the IUCN Red List status to EN or CR.
- (c) As appropriate, areas containing important concentrations of a nationally or regionally listed EN or CR species.

2.3.2 Criterion 2: Endemic and/or Restricted-Range Species

For purposes of Criterion 2, the term endemic is defined as restricted-range. Restricted range refers to a limited extent of occurrence (EOO¹).

- For terrestrial vertebrates and plants, restricted-range species are defined as those species that have an EOO less than 50,000 square kilometers (km²).
- For marine systems, restricted-range species are provisionally being considered those with an EOO of less than 100,000 km².
- For coastal, riverine, and other aquatic species in habitats that do not exceed 200 km width at any point (for example, rivers), restricted range is defined as having a global range of less than or equal to 500 km linear geographic span (i.e., the distance between occupied locations furthest apart).

The threshold for Criterion 2 is the following:

- a) Areas that regularly hold $\geq 10\%$ of the global population size and ≥ 10 reproductive units of a species.

2.3.3 Criterion 3: Migratory or Congregatory Species

Migratory species are defined as any species of which a significant proportion of its members cyclically and predictably move from one geographical area to another (including within the same ecosystem). Congregatory species are defined as species whose individuals gather in large groups on a cyclical or otherwise regular and/or predictable basis. Examples include the following:

- Species that form colonies.
- Species that form colonies for breeding purposes and/or where large numbers of individuals of a species gather at the same time for non-breeding purposes (for example, foraging and roosting).
- Species that utilize a bottleneck site where significant numbers of individuals of a species occur in a concentrated period of time (for example, for migration).
- Species with large but clumped distributions where a large number of individuals may be concentrated in a single or a few sites while the rest of the species is largely dispersed (for example, wildebeest distributions).

¹ **Extent of occurrence** [EOO] is defined as the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon, excluding cases of vagrancy (see below Figure 2 IUCN 2012). This measure may exclude discontinuities or disjunctions within the overall distributions of taxa

- Source populations where certain sites hold populations of species that make an inordinate contribution to recruitment of the species elsewhere (especially important for marine species).

Thresholds for Criterion 3 are the following:

- (a) Areas known to sustain, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population of a migratory or congregatory species at any point of the species' lifecycle.
- (b) Areas that predictably support ≥ 10 percent of the global population of a species during periods of environmental stress.

2.3.4 Criterion 4: Highly Threatened or Unique Ecosystems

The IUCN is developing a Red List of Ecosystems, following an approach similar to the Red List for Threatened Species. The client should use the Red List of Ecosystems where formal IUCN assessments have been performed. Where formal IUCN assessments have not been performed, the client may use assessments using systematic methods at the national/regional level, carried out by governmental bodies, recognized academic institutions and/or other relevant qualified organizations (including internationally recognized NGOs).

The thresholds for Criterion 4 are the following:

- a) Areas representing $\geq 5\%$ of the global extent of an ecosystem type meeting the criteria for IUCN status of CR or EN.
- b) Other areas not yet assessed by IUCN but determined to be of high priority for conservation by regional or national systematic conservation planning.

2.3.5 Criterion 5: Key Evolutionary Processes

The structural attributes of a region, such as its topography, geology, soil, temperature, and vegetation, and combinations of these variables, can influence the evolutionary processes that give rise to regional configurations of species and ecological properties. In some cases, spatial features that are unique or idiosyncratic of the landscape have been associated with genetically unique populations or subpopulations of plant and animal species. Physical or spatial features have been described as surrogates or spatial catalysts for evolutionary and ecological processes, and such features are often associated with species diversification. Maintaining these key evolutionary processes inherent in a landscape as well as the resulting species (or subpopulations of species) has become a major focus of biodiversity conservation in recent decades, particularly the conservation of genetic diversity. By conserving species diversity within a landscape, the processes that drive speciation, as well as the genetic diversity within species, ensures the evolutionary flexibility in a system, which is especially important in a rapidly changing climate.

For illustrative purposes, some potential examples of spatial features associated with evolutionary processes are as follows:

- Landscapes with high spatial heterogeneity are a driving force in speciation, as species are naturally selected based on their ability to adapt and diversify.
- Environmental gradients, also known as ecotones, produce transitional habitat, which has been associated with the process of speciation and high species and genetic diversity.
- Edaphic interfaces are specific juxtapositions of soil types (for example, serpentine outcrops, limestone, and gypsum deposits), which have led to the formation of unique plant communities characterized by both rarity and endemism.
- Connectivity between habitats (for example, biological corridors) ensures species migration and gene flow, which is especially important in fragmented habitats and for the conservation of metapopulations. This also includes biological corridors across altitudinal and climatic gradients and from “crest to coast.”
- Sites of demonstrated importance to climate change adaptation for either species or ecosystems are also included within this criterion.

The significance of structural attributes in a landscape that may influence evolutionary processes will be determined on a case-by-case basis, and the determination of critical habitat will be heavily reliant on scientific knowledge. In the majority of cases, this criterion will apply in areas that have been previously investigated and that are already known or suspected to be associated with unique evolutionary processes. While systematic methods to measure and prioritize evolutionary processes in a landscape do exist, they are typically beyond a reasonable expectation of assessments conducted by the private sector.

3 LIMITATIONS

Threatened and endemic flora species could not be observed as there was no vegetation period during the study period. Therefore, critical habitat assessment of flora species according to Criterion 1 and Criterion 2 will be carried out in the spring season.

Due to the out of migration period, migratory fauna species could not be observed during the field studies. Therefore, critical habitat assessment of migratory fauna species according to Criterion 3 will be carried out in the migration period.

This report should be re-evaluated in line with the findings of the study to be conducted in the spring.

4 IDENTIFICATION OF NATURAL HABITAT AND MODIFIED HABITAT

Existing project and publicly available information on land cover, and expert analysis was undertaken to designate land cover categories as Natural or Modified Habitat and determine the extent of each within the AoA. Available spatial land cover data, CORINE Land Cover (Copernicus 2018) was used to generate maps.

The results of a European University Information Systems (EUNIS) based habitat classification developed through analysis of GIS data are given in Figure 4-1. Close-up representation of the habitats along the route corridor is given in Appendix-A.

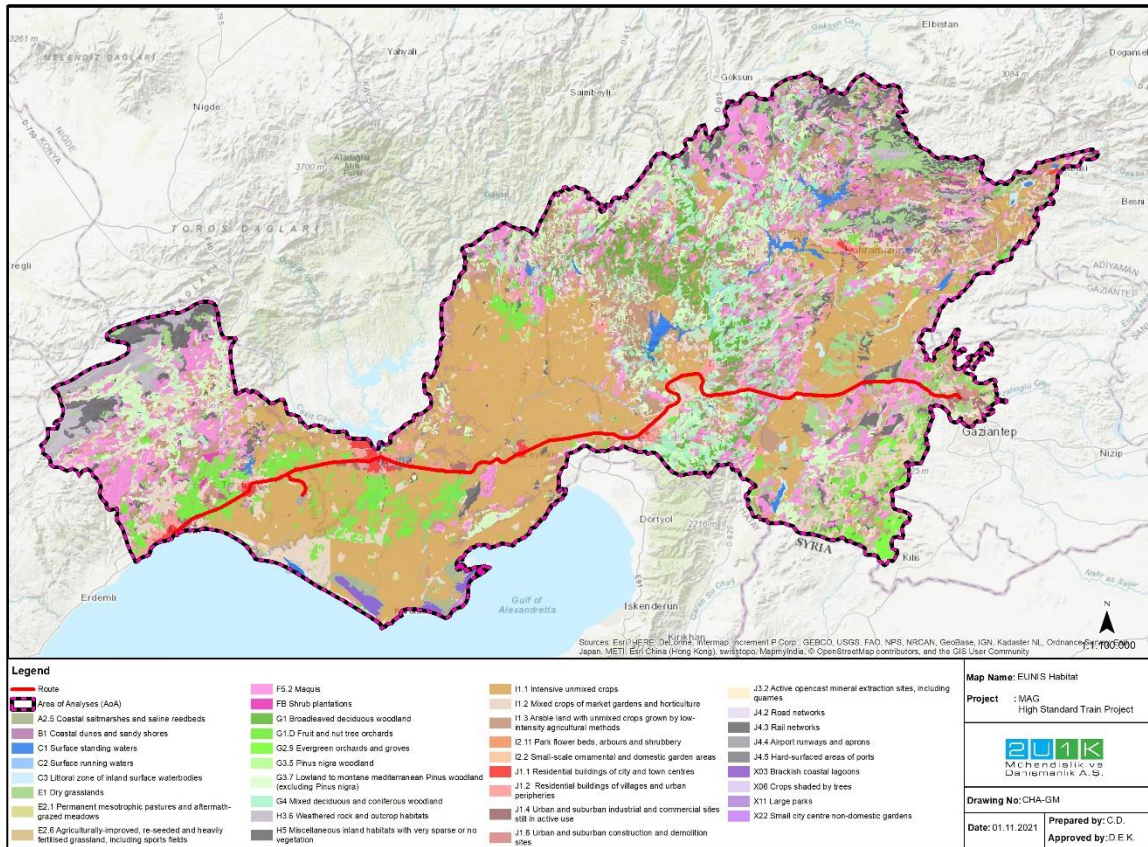


Figure 4-1. EUNIS Habitats

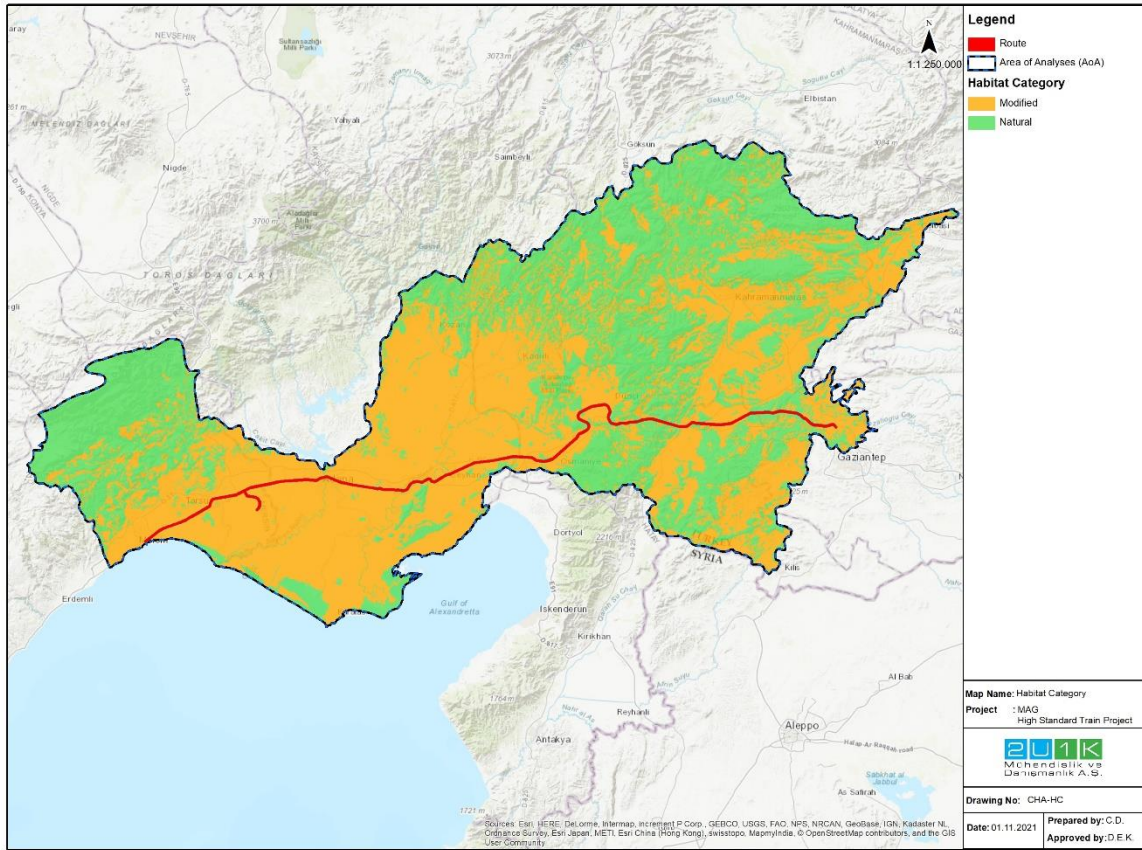


Figure 4-2. Natural and Modified Habitats

5 LEGALLY PROTECTED AREAS AND INTERNATIONALLY RECOGNIZED AREAS

“Legally Protected Areas” associated with the AoA are given in Figure 5-1.

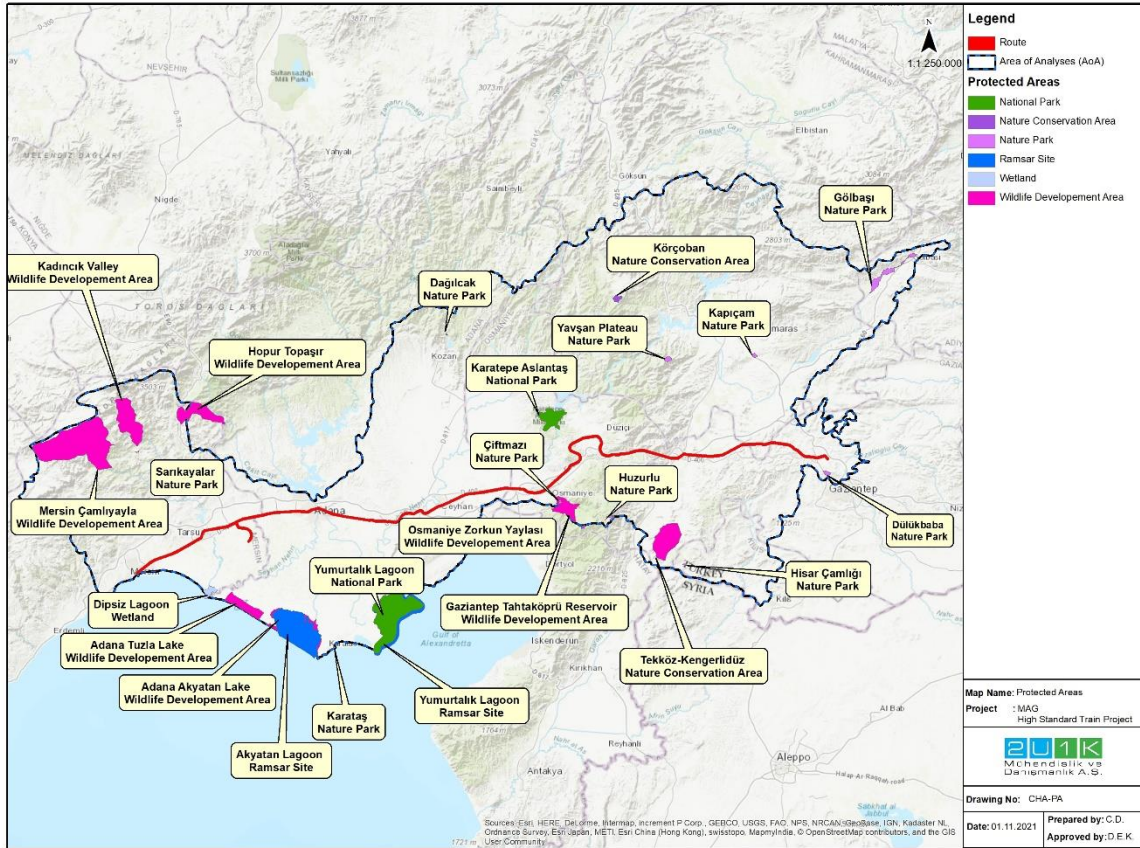


Figure 5-1. Legally Protected Areas

“Internationally Recognized Areas” associated with the AoA are given in Figure 5-2. Accordingly, the project route passes through Mersin Hills, Yılanlıkale Hills, Amanos Mountains and Yeşilce KBAs.

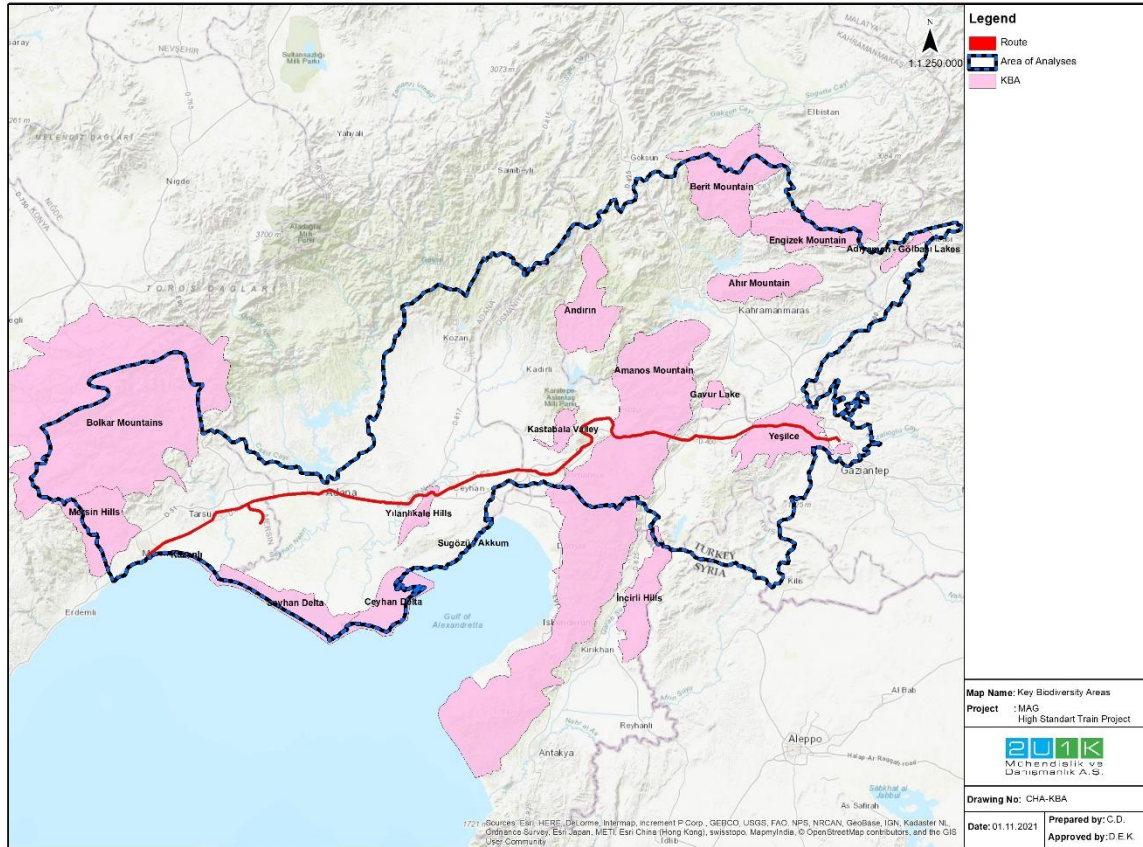


Figure 5-2. Internationally Recognized Areas

6 CRITICAL HABITAT ASSESSMENT

Evaluation against each criterion is carried out in table format which includes potential trigger species, their IUCN status, relation to the Project AoA, observation status in the AoA and summary of findings. Potential species were selected in line with the CHA Criteria from literature and survey findings.

Threatened and endemic flora species could not be observed as there was no vegetation period during the study period. Therefore, critical habitat assessment of flora species according to Criterion 1 and Criterion 2 will be carried out in the spring season. Due to this situation flora species not assessed in this document.

It should be noted that range data of assessed species were gathered from the IUCN Red List Database.

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

To assess whether or not the Project triggers CH under Criterion 1, a comprehensive list of CR, EN and VU species of the AoA has been developed based on the baseline data and listed in Table 6-1.

Table 6-1. Assessment of Criterion 1

Species Name	IUCN	Population Trend	Observation / Literature	Extent of Occurrence (EOO) (km ²)	EOO within AoA (km ²)	Percentage of global population in AoA	Evaluation / Notes
Invertebrates							
<i>Ceriagrion georgifreyi</i>	EN	Decreasing	L	56610,50	6110,50	10.79	This species was not observed but the presence of this species is possible within the AoA. Its presence should be confirmed in the spring season. This proportion of the population meets the threshold for Critical Habitat Criterion 1a (precautionarily).
<i>Chromovalgus peyroni</i>	VU	Unknown	L	14505,14	1071,90	7,39	This species was not observed but the presence of this species is possible within the AoA. Its presence should be confirmed in the spring season. This proportion of the is large enough that their loss would result in the Red List status changing to Endangered. The AoA is therefore

Species Name	IUCN	Population Trend	Observation / Literature	Extent of Occurrence (EOO) (km ²)	EOO within AoA (km ²)	Percentage of global population in AoA	Evaluation / Notes
							considered of sufficient value for it to qualify as Criterion 1b (precautionarily)
<i>Nosodomodes syriacus</i>	VU	Unknown	L	11415,54	2842,20	24,90	This proportion is large enough that their loss would result in the Red List status changing to Endangered The AoA is therefore considered of sufficient value for it to qualify as Criterion 1b (precautionarily)
Fishes							
<i>Acanthobrama centisquama</i>	CR	Unknown	L	88516,79	6928,06	7,83	This proportion of the population meets the threshold for Critical Habitat Criterion 1a
<i>Anguilla anguilla</i>	CR	Decreasing	O	32026667,79	37354,59	0,12	The AoA is not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1a
<i>Capoeta barroisi</i>	EN	Decreasing	O/L	38437,03	3215,33	8,37	This proportion of the population meets the threshold for Critical Habitat Criterion 1a
<i>Chondrostoma kinzelbachi</i>	EN	Decreasing	L	88516,79	6928,06	7,83	This proportion of the population meets the threshold for Critical Habitat Criterion 1a
<i>Cobitis evreni</i>	EN	Decreasing	O/L	6385,84	4046,22	63,36	This proportion of the population meets the threshold for Critical Habitat Criterion 1a
<i>Cobitis levantina</i>	EN	Decreasing	O/L	96759,85	6928,06	7,16	This proportion of the population meets the threshold for Critical Habitat Criterion 1a
<i>Cobitis turcica</i>	EN	Decreasing	L	95697,03	107,77	0,11	The AoA is not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1a
<i>Cyprinus carpio</i>	VU	Decreasing	L	27863324,56	37353,82	0,13	This proportion is not large enough that their loss would result in the Red List status changing to Endangered The AoA is therefore not considered of

Species Name	IUCN	Population Trend	Observation / Literature	Extent of Occurrence (EOO) (km ²)	EOO within AoA (km ²)	Percentage of global population in AoA	Evaluation / Notes
							sufficient value for it to qualify as Critical Habitat under Criterion 1b
<i>Luciobarbus subquincunciatus</i>	CR	Decreasing	L	372276,85	699,01	0,19	The AoA is not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1a
<i>Oxynoemacheilus seyhanensis</i>	CR	Decreasing	O	31300,64	54,00	0,17	The AoA is not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1a
<i>Oxynoemacheilus seyhanicola</i>	EN	Decreasing	L	8190,89	1041,27	12,71	This proportion of the population meets the threshold for Critical Habitat Criterion 1a
<i>Pseudophoxinus anatolicus</i>	EN	Decreasing	L	80977,85	107,77	0,13	The AoA is not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1a
<i>Pseudophoxinus firati</i>	EN	Decreasing	L	5045,89	unknown	0,00	There are literature records in the Seyhan and Ceyhan basins. However, it has not been observed in the field studies. The AoA is not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1a
<i>Pseudophoxinus zekayi</i>	VU	Decreasing	O	5817,85	5753,10	98,89	This proportion of the population meets the threshold for Critical Habitat Criterion 1a
Reptiles							
<i>Testudo graeca</i>	VU	Unspecified	L	3167528,54	37231,86	1,18	This proportion is not large enough that their loss would result in the Red List status changing to Endangered The AoA is therefore not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1b
Birds							
<i>Aquila heliaca</i>	VU	Decreasing	L	55549539,44	37231,74	0,07	This proportion is not large enough that their loss would result in the Red List status changing to Endangered

Species Name	IUCN	Population Trend	Observation / Literature	Extent of Occurrence (EOO) (km ²)	EOO within AoA (km ²)	Percentage of global population in AoA	Evaluation / Notes
							The AoA is therefore not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1b
<i>Aquila nipalensis</i>	EN	Decreasing	L	42218295,83	37231,90	0,09	The AoA is not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1a
<i>Aythya ferina</i>	VU	Decreasing	L	63026740,00	6877,35	0,01	This proportion is not large enough that their loss would result in the Red List status changing to Endangered The AoA is therefore not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1b
<i>Clanga clanga</i>	VU	Decreasing	O	550724,48	129	0,02	This proportion is not large enough that their loss would result in the Red List status changing to Endangered The AoA is therefore not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1b
<i>Falco cherrug</i>	EN	Decreasing	L	55643272,05	37231,74	0,07	The AoA is not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1a
<i>Neophron percnopterus</i>	EN	Decreasing	O	35544909,72	37348,33	0,11	The AoA is not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1a
<i>Oxyura leucocephala</i>	EN	Decreasing	L	21140463,62	37231,76	0,18	The AoA is not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1a
<i>Streptopelia turtur</i>	VU	Decreasing	O	42645647,13	37231,86	0,09	The AoA is not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1a

Species Name	IUCN	Population Trend	Observation / Literature	Extent of Occurrence (EOO) (km ²)	EOO within AoA (km ²)	Percentage of global population in AoA	Evaluation / Notes
Mammals							
<i>Capra aegagrus</i>	VU	Stable	L	1764077,70	11745,22	0,67	This proportion is not large enough that their loss would result in the Red List status changing to Endangered The AoA is therefore not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1b
<i>Miniopterus schreibersii</i>	VU	Decreasing	L	3550407,60	15149,75	0,43	This proportion is not large enough that their loss would result in the Red List status changing to Endangered The AoA is therefore not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1b
<i>Myotis capaccinii</i>	VU	Decreasing	L	2142525,20	11102,97	0,52	This proportion is not large enough that their loss would result in the Red List status changing to Endangered The AoA is therefore not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1b
<i>Rhinolophus mehelyi</i>	VU	Decreasing	L	3159711,65	29543,16	0,93	This proportion is not large enough that their loss would result in the Red List status changing to Endangered The AoA is therefore not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1b
<i>Ursus arctos</i>	VU	Stable	L	131748934,30	21565,75	0,02	This proportion is not large enough that their loss would result in the Red List status changing to Endangered The AoA is therefore not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1b

Species Name	IUCN	Population Trend	Observation / Literature	Extent of Occurrence (EOO) (km ²)	EOO within AoA (km ²)	Percentage of global population in AoA	Evaluation / Notes
<i>Vormela peregusna</i>	VU	Decreasing	L	14635521,22	19222,64	0,13	This proportion is not large enough that their loss would result in the Red List status changing to Endangered The AoA is therefore not considered of sufficient value for it to qualify as Critical Habitat under Criterion 1b

Species that are strictly protected at the national level according to the “Central Hunting Commission” are included only in bird species. The extent of occurrence of these species is very large, so there is no species that can trigger 1c.

Distribution maps of Critical Habitat qualifying species are given in Annex-B

6.2 Criterion 2: Endemic and/or Restricted-Range Species

To assess whether or not the Project triggers CH under Criterion 2, a comprehensive list of Endemic and/or Restricted-Range Species of the AoA has been developed based on the baseline data and listed in Table 6-2.

Table 6-2. Assessment of Criterion 2

Species Name	Observation / Literature	Extent of Occurrence (EOO) (km ²)	EOO within AoA (km ²)	Percentage (≥10%)	Evaluation / Notes
Invertebrates					
<i>Chromovalgus peyroni</i>	L	14505,14	1071,90	7,39	This proportion is not large enough to support Criterion 2.
<i>Nosodomodes syriacus</i>	L	11415,54	2842,20	24,90	This proportion of the population meets the threshold for Criterion 2
Fishes					
<i>Acanthobrama thisbeae</i>	L	Unknown	Unknown	-	There are literature records in the lower Ceyhan River in Turkey and lower Orontes drainage. However, it has not been observed in field studies. Presence of the species needs to be assessed in spring season
<i>Alburnus kotschy</i>	O/L	Unknown	Unknown	-	There are literature records in the Seyhan and Ceyhan basins. Presence of the species needs to be assessed in spring season
<i>Capoeta barroisi</i>	O/L	38437,03	3215,33	8,37	This proportion is not large enough to support Criterion 2.
<i>Capoeta erhani</i>	L	11504,30	11424,82	99,31	It seems core population of this species located in the AoA. This proportion of the population meet the threshold for Criterion 2
<i>Capoeta turani</i>	L	12048,56	4864,48	40,37	This proportion of the population

Species Name	Observation / Literature	Extent of Occurrence (EOO) (km ²)	EOO within AoA (km ²)	Percentage (≥10%)	Evaluation / Notes
					meets the threshold for Criterion 2
<i>Chondrostoma ceyhanense</i>	O/L	Unknown	Unknown	-	There are literature records in the Ceyhan, Seyhan and Berdan rivers. Presence of the species needs to be assessed in spring season
<i>Cobitis evreni</i>	O/L	6385,84	4046,22	63,36	It seems core population of this species located in the AoA. This proportion of the population meets the threshold for Criterion 2
<i>Luciobarbus lorteti</i>	L	20897,15	1356,58	6,49	This proportion is not large enough to support Criterion 2.
<i>Oxynoemacheilus samanticus</i>	O/L	Unknown	Unknown	-	There are literature records in the Kizilirmak river drainage in the Black Sea basin and Samanti, a headwater of Seyhan River in the Mediterranean basin. Population of the species needs to be assessed in spring season
<i>Oxynoemacheilus seyhanicola</i>	L	8190,89	1041,27	12,71	This proportion of the population meets the threshold for Criterion 2
<i>Pseudophoxinus firati</i>	L	5045,89	unknown	0,00	There are literature records in the Seyhan and Ceyhan basins. However, it has not been observed in field studies. Presence of the species needs to be assessed in spring season
<i>Pseudophoxinus zekayi</i>	O/L	5817,85	5753,10	98,89	It seems core population of this species located in the AoA. This proportion of the population meets the threshold for Criterion 2
<i>Squalius adanaensis</i>	L	16322,95	4518,21	27,68	This proportion of the population meets the threshold for Criterion 2
<i>Squalius seyhanensis</i>	O/L	28335,93	13382,40	47,23	This proportion of the population meets the threshold for Criterion 2
Reptiles					
<i>Phoenicolacerta cyanisparsa</i>	L	14080,14	5050,90	35,87	This proportion of the population meets the threshold for Criterion 2
<i>Eirenis aurolineatus</i>	L	9695,97	5931,99	61,18	It seems core population of this species located in the AoA. This proportion of the population meets the threshold for Criterion 2

Distribution maps of Critical Habitat qualifying species are given in Annex-A

6.3 Criterion 3: Migratory or Congregatory Species

It is known that the project site is located directly on the main migration routes of avifauna species. The Project AoI is located within several KBAs; and therefore, it likely to meet the criteria for critical habitat for migratory or congregatory species.

However, due to the lack of updated population data for migratory species, it is not feasible to make an accurate assessment. Therefore, baseline studies to support critical habitat assessment of migratory fauna species according to Criterion 3 will be carried out in the migratory period(s) and periods when species may congregate.

6.4 Criterion 4: Highly Threatened or Unique Ecosystems

None of the ecosystems of Turkey has been assessed according to the IUCN's Red List of Ecosystems. Therefore, there are no available quantitative thresholds for assessing the Project under CH criterion 4.

In respect of Criterion 4b, habitats defined according to EUNIS in the AoA were examined according to the EU Habitats Directive Annex-1 list. The following habitats are listed on Annex-1: "E2.1 Permanent mesotrophic pastures and aftermath-grazed meadows", "G3.7 Lowland to montane Mediterranean Pinus woodland (excluding *Pinus nigra*)" and "H3.6 Weathered rock and outcrop habitats".

Due to the relatively widespread distribution of these habitats in Europe, these habitats are also densely encountered outside the AoA. It was concluded that these habitats do not meet the definitions defined in Criterion 4b.

There are several "Internationally Recognized Areas" which the project passes through. These are;

Mersin Hills KBA

This area is defined as IBA (Important Bird Area) by Birdlife Data Zone. Birdlife indicates that some of the breeding raptors in the area are Lanner Falcon (*Falco biarmicus*), Bearded vulture (*Gypaetos barbatus*), Egyptian vulture (*Neophron percnopterus*), Black kite (*Milvus migrans*), and Caspian snowcock (*Tetraogallus caspius*).

12 plant taxa in the area meet the KBA criteria. Among them, the known world distribution of *Aethionema demirizii* is limited to the northwest of the KBA. *Echinops mersinensis*, *Heptaptera cilicica*, *Linum anisocalyx*, *Phelipanche tzvelevii*, *Salvia quezelii*, *Sideritis cilicica*, *Thlaspi elegans*, *Verbascum linearilobum* plant species endemic to Turkey are also found in the area. Bunny (*Hieraaetus fasciatus*) and rainbow (*Coracias garrulus*) bird species breed in the valleys of the area.

Yılankale Hills KBA

KBA hosts two plant species that are endemic to Turkey; *Heptaptera cilicica* and *Hyacinthella lazulina*. The steep cliffs in the area are important breeding grounds for *Apus affinis* and *Coracias garrulus*. It is an important breeding ground for *Myotis emarginatus*, which is endangered worldwide. On the other hand, it provides KBA status for *Gomphus davidi*, a narrowly distributed species of damselfly endemic to the Mediterranean biome.

Yeşilce KBA

The KBA is one of the richest areas in the Southeast in terms of plant and butterfly species.

Corydalis henrikii, *Hesperis trullata* and *Satureja aintabensis* are plant species that live only in this area and are endangered worldwide. On the other hand, Yeşilce is one of the most important habitats for the *Polyommatus theresia*, one of the butterfly species endemic to Turkey.

Yeşilce KBA is one of the important distribution areas of the *Hyaena hyaena* in Turkey. The rugged and oaky limestone rocks in the area constitute an important shelter for this species. *Emberiza cineracea* and *Oenanthe xanthopyrma* that should be protected on a regional scale are bird species that meet the KBA criteria and attract many observers to the area.

Amanos Mountains KBA

The Amanos Mountains are an internationally important area in terms of being a migration route for birds of prey and gliding and the important bird species it hosts. In addition, the regionally endangered bird species *Halcyon smyrnensis*, *Coracias garrulus*, *Hieratus fasciatus* and *Apus affinis* breeds in the area.

KBA, which is also a special area for butterflies, meets the KBA criteria for 12 butterfly taxa. The area is home to many species such as *Parnassius apollo*, one of the globally endangered butterflies, and *Maniola megala*, which is endemic to our country.

As a result, KBAs associated with the project route are likely to trigger Criterion 4.

It is necessary to monitor these areas in spring and autumn season to assess according to the Criterion 4 Assessment of these areas will also provide input for Criterion 3.

6.5 Criterion 5: Key Evolutionary Processes

The Project is not substantially different from the surrounding landscape in terms of elevation or moisture gradients, or any other geological, ecological or evolutionary factors that would suggest that the area is vital for sustaining unique or distinctive evolutionary processes.

Linear projects such as railways may restrict the passage of particularly large mammal species. This can reduce inter-habitat connectivity and reduce gene flow (such as mobility and migration) between populations of species.

Therefore, the Amanos Mountains, which have a high density of large mammals on the railway route, may trigger Criterion-5.

7 CONCLUSION

The Project triggers a designation of Critical Habitat. These are;

Ceriagrion georgifreyi, *Chromovalgus peyroni*, *Nosodomodes syriacus*, *Acanthobrama centisquama*, *Capoeta barroisi*, *Chondrostoma kinzelbachi*, *Cobitis evreni*, *Cobitis levantina*, *Oxynoemacheilus seyhanicola* and *Pseudophoxinus zekayi* are triggering Criterion 1.

Nosodomodes syriacus, *Capoeta erhani*, *Capoeta turani*, *Cobitis evreni*, *Oxynoemacheilus seyhanicola*, *Pseudophoxinus zekayi*, *Squalius adanaensis*, *Squalius seyhanensis*, *Phoenicolacerta cyanisparsa* and *Eirenis aurolineatus* are triggering Criterion 2.

All the potential CH qualifying flora species could not be observed as there was no vegetation period during the study period. Therefore, critical habitat assessment of flora species according to Criterion 1 and Criterion 2 should be carried out in the spring season.

Due to the out of migration period, migratory fauna species could not be observed during the field studies. Therefore, critical habitat assessment of migratory fauna species according to Criterion 3 should be carried out in the migration period.

It is necessary to monitor the KBAs in spring season to assess according to the Criterion 4. Assessment of these areas will also provide input for Criterion 3.

This report should be re-evaluated in line with the findings of the study to be conducted in the spring term.

Offset strategies should be determined after the re-evaluating the CHA document. Due to the similar limitations, Biodiversity Action Plan (BAP) can be prepared after completion of the complementary Spring season survey to be done in 2022.

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Appendix – A

EUNIS HABITAT MAP

Appendix – B

MAPS OF CH TRIGGERING SPECIES