

ÇILDİR DAM And HEPP FACILITY BIODIVERSITY ACTION PLAN

1.1 Entrance

The Çıldır Dam and Hydroelectric Power Plant Facility is located within the boundaries of Lake Çıldır in the Arpaçay District of Kars Province. The facility is 40 km from the city of Kars and 9 km from the district of Arpaçay. Construction of the Çıldır dam and tunnel began in 1966 and was completed in 1975. The construction of the power plant building and the installation of electromechanical facilities were carried out between 1970 and 1975, with the facility commencing operations on November 14, 1975.

The primary hydrological source for the Çıldır Dam and Hydroelectric Power Plant Facility is Lake Çıldır. Technical information about Lake Çıldır is provided in Table 1.

Table 1: Çıldır Lake Physically Features

Features	Values
Goal volume	118.0 hm ³
Goal Area	120.0 km ²
Maximum Goal Bad	1962.0 m.
Minimum Goal Bad	1959.50 m.

Çıldır Dam and Hydroelectric Power Plant Facility The water in Çıldır Lake is 4225 m. It is transferred to the Balance Chimney through a tunnel of length 2.2 m. diameter and 630 m. It is transmitted to the turbines through a long penstock. The physical properties of the dam structure created to hold the delivered water are given in **Table 2**.

Table 2: Çıldır Dam Features And Values

Features	Values
Barrage Type	Hair nucleated Soil Filling (DSI Made by
Body volume	61,280 m ³
Crest Height	12.0 m.
Crest Lower Width	30.0 m.
Crest Top Width	7.0 m.

Features	Values
Barrage body Crest length	80.0 m.
This Taking facility	Private building, only entrance built, This entrance cross section $\approx 3.5 \times 4\text{m}$
This Taking covers	MOQ: one, Lid width $\approx 3.5 \text{ m}$, Lid height $\approx 3.5 \text{ m}$.

Çıldır Dam and Hydroelectric Power Plant Facility has three units with the dam features specified in **Table 2** , each with a power of 5.12 MW and a total installed power of 15.36 MW, producing electricity with an annual production capacity of 48,000,000 kWh.

Taşlıoğlu Village is located approximately 0.7 km from the project site from a bird's eye view. In addition, from a bird's eye view, there is Kuzgunlu Village approximately 2 km away from the project site, Gönülalan Village 1.55 km away, Melikköyü 2 km away and Burcalı Village 4 km away. In addition, from a bird's eye view, the important centers of Çıldır are 24 km away from the project site, Kars is 40 km away and Aradahan is 51 km away (Figure 3-4).

There are important wetlands around the project site. 2.5 as the crow flies to the project site km from Yavaş Lake and 3 km from in the distance Weed lake There are (Figure 5).

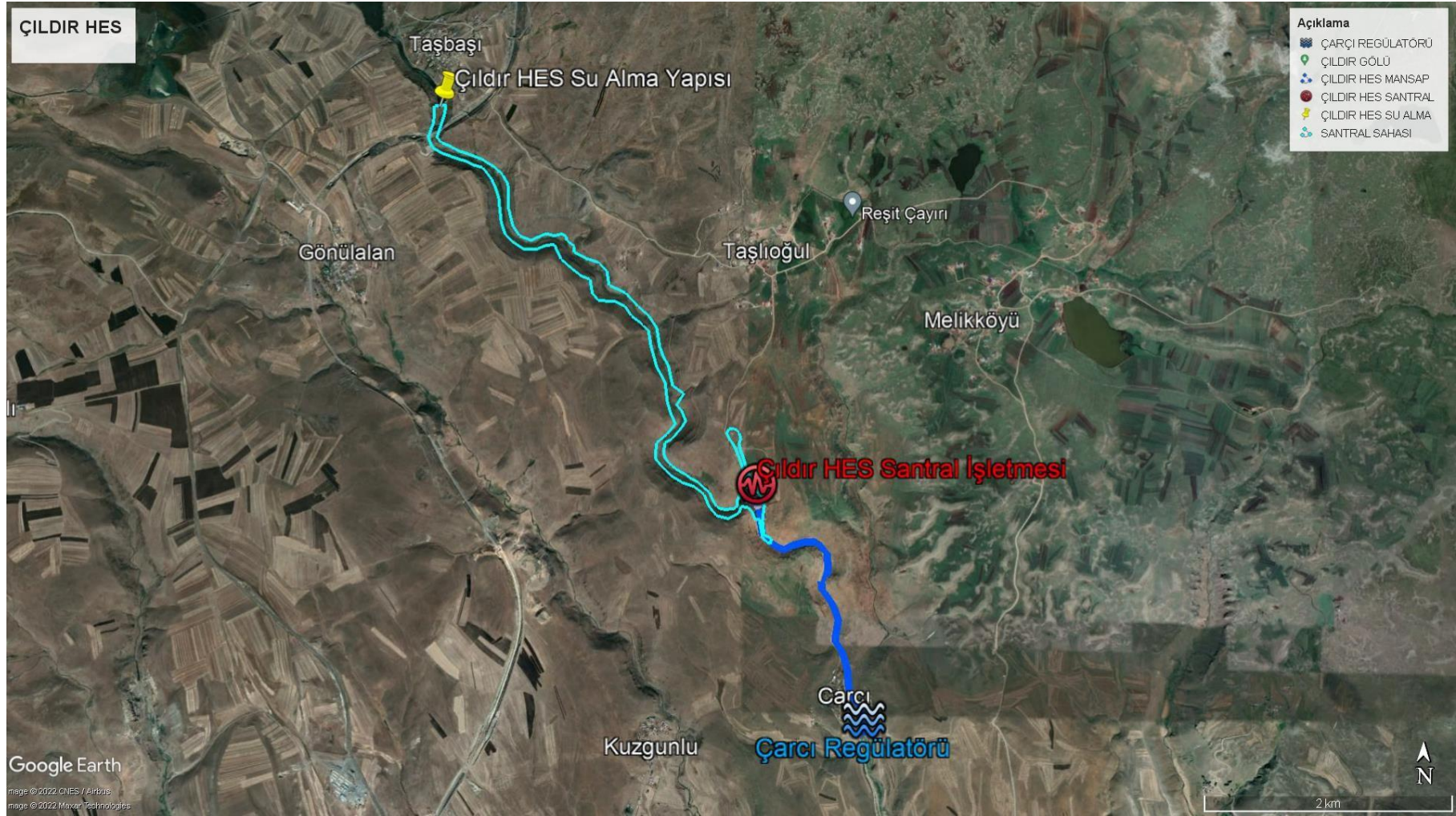


Figure 1: Satellite Image of the Project Site



Figure 2: Satellite Image of the Project Field



Figure 3: Village (Neighborhood) Settlements in the Vicinity of the Project Site



Figure 4: Settlements Near the Project Site

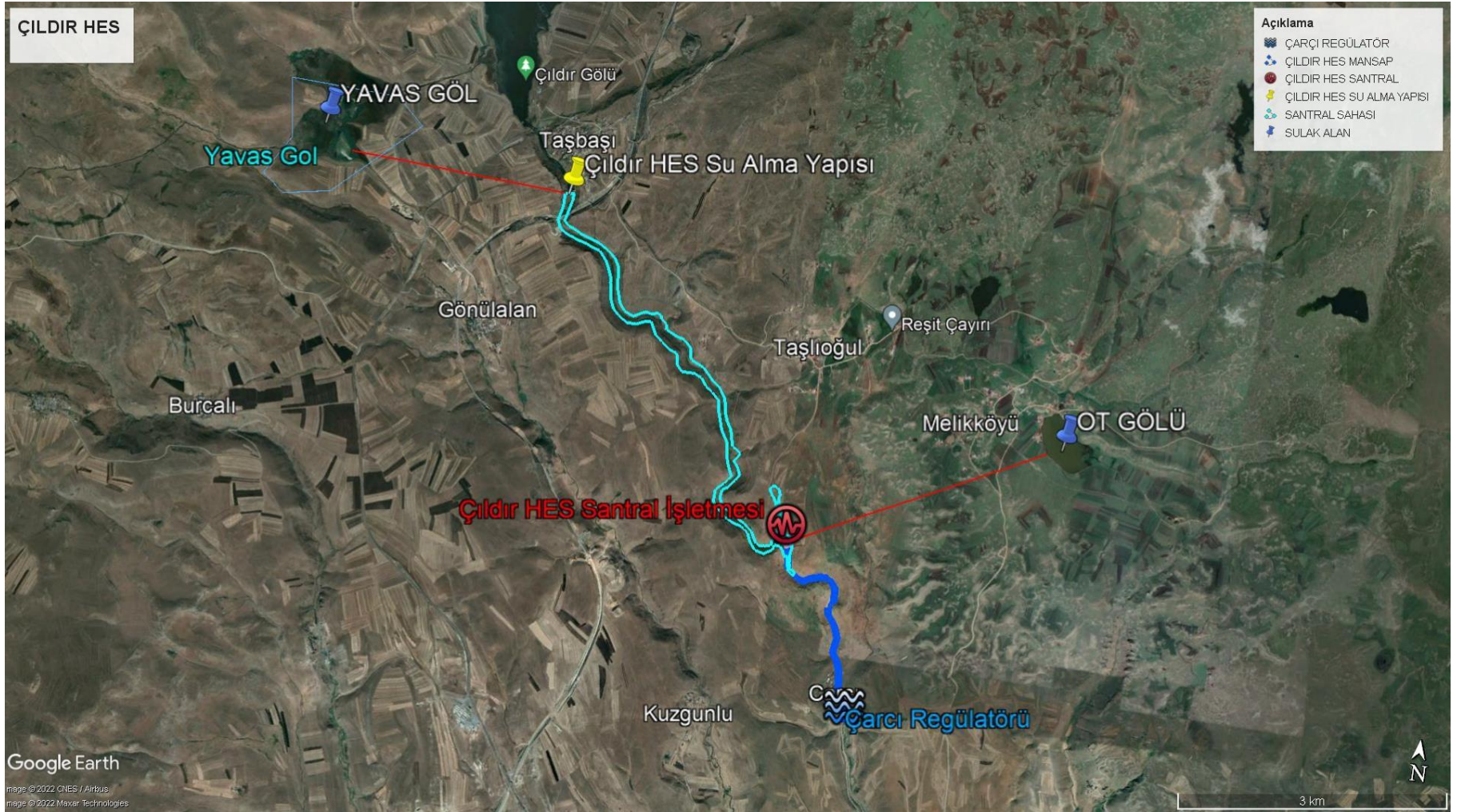


Figure 5: Significant Water Bodies Surrounding the Project Area

1.2 Relationship of the Area with Protected and Special Status Areas

When evaluating the ıldır Hydroelectric Power Plant (HPP) site and its surrounding protected areas and important natural areas, it is found that Kuyucuk Lake is approximately 18 km away from the project site, and Aygır Lake is 27 km away. Additionally, the Kars Plain is located 19 km away, Allahuekber Mountains are 26 km away, and Ardahan Forests Important Nature Area is 38 km away from the project site (Figures 6-7).



Figure 6: Satellite Image Showing the Relationship Between the Project Site and Protected Areas

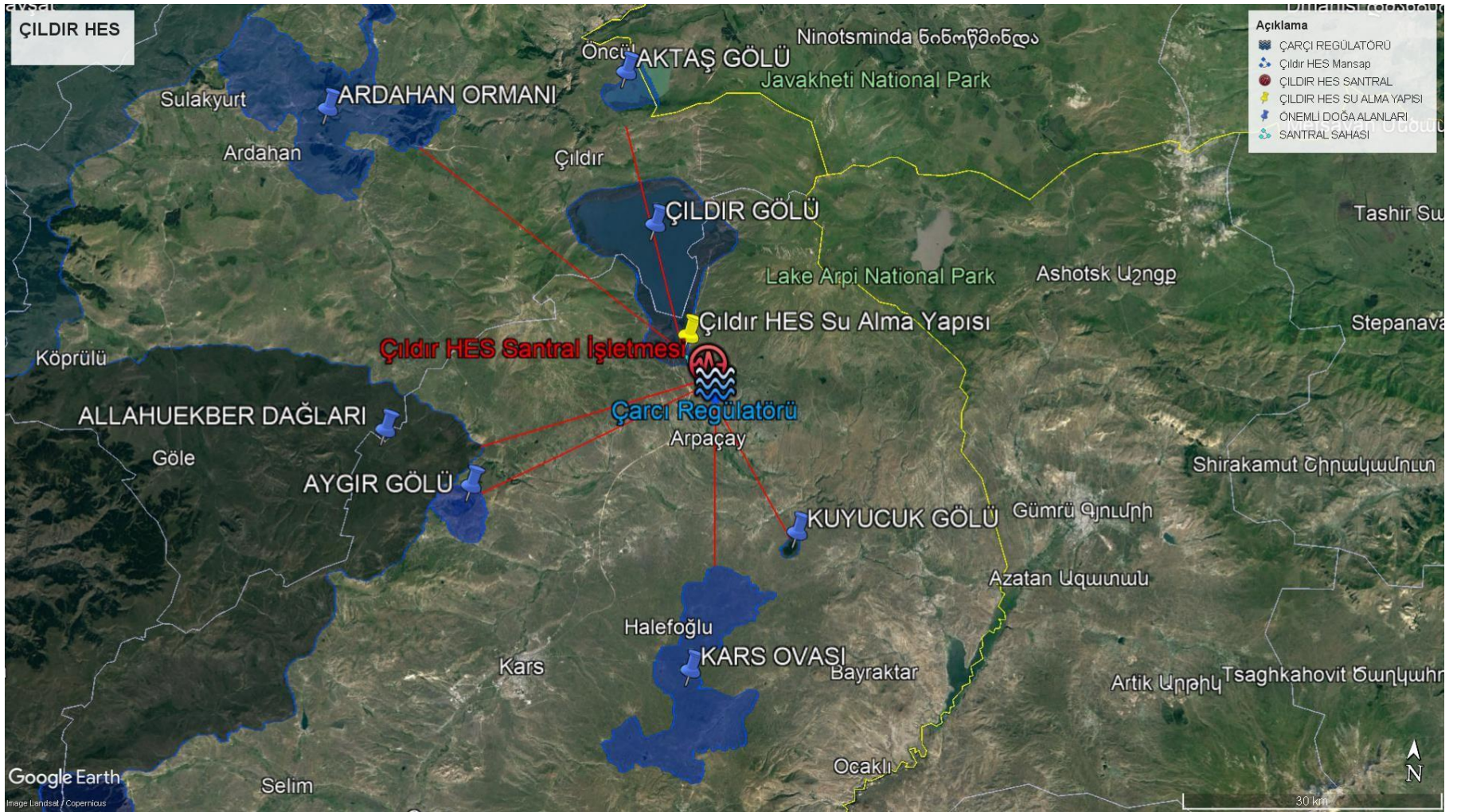
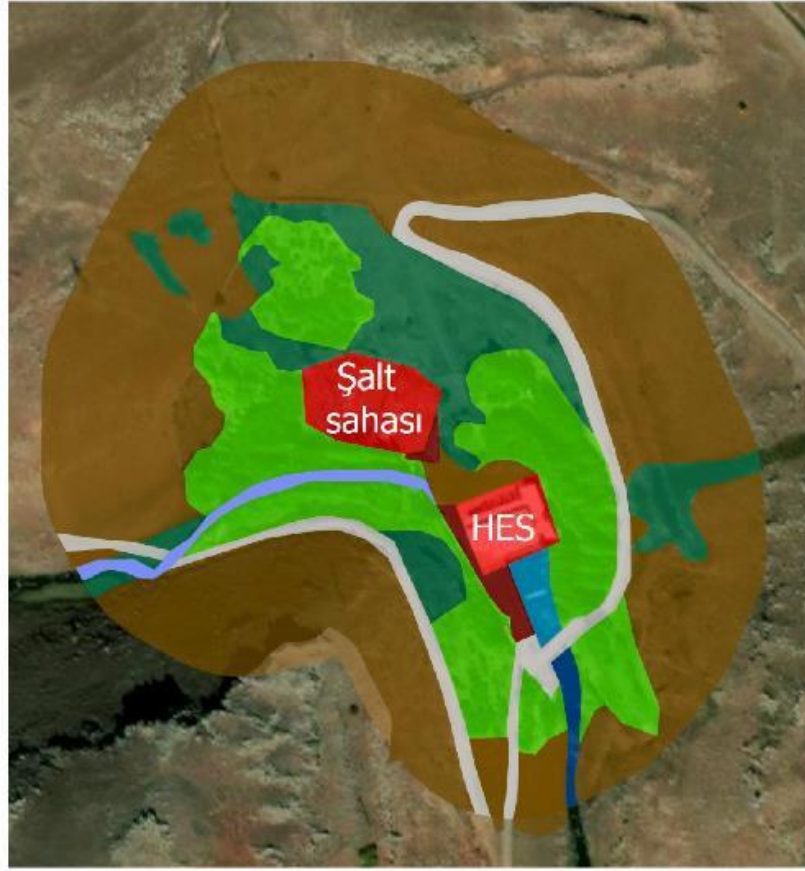


Figure 7: Satellite Image Showing the Relationship Between the Project Site and Protected Areas

1.3 Identification and Classification of Habitats in the Impact Area of the ıldır Dam and HPP Facility

The ıldır Dam and Hydroelectric Power Plant (HPP) project, operated by Zorlu Doğal Elektrik Üretimi A.Ş., is located within the boundaries of Lake ıldır in the Arpaay District of Kars Province.

There are 10 different habitat types within the project area. Of these habitats, 7 are natural, while the remaining 3 are classified as modified habitats. The vegetation types that have developed in the natural areas are classified according to the EUNIS Habitat Classification with 1st, 2nd, and 3rd Level codes. The vegetation types are provided below (Figures 8-9).



Çıldır HES EUNIS Habitat Haritası 1

Ölçek: 1:6,250

- ** ■ Tesis binaları
- * ■ C2.3: Mevsimsel olmayan, yavaş akan su boyları
- * ■ C2.5: Mevsimsel akarsular
- * ■ E3: Mevsimsel ıslak çayırlar, ıslak çayırlar
- * ■ G4: Karışık ormanlar
- * ■ H3: Sarp yamaçlar ve ana kayanın yüzeye çıktığı taşlık alanlar
- * ■ H5: Bitki örtüsü seyrek açıklık alanlar
- ** ■ J4.2: Yol ağları
- ** ■ J4.6: Kaldırımlar, beton yüzeyler ve rekreasyon alanları
- ** ■ J5.41: İnsan yapımı tatlı su kanalları



0 125 250
Meters

Figure 8: Çıldır HPP EUNIS Habitat Map 1



Çıldır HES EUNIS Habitat Haritası 2

Ölçek: 1:4,000

- ** ■ Tesis binaları
- * ■ C2.3: Mevsimsel olmayan, yavaş akan akarsular
- * ■ C2.5: Mevsimsel akarsular
- * ■ E3: Mevsimsel ıslak çayırlar, ıslak çayırlar
- * ■ G5: Antropojenik ormanlar, baltalıklar, ağaç hatları
- * ■ H3: Sarp yamaçlar ve ana kayanın yüzeye çıktığı taşlık alanlar
- * ■ H5: Bitki örtüsü seyrek açıklık alanlar
- ** ■ J4.2: Yol ağları
- ** ■ J4.6: Kaldırımlar, beton yüzeyler ve rekreasyon alanları
- ** ■ J5.41: İnsan yapımı tatlı su kanalları



0 75 150
Meters

Figure 9: Çıldır HPP EUNIS Habitat Map 1

➤ Natural habitats

C2.3 seasonal Non, Fast Flowing streams And C2.5 seasonal streams

Since these two habitats contain common plant taxa, they have been evaluated under one heading. *Trifolium pratense* var. *pratense*, *Ranunculus arvensis* , *Ranunculus repens* , *Salix triandra* subsp. *triandra*, *Lagotis stolonifera* , *Veronica anagallis-aquatica* subsp. *lysimachioides* , *Carex supina* , *Eleocharis palustris* , *Bellevallia sarmatica* , *Colchicum szovitsii* , *Gagea taurica* , *Ornithogalum oligophyllum* , *Calamagrostis pseudophragmites* , *Poa angustifolia* , *Zingeria biebersteiniana* subsp. *trichopoda* and *Falcaria vulgaris* taxa are distributed in these habitats.



Photos one seasonal Non, Fast Flowing streams (EUNIS:C2.2)

E3 seasonal Wet meadows, Wet meadows

These habitats are observed at the edges of the derby at an altitude of 1850 m. Plant taxa detected in these habitats; *Ranunculus caucasicus* subspecies *subleiocarpus*, *Ranunculus kotschyi*, *Thalictrum minus* variety *eripoda*, *Arenaria gypsophiloides* variety *glabra*, *Stellaria persica*, *Gypsophila nabelekii*, *Lathyrus cyaneus* variety *cyaneus*, *Lathyrus pratensis*, *Trifolium trichocephalum*, *Filipendula ulmaria*, *Geum rivale* , *Epilobium confusum*, *Astrantia maxima* subspecies *maxima*, *Grammosciadium daucoides*, *Seseli peucedanoides*.



Photos 2 seasonal Wet meadows, Wet meadows (EUNIS:E3)

G4 Mixed Forests

There are some plantation mixed forest communities that continue their existence as a community in the habitats where there are moist meadows at 1850 m around the HEPP site. *Pinus sylvestris*, *Populus alba*, *Salix alba*, *Acer platanoides*, *Prunus spinosa*, *Prunus divaricata*, *Cerasus angustifolia*, *Malus sylvestris*, *Pyrus elaeagnifolia*, *Fraxinus excelsior* .



Photos 3 Mixed Forests (EUNIS:G4)

G5 anthropogenic Forests, coppice Forests

G4 in its habitat spread showing type of composition like features shows.

H3 Steep slopes, Mother of the rock to the surface dating Gizzard Fields

Plant taxa distributed in these habitats detected at an altitude of 1890 m around the Hes field; *Aethionema elongatum*, *Fibigia clypeata*, *Hesperis bicuspidata*, *Sisymbrium loeselii*, *Saponaria orientalis*, *Rheum ribes*, *Linum mucronatum subspecies armenum*, *Erodium absinthoides subspecies armenum*, *Lathyrus pallescens*, *Onobrychis radiata*, *Potentilla fruticosa subspecies floribunda*, *Cotoneaster nummularia*, *Sedum subulatum*, *Bunium microcarpum subspecies bourgaei* is.

H5 Herb Cover Rare Openness Fields

These habitats with weak vegetation cover were detected at 1850 m; *Amaranthus retroflexus*, *Astrodaucus orientalis*, *Eryngium billardieri*, *Eryngium caeruleum*, *Achillea biebersteinii*, *Artemisia austriaca*, *Centaurea depressa*, *Centaurea iberica*, *Centaurea pseudoscabiosa subsp. glehnii*, *Centaurea pseudoscabiosa subsp. pseudoscabiosa*, *Centaurea virgata*, *Onosma armeniacum*, *Alyssum desertorum var. desertorum*, *Erophila verna subsp. verna*, *Arenaria cucubaloides*, *Dianthus crinitus var. crinitus*, *Sedum subulatum*, *Cephalaria microcephala*, *Scabiosa columbularia subsp. ochroleuca var. ochroleuca*, *Astragalus microcephalus*, *Lathyrus pallescens* and *Lotus corniculatus var. corniculatus* have been identified.



Photos 4 Steep slopes, Mother of the rock to the surface dating Gizzard Fields (EUNIS: H3)

➤ **Modified Habitats**

Areas with habitat codes J4.2, J4.6, J5.41 are either concrete or asphalt and do not have a floral content. However, cleaning the seeds that germinate in the cracks in these structures is important for the integrity of the system.



Photos 5 Facility building



Photos 6 Person making Freshwater channels (EUNIS: J5.41)

When we look at the vegetation of the project site and its surroundings; There are seasonally wet meadows around the streamside vegetation and groves formed by small tree communities with a fragmentary distribution around them. Their surroundings are composed of sparsely distributed steppe formations and vegetative cover communities in rocky and stony habitats that increase with the slope.

➤ **Aquatic Habitats**

Habitat degradation and decline in aquatic ecosystems is increasing day by day due to anthropogenic and climate change. Interventions in the water regime, deterioration of water quality, poaching, and uncontrolled activities damage aquatic creatures and the habitats around them. It is important to have information about the spatial distribution of habitats and map habitats in order to understand, control and manage human impact on aquatic ecosystems.

In the classification of aquatic habitats in the area, the most current version of the EUNIS Habitat Classification was taken into consideration and an appropriate classification was made. This method of classification is a method that allows broader analysis of habitats in relation to ecological zones, climate, soil and pressures on the environment, as well as species, as well as being a way of comparing data with other countries, as well as using a standardized terminology. organized in main categories and their subheadings .

No special habitat type was found in the Çıldır HEPP area during the investigations and studies. Semi-natural habitats stand out in the regulator and power plant areas. Other areas are natural habitats along the stream. Fish that feed on algae, zooplankton or benthic creatures living in the area are at the top of the chain in the water. Fish habitats in the Çıldır HEPP area where observations were made are given in Table 3.

Table 3 go crazy HEPP aquatic habitat And Features

EUNIS CODE	HABITAT NAME	FEATURES	RAID SPECIES
C2	surface streams	in the field Other Permanent or Seasonal Streams, This Habitat They are representatives of their type in the field	Top Trout generation; <i>salmo macrostigma</i> , Lower Trout generation; Trout And Golyan (Pearl) snapper (<i>Alburnoides bipunctatus</i>) moustachioed Fish Generation: moustachioed fish (<i>Barbus lacerta</i>), woodfish (<i>Acanthobrama marmid</i>) and roughhead (<i>Chondrostoma regium</i>), freshwater mullet (<i>Squalius cephalus</i>) type diversity more is too much.

Stream bed general aspect natural habitat looks like (Photo 8). go crazy HEPP The deteriorated habitat structures in the vicinity have adapted to the natural environment since there has been no external influence to date .



Photos 7 go crazy HEPP in the field Exit juice around Semi-Natural habitat Structure



Photos 8 Project Area around Natural aquatic habitat Structure

1.4 Identification of Floristic Biodiversity in Çıldır Dam and HEPP Facility Impact Area

When we look at the vegetation of the project site and its surroundings; There are seasonally wet meadows around the streamside vegetation and groves formed by small tree communities with a fragmentary distribution around them. Their surroundings are composed of sparsely distributed steppe formations and vegetative cover communities in rocky and stony habitats that increase with the slope.

Considering the IFC PS-6 and Guidance Note 6 criteria for the Project Area and Environment, there are no plant taxa with CR and EN status within the scope of the IUCN convention, and since there are no plant taxa within the scope of the Bern and CITES conventions, there is no critical habitat in terms of species conservation.

1.5 Identification of Faunistic Biodiversity in the Impact Area of Çıldır Dam and HEPP Facility

1.5.1 Amphibian

Project in the field generation in danger and/or endemic amphibian Type There is no. in the field The amphibian species found are common species. Çıldır lake and the stream environment after the HEPP and Cansuyu stream seem to be quite suitable for amphibians. During the field work, abundant *Pelophylax ridibundus* (Low frog) and *Rana macrocnemis* (Uludağ frog) were observed. No negative effects or precautions that need to be taken for amphibians were observed in the project area.

Criterion 1: Refers to Critically Endangered (CR) and/or Endangered (EN) Species. There are no amphibian species in the CR and/or EN category in the project area.

Criterion 2: Refers to Endemic and/or Narrowly Ranged Species. There are no endemic and/or narrow-range amphibian species in the project area.

Criterion 3: Refers to Migratory and/or Community Concentrated Species. There is no amphibian species in the project area that meets this criterion.

Criterion 4: Refers to Highly Threatened and/or Uniquely Rare Ecosystems. Important habitats for amphibian species in the project area are aquatic habitats. The project has been operating in the area for many years. Life water is released into the stream bed. The river environment is largely composed of natural habitats. is formed. In the current situation, it is not possible to say that the river habitat and its immediate surroundings are under high threat.

1.5.2 Reptiles

There are no endemic reptile species in the project area. According to IUCN lists, the only reptile species that is vulnerable to extinction is **the Tortoise (*Testudo graeca*)** and is listed in the VU category. Tortoise is also included in the BERN Convention ANNEX-II and CITES ANNEX-II lists. The area also has a distribution of the Lesser Viper (*Vipera eriwanensis*), which is listed in the VU category by the IUCN. This species is also included in the BERN Convention ANNEX-II list .

Mauremys caspica, *Natrix tessellata* and *Natrix natrix*, which are partially or largely water-dependent reptile species . The impact of these species may be due to the decrease in water in the stream bed due to water retention by dams and not enough water being released into the stream bed. However, electricity production Since water is constantly released from the dam to the stream bed for the purpose of No negative effects were observed.

In this context, critical habitat assessment of the project area was made in line with faunistic data. If we do;

Criterion one: Critical Endangered (CR) And/Or Danger Below (EN) Types expresses. **There are no** reptile species in the CR and/or EN category in the project area .

Criterion 2: Refers to Endemic and/or Narrowly Ranged Species. **There is no** endemic or narrow-ranging reptile species in the project area .

Criterion 3: Refers to Migratory and/or Community Concentrated Species. **There is no** reptile species in the project area that meets this criterion .

Criterion 4: Refers to Highly Threatened and/or Uniquely Rare Ecosystems. The important habitat types for reptile species in the project area are the natural habitats in the region. The project has been operating in the area for many years. Natural habitats in the project area have not been negatively affected by the project. Since the project has been in operation for many years, the negative effects that occurred during the construction phase seem to have largely returned to normal. Currently, no adverse effects **have been observed on the reptile species widespread in the region** .

1.5.3 Mammals

Lynx (*Lynx lynx*) , one of the species likely to be distributed in the region, is listed in the EN category according to the IUCN Mediterranean evaluation. However, the project area remains outside the IUCN Mediterranean evaluation area, the Mediterranean area is generally It covers the Aegean, Marmara and Mediterranean regions. This species is not listed as endangered in the global assessment. Despite this, in this report, this species is considered to be a Critical species and an evaluation has been made here. Although it is not endangered, an important mammal species for the project area **is the Otter** . Switchboard employees It confirmed the presence of otters in the region. The IUCN criterion for the species is NT and the Bern Convention criterion is Annex II. In other words, it is a fauna species that must be protected.

Criterion 1: Refers to Critically Endangered (CR) and/or Endangered (EN) Species. **There are no** mammal species in the CR and/or EN category in the project area .

Criterion 2: Refers to Endemic and/or Narrowly Ranged Species. There are no endemic and/or narrow-range mammal species in the project area.

Criterion 3: Refers to Migratory and/or Community Concentrated Species. **There is no** mammal species in the project area that meets this criterion .

Criterion 4: Refers to Highly Threatened and/or Uniquely Rare Ecosystems. The important habitat types for mammal species in the project area are the natural habitats and stream beds in the region. The project has been operating in the area for many years. Natural habitats in the region have not been negatively affected by the project. Since the project has been in operation for many years, the negative effects that occurred during the construction phase seem to have largely returned to normal. Currently, no adverse effects **have been observed on mammal species distributed in the region** .

Criterion 5: Topography, geology, soil, temperature, vegetation, and combinations of these factors One of the region structural features species local to take shape And ecological features It can affect the evolutionary processes that lead to In some cases, distinctive spatial features form populations or subpopulations of genetically unique plant and animal species. associated with their populations. Physical or spatial features have been identified as spatial catalysts for evolutionary and ecological processes, and such features are often associated with species diversity. Species (or subpopulations of species) that emerge due to the maintenance of basic evolutionary processes inherent in an area have become the main focus in recent years, along with the conservation of biodiversity, especially the process of preserving genetic diversity. By maintaining species diversity in an area, the genetic diversity within species as well as the processes that drive speciation ensure evolutionary resilience in a system, which is especially important in rapidly changing climate conditions.

For illustrative purposes, here are some potential examples of areal features associated with evolutionary processes,

Regions with high spatial heterogeneity are a positive force for speciation, as species are naturally selected for their ability to adapt and diversify.

Environmental gradients, also known as ecotones, produce transitional habitat that is associated with the process of speciation and high species and genetic diversity.

Edaphic interfaces are the formation of soil types (e.g. serpentine outcrops, limestone) that lead to the formation of unique plant communities characterized by both rarity and endemism. and gypsum sediments) are special sequences.

Connection between habitats (e.g. biological corridors), especially fragmented It is important in the maintenance of habitats and metapopulations and ensures species migration and gene flow. This connectivity also includes biological corridors across elevational and climate gradients and “crest to coast.”

Areas with proven importance for adaptation to climate change for both species and ecosystems are also included in this criterion.

The importance of structural features in an area that can influence evolutionary processes will be determined on a case-by-case basis, and the determination of critical habitat will be largely based on scientific knowledge. In many cases, this criterion will apply to areas that have been previously investigated and are known or suspected to be associated with unique evolutionary processes. Although systematic methods exist to measure and prioritize evolutionary processes in a field, these methods are beyond the reasonable conditions of evaluations typically conducted by the private sector.

Criterion 5 was evaluated together for Amphibians, Reptiles and Mammals. Criterion 5 involves evaluating whether the region generally contains significant evolutionary processes. The area where Çıldır HEPP is located does not show a special evolutionary process. The region does not have a special geological structure or a special history and therefore does not contain many critical and/or endemic species. In this regard, the area **does not meet** Criterion 5 .

1.5.4.Ornithology

As a result of the studies, a total of 106 bird species were identified in the project area and its immediate surroundings. The list of these species, their global Red List status, and the species' status in BERN, CITES and 2022 MAK decisions are given in Table 4 below.

Located around the facility from species 3 of them generation global is under threat on a large scale. This species are Applehead Pochard (*Aythya ferina*), Hornbill (*Oxyura leucocephala*) and Steppe Eagle (*Aquila nipalensis*). While the Applehead Pochard (*Aythya ferina*) is VU “vulnerable” according to the IUCN criteria, the Hornbill (*Oxyura leucocephala*) and Steppe Eagle (*Aquila nipalensis*) are EN “Endangered”.

Of the species found around the facility, 65 are in BERN Agreement Annex-2, 31 are in BERN Agreement Annex-3, 1 is in CITES Annex-1, 11 are in CITES Annex-2 and 3 are in CITES Annex-3. It is located in.

In this context, if we make a critical habitat assessment of the project area in line with faunistic data;

Criterion 1: Habitats Important to Critically Endangered (CR) or Endangered (EN) Species

Hornbill (*Oxyura leucocephala*) and Steppe Eagle (*Aquila nipalensis*) The species have a global Red List status of “EN” endangered species. In order for this criterion to be evaluated properly, very detailed scientific studies aimed at making population size estimates are required in the region (see Biodiversity Action Plan).

Criterion 2: endemic And Narrow widespread Species For Important Habitats

The birds found around the facility do not trigger this criterion.

Criterion 3: Habitats Hosting Globally Significant Numbers of Migratory and Foraging Species

It has been determined that there are migratory birds among the listed species in and around the facility area. Considering the topographic location of the facility, the project is not expected to cause a serious problem for migratory bird populations.

Criterion 4: High at level Threatening under And/Or Unique Rare Ecosystems

None of the habitats around the site are listed as high level or unique ecosystems on the IUCN Red List of Ecosystems and therefore this criterion will not be triggered.

Criterion 5: Important Evolutionary Processes With identified habitats

Çıldır HEPP facilities do not differ significantly from the surrounding region in terms of elevation, moisture gradients, or any other geological, ecological, or evolutionary factor that indicates that the region is vital for sustaining unique or distinctive evolutionary processes. Therefore, none of the habitats around the facility trigger Criterion 5.

Table 4: Bird Species Present and Likely to be Found in the Project Site

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Lanius collurio</i>	Red-backed Shrike	Not endemic	LC	Annex 2	Annex 1	KD
<i>Oenanthe isabellina</i>	Isabelline Wheatear	Not endemic	LC	Annex 2	Annex 1	KD
<i>Oenanthe oenanthe</i>	Northern Wheatear	Not endemic	LC	Annex 2	Annex 1	KD
<i>Alauda arvensis</i>	Eurasian Skylark	Not endemic	LC	Annex 3	Annex 1	KD
<i>Anser anser</i>	Greylag Goose	Not endemic	LC	Annex 3	Annex 1	KD
<i>Ardea cinerea</i>	Grey Heron	Not endemic	LC	Annex 3	Annex 1	KD
<i>Chroicocephalus ridibundus</i>	Black-headed Gull	Not endemic	LC	Annex 3	Annex 1	KD
<i>Emberiza calandra</i>	Corn Bunting	Not endemic	LC	Annex 3	Annex 1	KD
<i>Emberiza hortulana</i>	Ortolan Bunting	Not endemic	LC	Annex 3	Annex 1	KD
<i>Galerida cristata</i>	Crested Lark	Not endemic	LC	Annex 3	Annex 1	KD
<i>Gallinula chloropus</i>	Common Moorhen	Not endemic	LC	Annex 3	Annex 1	KD
<i>Phalacrocorax carbo</i>	Great Cormorant	Not endemic	LC	Annex 3	Annex 1	KD
<i>Rallus aquaticus</i>	Water Rail	Not endemic	LC	Annex 3	Annex 1	KD
<i>Spatula clypeata</i>	Northern Shoveler	Not endemic	LC	Annex 3	Annex 1	KD
<i>Streptopelia decaocto</i>	Eurasian Collared Dove	Not endemic	LC	Annex 3	Annex 1	KD
<i>Tringa erythropus</i>	Spotted Redshank	Not endemic	LC	Annex 3	Annex 1	KD
<i>Tringa nebularia</i>	Common Greenshank	Not endemic	LC	Annex 3	Annex 1	KD
<i>Tringa totanus</i>	Common Redshank	Not endemic	LC	Annex 3	Annex 1	KD
<i>Vanellus vanellus</i>	Northern Lapwing	Not endemic	NT	Annex 3	Annex 1	KD
<i>Larus armenicus</i>	Armenian Gull	Not endemic	LC	KD	Annex 1	KD
<i>Sturnus vulgaris</i>	Common Starling	Not endemic	LC	KD	Annex 1	KD
<i>Anas acuta</i>	Northern Pintail	Not endemic	LC	Annex 3	Annex 2	KD
<i>Anas crecca</i>	Eurasian Teal	Not endemic	LC	Annex 3	Annex 2	KD

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Anas platyrhynchos</i>	Mallard	Not endemic	LC	Annex 3	Annex 2	KD
<i>Aythya ferina</i>	Common Pochard	Not endemic	VU	Annex 3	Annex 2	KD
<i>Aythya fuligula</i>	Tufted Duck	Not endemic	LC	Annex 3	Annex 2	KD
<i>Columba livia</i>	Rock Pigeon	Not endemic	LC	Annex 3	Annex 2	KD
<i>Coturnix coturnix</i>	Common Quail	Not endemic	LC	Annex 3	Annex 2	KD
<i>Fulica atra</i>	Common Coot	Not endemic	LC	Annex 3	Annex 2	KD
<i>Gallinago gallinago</i>	Common Snipe	Not endemic	LC	Annex 3	Annex 2	KD
<i>Mareca penelope</i>	Eurasian Wigeon	Not endemic	LC	Annex 3	Annex 2	KD
<i>Mareca strepera</i>	Gadwall	Not endemic	LC	Annex 3	Annex 2	KD
<i>Spatula querquedula</i>	Garganey	Not endemic	LC	Annex 3	Annex 2	KD
<i>Corvus cornix</i>	Hooded Crow	Not endemic	LC	KD	Annex 2	KD
<i>Corvus frugilegus</i>	Rook	Not endemic	LC	KD	Annex 2	KD
<i>Corvus monedula</i>	Eurasian Jackdaw	Not endemic	LC	KD	Annex 2	KD
<i>Garrulus glandarius</i>	Eurasian Jay	Not endemic	LC	KD	Annex 2	KD
<i>Passer domesticus</i>	House Sparrow	Not endemic	LC	KD	Annex 2	KD
<i>Pica pica</i>	Magpie	Not endemic	LC	KD	Annex 2	KD
<i>Pelecanus crispus</i>	Dalmatian Pelican	Not endemic	NT	Annex 2	KD	Annex 1
<i>Accipiter nisus</i>	Eurasian Sparrowhawk	Not endemic	LC	Annex 2	KD	Annex 2
<i>Aquila chrysaetos</i>	Golden Eagle	Not endemic	LC	Annex 2	KD	Annex 2
<i>Asio otus</i>	Long-eared Owl	Not endemic	LC	Annex 2	KD	Annex 2
<i>Athene noctua</i>	Little Owl	Not endemic	LC	Annex 2	KD	Annex 2
<i>Buteo buteo</i>	Common Buzzard	Not endemic	LC	Annex 2	KD	Annex 2
<i>Buteo rufinus</i>	Long-legged Buzzard	Not endemic	LC	Annex 2	KD	Annex 2
<i>Circaetus gallicus</i>	Short-toed Snake Eagle	Not endemic	LC	Annex 2	KD	Annex 2

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Circus aeruginosus</i>	Western Marsh Harrier	Not endemic	LC	Annex 2	KD	Annex 2
<i>Circus pygargus</i>	Montagu's Harrier	Not endemic	LC	Annex 2	KD	Annex 2
<i>Falco tinnunculus</i>	Common Kestrel	Not endemic	LC	Annex 2	KD	Annex 2
<i>Oxyura leucocephala</i>	White-headed Duck	Not endemic	MOST	Annex 2	KD	Annex 2
<i>Carpodacus erythrinus</i>	Common Rosefinch	Not endemic	LC	Annex 2	KD	Annex 3
<i>Acrocephalus arundinaceus</i>	Great Reed Warbler	Not endemic	LC	Annex 2	KD	KD
<i>Acrocephalus schoenobaenus</i>	Sedge Warbler	Not endemic	LC	Annex 2	KD	KD
<i>Actitis hypoleucos</i>	Common Sandpiper	Not endemic	LC	Annex 2	KD	KD
<i>Aegypius monachus</i>	Cinereous Vulture	Not endemic	LC	Annex 2	KD	KD
<i>Anthus campestris</i>	Tawny Pipit	Not endemic	LC	Annex 2	KD	KD
<i>Aquila nipalensis</i>	Steppe Eagle	Not endemic	MOST	Annex 2	KD	KD
<i>Ardea alba</i>	Great White Egret	Not endemic	LC	Annex 2	KD	KD
<i>Ardea purpurea</i>	Purple Heron	Not endemic	LC	Annex 2	KD	KD
<i>Ardeola ralloides</i>	Squacco Heron	Not endemic	LC	Annex 2	KD	KD
<i>Calidris ferruginea</i>	Curlew Sandpiper	Not endemic	NT	Annex 2	KD	KD
<i>Cercotrichas galactotes</i>	Rufous-tailed Scrub Robin	Not endemic	LC	Annex 2	KD	KD
<i>Cettia cetti</i>	Cetti's Warbler	Not endemic	LC	Annex 2	KD	KD
<i>Chlidonias leucopterus</i>	White-winged Tern	Not endemic	LC	Annex 2	KD	KD
<i>Ciconia ciconia</i>	White Stork	Not endemic	LC	Annex 2	KD	KD
<i>Curruca communis</i>	Lesser Whitethroat	Not endemic	LC	Annex 2	KD	KD
<i>Delichon urbicum</i>	Common House Martin	Not endemic	LC	Annex 2	KD	KD
<i>Egretta garzetta</i>	Little Egret	Not endemic	LC	Annex 2	KD	KD
<i>Emberiza schoeniclus</i>	Common Reed Bunting	Not endemic	LC	Annex 2	KD	KD
<i>Eremophila alpestris</i>	Horned Lark	Not endemic	LC	Annex 2	KD	KD

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Hirundo rustica</i>	Barn Swallow	Not endemic	LC	Annex 2	KD	KD
<i>Iduna pallida</i>	Eastern Olivaceous Warbler	Not endemic	LC	Annex 2	KD	KD
<i>Lanius minor</i>	Lesser Grey Shrike	Not endemic	LC	Annex 2	KD	KD
<i>Linaria cannabina</i>	Common Linnet	Not endemic	LC	Annex 2	KD	KD
<i>Melanocorypha calandra</i>	Calandra Lark	Not endemic	LC	Annex 2	KD	KD
<i>Merops apiaster</i>	European Bee-eater	Not endemic	LC	Annex 2	KD	KD
<i>Microcarbo pygmaeus</i>	Pygmy Cormorant	Not endemic	LC	Annex 2	KD	KD
<i>Motacilla alba</i>	White Wagtail	Not endemic	LC	Annex 2	KD	KD
<i>Motacilla citreola</i>	Citrine Wagtail	Not endemic	LC	Annex 2	KD	KD
<i>Motacilla flava</i>	Yellow Wagtail	Not endemic	LC	Annex 2	KD	KD
<i>Muscicapa striata</i>	Spotted Flycatcher	Not endemic	LC	Annex 2	KD	KD
<i>Nycticorax nycticorax</i>	Black-crowned Night Heron	Not endemic	LC	Annex 2	KD	KD
<i>Pastor roseus</i>	Rosy Starling	Not endemic	LC	Annex 2	KD	KD
<i>Pelecanus onocrotalus</i>	Great White Pelican	Not endemic	LC	Annex 2	KD	KD
<i>Phoenicurus phoenicurus</i>	Common Redstart	Not endemic	LC	Annex 2	KD	KD
<i>Phoenicurus ochruros</i>	Black Redstart	Not endemic	LC	Annex 2	KD	KD
<i>Phylloscopus collybita</i>	Common Chiffchaff	Not endemic	LC	Annex 2	KD	KD
<i>Phylloscopus trochilus</i>	Willow Warbler	Not endemic	LC	Annex 2	KD	KD
<i>Podiceps grisegena</i>	Red-necked Grebe	Not endemic	LC	Annex 2	KD	KD
<i>Podiceps nigricollis</i>	Black-necked Grebe	Not endemic	LC	Annex 2	KD	KD
<i>Ptyonoprogne rupestris</i>	Eurasian Crag Martin	Not endemic	LC	Annex 2	KD	KD
<i>Riparia riparia</i>	Sand Martin	Not endemic	LC	Annex 2	KD	KD
<i>Saxicola rubetra</i>	Whinchat	Not endemic	LC	Annex 2	KD	KD
<i>Saxicola rubicola</i>	European Stonechat	Not endemic	LC	Annex 2	KD	KD

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Sitta neumayer</i>	Western Rock Nuthatch	Not endemic	LC	Annex 2	KD	KD
<i>Tachybaptus ruficollis</i>	Little Grebe	Not endemic	LC	Annex 2	KD	KD
<i>Tadorna ferruginea</i>	Ruddy Shelduck	Not endemic	LC	Annex 2	KD	KD
<i>Tringa glareola</i>	Wood Sandpiper	Not endemic	LC	Annex 2	KD	KD
<i>Tringa ochropus</i>	Green Sandpiper	Not endemic	LC	Annex 2	KD	KD
<i>Upupa epops</i>	Hoopoe	Not endemic	LC	Annex 2	KD	KD
<i>Aythya nyroca</i>	Ferruginous Duck	Not endemic	NT	Annex 3	KD	KD
<i>Podiceps cristatus</i>	Great Crested Grebe	Not endemic	LC	Annex 3	KD	KD
<i>Acrocephalus scirpaceus</i>	Eurasian Reed Warbler	Not endemic	LC	KD	KD	KD
<i>Anthus cervinus</i>	Red-throated Pipit	Not endemic	LC	KD	KD	KD
<i>Sylvia borin</i>	Garden Warbler	Not endemic	LC	KD	KD	KD

1.1.1 Çıldır dam And HEPP facility Effect in the field hydrobiological Defining Biodiversity

Fishing activities are rarely carried out in Çerçi Stream and Arpaçay. Çıldır Dam and Hydroelectric Power Plant Facility is an operational facility that produces energy by utilizing the energy of the water taken from Çıldır Lake and discharges its waters to the stream bed of Arpaçay. In this context, in terms of wetland ecosystem in the research area, there is the existence of lake and stream habitats, and these are defined as wetlands. Wetlands are basically defined by two major ecosystem types: flowing and stagnant. However, it is possible to define subsystem types according to the physical and chemical properties of water. From this perspective, while the project area streams create a freshwater (lotic) habitat, Çıldır Lake, from which the power plant waters are drawn, is considered one of the important lakes of Eastern Anatolia.

It is known that the flowing environments formed by Arpaçay are divided into smaller and repeatable habitats. While there are habitats with fast currents (rhitron), especially at the upper elevations of the basin, depending on the slope, there are also slower and stagnant (potamon) habitats in some areas. These habitat structures may change sequentially throughout the valley. However, due to the very high flow rate during the sampling period, the rate of stagnant and slow-flowing sections is quite low.

Depending on these habitat structures, there are also changes in the composition of living species. Aquatic species in fast-flowing environments and living species in stagnant environments are quite different from each other. It has fast and stagnant water habitats defined as arpaçay, rithron and potamon. However, fast current regions are less represented. It has been observed that the habitat structure with normal and relatively slow currents is more dominant. When the Eastern Anatolian lake and stream ecosystems are evaluated and the existing aquatic species are compared, it is seen that the project area streams It is not a case of sensitivity and rarity that is very different from others and unique to itself .

Table 5 : Project Area and Around belonging Alga Types

BACILLARIOPHYCEAE
<i>amphora ovalis</i>
<i>aulacoseria granulate</i>
<i>caloneis permagna</i>
<i>cocconeis placenta</i>
<i>cyclotella meneghiniana</i>
<i>Cymatopleura solea</i>
<i>Cymbella affinis</i>
<i>Cymbella cistula</i>
<i>Cymatopleura solea</i>
<i>Cymatopleura elliptica</i>
<i>diatom vulgaris</i>
<i>Diploneis ovalis</i>
<i>Epithemia Argus</i>
<i>Epithemia sorex</i>
<i>Fragilaria contruens</i>
<i>Fragilaria dilatata</i>
<i>Fragilaria ulna</i>
<i>gomphonema gracile</i>
<i>gomphonema olivaceum</i>
<i>hantzschia amphioxus</i>
<i>Navicula cryptocephala</i>
<i>Navicula cuspidata</i>
<i>Navicula radiosa</i>
<i>Nitzschia amphibia</i>
<i>Nitzschia sigmoidae</i>
<i>pinnularia viridis</i>
<i>Rhoicosphaenia abbreviata</i>
<i>surirella ovalis</i>
<i>surirella brebissonii</i>
CYANOPHYCEAE
<i>Chroococcus turgidus</i>
<i>Merismopedia glauca</i>
<i>Oscillatoira sp.</i>
<i>Oscillatoria limosa</i>
<i>spirulina sp.</i>
CHLOROPHYCEAE
<i>Closterium aciculare</i>
<i>coelastrum sp.</i>
<i>monoraphidium sp.</i>
<i>Oocystis parva</i>

Table 6: Project Area and Around belonging zooplanktonic Types

ROTIFERA
<i>brachionus calyciflorus</i>
<i>brachionus urceolaris</i>
<i>keratella quadrata</i>
<i>cephalodella gibba</i>
<i>polyarthra vulgaris</i>
<i>Lecane lunaris</i>
CLADOCERA
<i>Leptodora kindti</i>
<i>daphnia breadsticks</i>
<i>Chydorus sphaericus</i>
<i>Alona rectangular</i>
IN COPEPO
<i>Acanthodiaptomus denticornis</i>
<i>Eucyclops serrulatus</i>

Table 7: Project Area and Around belonging benthic organisms

Branch: MOLLUSIAN
Class: GASTROPODA
Set: PULMONATA
Family: Planorbidae
<i>gyraulus albus</i> Müller
Family: Ancyliidae
<i>Ancylus fluviatilis</i> Müller
Branch: ARTHROPODA
Class: CRUSTACEA
Set: AMPHIPODA
Family: Gammaridae
<i>gammarus pulex</i> L.
Class: INSECTA
Set: EPHEMEROPTERA
Family: Baetidae
<i>Baetis rhodani</i> Pict .
Family: Oligoneuriidae
<i>oligoneuriella orontensis</i> Koch
Family: heptageniidae
<i>Ecdyonurus autumnalis</i> braasch
<i>iron alpestris</i> braasch
Family: Ephemerellidae
<i>ephemerella ignita</i> poda
Set: PLECOPTERA
Family: nemouridae
<i>nemoura</i> sp.
Family: perlidae
<i>perla marginate</i> Sun.
Set: COLEOPTERA
Family: Elmidae
<i>Elmis</i> sp.

<i>Limnius sp</i>
Set: TRICHOPTERA
Family: Rhyacophilidae
<i>rhyacophila sp.</i>
Family: psychomyidae
<i>psychomyia compass Fbr .</i>
Set: DIPTERA
Family: Blephariceridae
<i>liponeura sp.</i>
Family: Limoniidae
<i>dicranota sp.</i>
<i>Eriocera sp.</i>

Table 8 : Project in the field Found Fish Types and Protection Status

Family	Type And subspecies	Turkish First Name	endemism	BERN	IUCN	CITES	Natural Type	Exotic Genre
Cyprinidae	<i>acanthalburnus microlepis</i>	Pearl fish	-	-	WHA T	-	X	-
	<i>alburnoides eichwaldii</i>	Dotted pearl fish	-	-	WHA T	-	X	-
	<i>Alburnus filippii</i>	Pearl fish	-	-	LC	-	X	-
	<i>barbus lacerta</i> (HECKEL, 1843)	moustachioed fish	-	ANNE X III	LC	-	X	-
	<i>cyprinus carpio</i>	Carp	-	-	VU	-	X	-
	<i>Luciobarbus mursa</i>	Murzu	-	-	LC	-	X	-
	<i>Luciobarbus capito</i>	Caner, moustachioed fish	-	-	VU	-	X	-
	<i>Capoeta capoeta</i>	Syraz, Stupid fish	-	-	LC	-	X	-
	<i>Romanogobio persus</i>	Stream rock	-	-	WHA T	-	X	-
	<i>chondrostoma cyri</i>	Karaburun	-		LC		X	-
	<i>Squalius cephalus</i> (L., 1758)	Freshwater mullet	-		LC		X	-
Balitoridae	<i>Oxynoemacheilus angorae</i>	Scavenger Fish	-		LC		X	-

1.6 Biodiversity Risk Evaluation

1.6.3 Flora

Considering the IFC PS-6 and Guidance Note 6 criteria for the Project Area and Environment, there are no plant taxa with CR and EN status within the scope of the IUCN convention, and since there are no plant taxa within the scope of the Bern and CITES conventions, there is no critical habitat in terms of species conservation.

1.6.3.1 Invasive Species

Alien invasive species, either accidentally or intentionally, move beyond their natural geographic range and become problematic. They often arise due to the globalization of the economy through the movement of people and goods, such as ship transportation, shipments of wood products, consignments carrying insects, or transportation of ornamental plants to new regions. The EU developed *Regulation (EU) 1143/2014* to actively deal with alien invasive species.

Alien invasive species (IAS) can cause serious ecological impacts on invaded environments. They may lack natural predators in their new environment, allowing them to increase their abundance and spread rapidly. They can carry diseases, compete with or prey on native species, alter food chains, and even alter ecosystems, for example by altering soil composition or creating habitats that encourage wildfires. These impacts can lead to local or global extinction of native species and ultimately ecological destruction.

IAS can also have significant socio-economic impacts. The European Union (EU) faces losses worth EUR 12 billion annually due to the effects of IAS on human health, infrastructure damage and agricultural damage.

There are more than 12,000 alien species in Europe, 15% of which are invasive. IAS, European threat It is the third most serious threat to the species below. According to a report published in 2015, 354 endangered species (229 animals, 124 plants and 1 fungus) are among all threatened species in Europe. It is clearly affected by IAS, accounting for 19% of the species under it. The newly adopted EU Biodiversity Strategy highlights the importance of tackling this threat by proposing to manage established alien invasive species and reduce the number of Red List species they threaten by 50% by 2030.





In 2013, the European Commission (EC) put forward a proposed law within the framework of an EU Directive on IAS, providing for prevention of their introduction, early warning/rapid response and effective and coordinated management. topics forward It lasted. IUCN, WHITE with made One soap opera service contract And In collaboration with the IUCN Invasive Species Expert Group (ITUG), it has been providing technical and scientific support to the implementation of the EU IAS Regulation since 2016.





Invasive flora species have been detected in the impact area of the project (*Ailanthus altissima* Table 9). The Biodiversity Action Plan must be followed.

Energy investment areas are areas shaped by human influence. Construction activities arising from the nature of the investment in these areas have been tried to be rehabilitated through landscape planning around the roads and buildings. The ability of some plant species used here to survive and spread in the area causes them to be called invasive species. Apart from rehabilitation studies, species carried by floods or faunistic sources may also have the same nature. For these reasons, to preserve the existence of the natural areas within the energy investment area, the individuals and diaspores (reproductive units) of these plants must be cleared from the area.

Timing: Controlling invasive plant species should be done before the plant goes to seed. If the plant is known for its above-ground parts before flowering, the removal is done in the spring; otherwise, it is removed immediately after flowering.

Table 9: Project in the field Found and Finding Likely Invader Species

<p><i>Acer negundo</i> (Ash-leaved maple) Areas susceptible to andropogenic influence</p>	
<p><i>agropyron repens</i> (Separate herb) Field, open area</p>	
<p><i>Ailanthus altissima</i> (Kokarağaç) Areas open to andropogenic influence</p>	
<p><i>amaranthus retroflexus</i> (Fox dry) Field, open area</p>	

<p><i>Boreava orientalis</i> (Sariot) Field, roadside</p>	
<p><i>chenopodium album</i> (Sneezing) Flood, flood bearings</p>	
<p><i>Cirsium arvense</i> (Köygöçüren) Flood, flood bearings</p>	
<p><i>conyza canadensis</i> (cypress) andropogenic to the effect open spaces</p>	

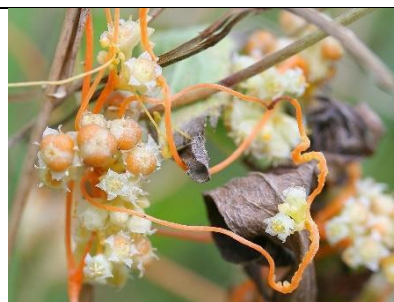
conyza bonariensis (Coyote) andropogenic to the effect
open spaces










conyza albida (maplewort) andropogenic to the effect
open fields







Cuscuta campestris (Turkish) meadow-pasture habitats



<p><i>Lepidium draba</i> (Dičnik) andropogenic to the effect open fields</p>	
<p><i>nasturtium officinale</i> (Suteresi) Stream edge</p>	
<p><i>Reseda lutea</i> (Love flower) Path edge, field</p>	
<p><i>Rumex acetosella</i> (Sorrel) Roadside, fields and barren places</p>	

<p><i>Senecio vernalis</i> (Canary herb) Path edge And Areas shaped by human influence</p>	
<p><i>Sicyos angulatus</i> (Itdolanbacı) Damp fields</p>	
<p><i>Solanum americanum</i> (Push grape) This edge and damp shady places</p>	
<p><i>portulaca oleracea</i> (Purslane) Field, open area</p>	
<p><i>Phytolacca americana</i> (Candymaker's paint) Stream beds and moist habitats</p>	

<p><i>Paspalum distichum</i> (This discrete) This communities in channels</p>		
<p><i>Robinia pseudoacacia</i> (White-flowered false acacia) Roadsides</p>		
<p><i>Xanthium strumarium</i> (Big Pitarak) Flood, flood bearings</p>		
<p><i>Xanthium spinosum</i> (Yellow Pitarak) Flood, flood bearings</p>		

Viscum album (Lime herb) to the tree's interference



1.6.4 Fauna

Considering IFC PS-6 and Guidance Note 6 criteria, the "critical species" evaluation and "critical habitat" evaluation were made in chapter 5, and there are no Critical species in terms of fauna (Amphibia, Reptile, Mammal) in the region, and accordingly, critical habitat There is no.

Risk Assessment for Tortoise (*Testudo graeca*): This species has been seen around the area. Its presence in the region has been assessed sparsely. Since it is not a water-dependent species, it has been evaluated that the facility does not have a negative impact on this species. However, it would be useful to raise awareness about the species and take some precautions to prevent harm to the species, especially in human-tortoise encounters. These issues are detailed in the Biodiversity Action Plan.

Risk Assessment for Lynx (*Lynx lynx*) : The habitat of the project area and its surroundings seems very suitable for this species. It is difficult to be seen by humans because it prefers to stay away from humans and is very well camouflaged. Negative feedback from a HEPP facility due to the animal's lifestyle to be affected much possible It is not visible. However, type about your awareness It would be useful to increase the number of species and take some precautions to prevent harm to the species, especially in human-lynx encounters. These issues are detailed in the Biodiversity Action Plan.

Risk assessment for otter (*Lutra lutra*) : Its presence in the project area has been confirmed by project staff. It is stated that it is located in the stream area after the power plant. They are also likely to use Çıldır Lake. No threat to the species has been observed. These issues are detailed in the Biodiversity Action Plan.

Risk Assessment for Little Viper (*Vipera eriwanensis*) : Although this species has not been seen directly around the area, it is a species that is distributed throughout the region. No negative impact on this species is anticipated during the operation phase of the project. However, it would be useful to raise awareness about the species and take some precautions to prevent harm to the species and people, especially in human-snake encounters. These issues are detailed in the Biodiversity Action Plan.

The area around the power plant is fenced with barbed wire. Barbed wire carries the risk of injuring wild animals due to its barbs, and since it is in a very rusty state, it carries the risk of transmitting germs to animals in case of possible injuries.

Enough water comes from the Cansuyu stream in the power plant area. However, when we look at the starting point on the GI shore, which is the release point of the life water pipe, very little water is released from the life water pipe. So much so that there is no surface water flow at most points in the approximately 200 streams in the starting area. In this state, aquatic vertebrates (water snakes, water frogs, salamanders, etc.) that have to move in water do not have the chance to reach the lake by moving along the stream. Due to the fill filled in the stream bed during the construction of the railway between the cansusu release point from Çıldır lake and the culvert under the railway crossing located 100 m below, the water flow in the stream seems to have sunk under the fill. This situation negatively affects the animal life in the stream. This It seems necessary to clean the fill in the area and ensure uninterrupted surface water flow in the stream bed.

1.6.5 Ornithology

Considering the IFC PS-6 and Guidance Note 6 criteria, the "critical species" evaluation and "critical habitat" evaluation were made in section 5, and there are Critical species in terms of birds in the region. These species are the Applehead Pochard (*Aythya ferina*), the Hornbill (*Oxyura leucocephala*) and the Steppe Eagle (*Aquila nipalensis*). Attention should be paid to the actions provided in the Biodiversity Action Plan for the species in question.

1.6.6 Hydrobiology

Aquatic species; Characteristic biocoenoses are formed by adapting to the living conditions in a particular river section and by changing abiotic factors along the stream. brings (Vannote et al. 1980). Algae, zooplankton and benthic organisms living in the stream environment can also create new communities within this biocenosis and create significant changes, especially in the food pyramid. More productive stagnant water environments can constitute important food areas for all aquatic creatures.

An invasive algae, zooplankton, benthic organism or fish in Çıldır HEPP and surrounding areas species has not been found. Social responsibility projects and biodiversity action plans are important at this point.

Ensuring the continuity of the river is vital for the survival of some species and the maintenance of genetic diversity.

Dam areas in the river system undergo genetic isolation, and gene diversity in the same species narrows. Population dynamics become more sensitive.

Sustaining the migration cycle and extinction of species is possible by functionally constructing and operating fish passages.

Cansuyu start from Çıldır HEPP regulator area The amount given from the point is too much little However, surface water flow is not provided. The railway crosses the stream about 100 meters below the Cansuyu starting point. While the railway was being built, some ground filling was done in the stream. When the filling is stony and loose material, the water sinks here. It is necessary to clean the embankment and ensure uninterrupted superficial water flow in the stream bed .

1.6.7 Environmental Risk Analysis

The project is not likely to adversely affect human health or the environment, directly or indirectly. Environmental Risk It is called. Estimating the magnitude of risk in all its activities and Deciding whether the risk can be tolerated is called **Risk Assessment**.

Environmental Risk Assessment, Appropriate methods are used to identify environmental hazards in the working environment, reveal risks and control risks through systematic methods. qualitative and/or It is a set of studies conducted using quantitative methods.

In order to determine the environmental impacts that are likely to occur in the periods determined within the scope of the environmental management and monitoring plan and to minimize the impacts of the project by collecting the relevant data and comparing the compliance of the studies carried out with the legislation ;

- of the business management,
- wastes,
- air emissions,
- noisy,
- wastewater,

like effects will be monitored.

A Waste Management Plan must be prepared for the wastes generated and likely to be generated within the scope of the project, and it is necessary to continue to act in accordance with the issues specified in the waste plan and the applicable legislation at all stages of the project. Waste Management that should be implemented within the scope of the project is given in Table 10 .

Table 10 Implementation Required Waste Management

STAGE	SUBJECT		PRECAUTION
BUILDING AND BUSINESS PHASE	Noisy And Vibration		During the operation phase of the project, noise generation will arise from vehicles. However, still operating owner by activity any One negative of the effect absence for the purpose of All necessary security measures must be taken and any complaints or suggestions from nearby settlements must be taken into consideration and necessary action must be taken by the activity owner.
	Weather emissions	Vehicle Welding	The vehicles used in the project area were published in the Official Gazette dated 11.03.2017 and numbered 30004. into force entering "Exhaust gas emission Control Regulation with Gasoline And Diesel quality "Regulation" to the provisions to be complied with is required.
	Waste Management	domestic Qualified Thick Wastes	Project in the scope of formed domestic qualified thick wastes smell, insect And negative to the effects It must be collected in sealed containers.
		PACKAGING waste	domestic qualified thick of waste management for 02.04.2015 history And 29314 numbered Official Newspaper' It is necessary to comply with the provisions of the "Waste Management Regulation", which was published and entered into force . Back gain possible non- organic origin domestic qualified thick wastes whereas mouth It should be collected in closed domestic waste bins and delivered to the relevant Municipality. Recyclable wastes (glass, paper/cardboard, metal, etc.) must be collected separately from other wastes, deposited in containers, and recycled by companies licensed by the Ministry of Environment, Urbanization and Climate Change. dated 202021 on the subject and 31523 numbered Official Newspaper' also by publishing into force entering PACKAGING of waste The provisions of the Control Regulation must be complied with. of waste is accumulated containers continually aspect closed by keeping rodent animal And Pest prevention must be ensured.
		domestic Qualified Waste water	Business in the phase formed wastewater in the scope of 31.12.2004 History And 25687 Numbered In the Official Gazette by publishing into force entering "This pollution Control "Regulation" provisions must be complied with. Business during This pollution Control Regulation, Drinking-Use juice The provisions of the Regulation on the Protection of Basins must be complied with. of the project all in stages 23.12.1960 date and 10688 numbered Official Newspaper' also published "Law on Groundwater No. 167" and "On the Protection of Groundwater Against Pollution and Deterioration" published in the Official Gazette No. 28257 dated 07.04.2012 Regulation" to the provisions respect to be is required.

STAGE	SUBJECT		PRECAUTION
		Waste Battery And Accumulators	<p>process in the scope of formed waste battery And accumulators in the scope of, Waste Battery And In accordance with Article 13 of the Accumulator Control Regulation;</p> <p>By collecting waste batteries separately from household waste, businesses that distribute and sell battery products or by municipalities will be created collection to the points waste batteries delivery After becoming waste, the resulting cells, accumulators and/or accumulators used in transformers should not be kept on a sealed surface within the site for more than ninety days until they are delivered to the manufacturer.</p> <p>31.08.2004 history And 25569 numbered Official in the newspaper by publishing into force entering "Waste Battery It is necessary to ensure that waste is disposed of in accordance with the provisions of the "Regulation on the Control of Batteries and Accumulators".</p>
		Medical Wastes	<p>For medical waste generated within the scope of the activity; waste at the source -most member will download system establishment</p> <p>of waste separate collection, moving And temporary storage with One accident instantly Preparing and complying with an in-unit industrial waste management plan that includes the measures to be taken. Collecting medical, hazardous and domestic wastes and packaging waste separately at the source without mixing with each other,</p> <p>Medical wastes with cutting-piercing waste while collecting technical features In the regulation using specified bags and containers, Separate collected medical And domestic qualified waste Only This work for allocation has been Vehicles with separate transported separately waste temporary to store for the purpose of temporary waste warehouse construction will be or It is required to have a container, Legislation to the provisions to be complied with is required.</p>
		Waste Electronic Things	<p>It is possible that electronic waste will be generated during the process. The electronic waste generated is temporary waste storage on the forehead by accumulating licensed disposal/return earnings to the company must be given. Compliance with the provisions of the Regulation on the Control of Waste Electrical and Electronic Equipment, which came into force after being published in the Official Gazette dated 22.05.2012 and numbered 28300.to be is required.</p>
		Waste oils	<p>Within the scope of waste oils generated at all stages of the project, the "Waste Oils Management Regulation", which came into force after being published in the Official Gazette dated 21.12.2019 and numbered 30985, and the "Waste Management Regulation", which came into force after being published in the Official Gazette dated 02.04.2015 and numbered 29314. "Regulation" to the provisions respect to be is required. Formed waste oils Temporary</p>

STAGE	SUBJECT		PRECAUTION
			It is stored in the Waste Storage Area and collected by the Ministry of Environment, Urbanization and Climate Change. licence given by companies back gain and/or disposal ensuring is required
		Waste Vegetable Waste oils	of the project vegetable waste oil formation in case 002015 history And 29378 numbered Official It is necessary to comply with the relevant provisions of the "Regulation on the Control of Waste Vegetable Oils", which came into force after being published in the Gazette.
		of your life Completed Tires	Any One for this reason promise subject of waste welding in case your life expired tires, dated 25.11.2006 and numbered 26357 "Control of End-of-Life Tires" Regulation”) to the provisions respect to be is required.
		Dangerous Wastes	In case of fluorescent lamps used in lighting, printing toners from printers used in the administrative building, contaminated waste and other hazardous wastes at any stage of the process, they will be stored in the Temporary Waste Storage Area in accordance with waste codes. Environment urbanism And Climate change ministry by licence given by companies back gain and/or disposal ensuring is required
		Oily Mud mud	of the process any One in the phase or equipment care from his work caused Oily sludges must be sent to licensed companies and disposed of.

The relevant applications within the scope of the Regulation on Amendments to the Zero Waste Regulation of the facility have been completed and it has a zero waste certificate. Waste Management Regulation of the Facility in the scope of prepared Industrial Waste Management plan is available is, It has been determined that it has been approved by the Provincial Directorate of Environment, Urbanization and Climate Change. It has been determined that the packaging waste generated in the facility is separated on site in accordance with its codes and is regularly stored in the Temporary Waste Storage Area. The stored waste is recycled through licensed companies.

It has been determined that waste scrap materials are stored on soil ground in some areas of the facility, and care should be taken to store scrap materials on concrete floors.

Domestic wastewater generated within the scope of the project is collected in the septic tank, and it has been determined that it is disposed of by using a sewage truck service.

However, it was observed that the project was outside the scope of the Environmental Permit and License Regulation. However, it has been determined that no application has been made under the Environmental Permit and License Regulation. Applications must be made urgently for the facility in question within the scope of the Environmental Permit and License Regulation.

1.7 biodiversity Action plan

go crazy dam And HEPP facility facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
LO1	All Habitats	Critical Conservation of Fauna Species	General Area	Endangered Fauna types Research in particular upright tail (Oxyura Leucocephala) and Steppe Eagle (<i>Aquila Nipalensis</i>) Species in the Project Area and Surroundings It should be investigated	Species/Population by Expert Biologists Level Monitoring	During Operation	2 Year Duration: March-November Between
LO2	Business	Fauna Conservation of Species	Project Area And surroundings	Facility Employees Should Be Provided Training About the Tortoise (<i>Testudo Graeca</i>) Species. Pay Attention to Certain Points of the Project Area Tortoise “It may come out.” Signs Should Be Placed.	Biologists who are experts on the subject Training Should Be Provided by	During Operation	April-May 2024 one Times
LO3	All Habitats	Fauna Conservation of Species	Project Area And surroundings	Otter (<i>Lutra Lutra</i>) Species in the Project Area and Surroundings It should be investigated And Education It should be given.	Species/Population by Expert Biologists At the level Tracing	During Operation	2024 Year September Bear 1 Time
LO4	All Habitats	Fauna Conservation of Species	Project Area And surroundings	Big Viper (<i>Macrovipera Lebetina</i>) And Small Viper (<i>Vipera Eriwanensis</i>) Awareness Raising About Types Education It should be given.	Species/Population by Expert Biologists Level Monitoring	During Operation	2023 May

LO5	Business	Fauna Conservation of Species	Project Area And surroundin gs	Lynx (<i>lynx lynx</i>) Type About Facility Employees Should Be Provided Training	subject professional biologists Training Should Be Provided by	During Operatio n	April-May 2024
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go crazy dam And HEPP facility facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
LO6	Business	Fauna Conservation of Species	Project Area And surroundings	Pet Cats Should Never Be Kepted in the Facility. Although it is recommended not to have a pet dog, Even Especially at Night Free to their wanderings Permission should not be given	Company By	During Operation	April-May 2024
LO7	Business	Fauna Conservation of Species	Project Area And surroundings	In order to prevent tortoises and other animals from being crushed by vehicles while crossing the roads, vehicle speeds should be limited to 30 km/h within the facility. With Limitation, Transition your priority Each Time to animals It must be given .	Company By	During Operation	Continually

LO8	Business	Fauna Conservation of Species	Project Area And surroundin gs	<p>in the region Bear (<i>Ursus Arctos</i>) is available. Human-Bear Encounters Can Sometimes Be Dangerous.</p> <p>bears To the region Garbage containing food should never be left open in the facility to avoid shrinkage. A Garbage Management plan How to Store Garbage That May Attract Bears and How to Store It was removed from About Application It must be reported.</p>	Company By	During Operatio n	Continually
LO9	All	Invader species	Project Area	Project Area, Around	subject professional	Business	one Year while

go crazy dam And HEPP facility facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
	habitats	blocking	And surroundings	Found And Especially <i>Ailanthus Altissima</i> Invasive Species Investigating Dismantling Plan by Monitoring in the Project Area and Surroundings It must be prepared.	Species/Population by Biologists Level Monitoring	During	In July and August
S10	Business	Fish Conservation of Species	Cansuyu Drop Off Point	Due to the fill filled in the stream bed during the railway construction between the culvert under the railway crossing, the water flow in the stream appears to be submerged under the fill. Cleaning the Filling in This Area And Stream Visible Water Flow Must Be Provided Inside. This with purpose Stream Intra Filling Must Be Cleaned And The amount of life water should be increased.	In the Coordination of Biologists Expert on the Subject By Company	During Operation	2023 February y March

LO11	Business	Fish Conservation of Species	Project Area	Some Fish Species Have Long Distance and Some Have Short Distance Migration They are the species that can . Particularly Gene Diversity of Fish It is important to make a fish passage to prevent it from narrowing.	In the Coordination of Biologists Expert on the Subject By Company	During Operation	2023 May-August
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go crazy dam And HEPP facility facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
Q12	Business	Prevention of Environmental Pollution	Project Area	Licensed in accordance with the Waste Codes for Hazardous Wastes Generated within the Business Companies Delivery to Recycling/Disposal Facilities by It should be done.	Company By	During Operation	6 on the moon one
S13	Business	Prevention of Environmental Pollution	Project Area	Licensed in accordance with the Waste Codes for Non-Hazardous Wastes Generated within the Business Companies Delivery to Recycling/Disposal Facilities by It should be done.	Company By	During Operation	per year one
Q14	Business	Prevention of Environmental Pollution	Project Area	domestic wastewater Towing with a Sewage Truck	Company by	During Operation	septic tank 80% When You Reach Your Level
Q15	Business	Regulatory Compliance	Project Area	Obtaining Environmental Permit Exemption It is necessary.	Company by	During Operation	2022 December

PROJECT TEAM

Name- Surname/Title	In Report/Study Department He is Assigned to	Sign ature
<i>Specialist Biologist Tariq BATUHAN</i>	Project And Report Coordination Ecological Assessment	
<i>Prof. Dr. Mustafa SÖZEN</i>	Fauna Evaluation	
<i>Prof. Dr. Tahir SHOOTER</i>	hydrobiological Evaluation	
<i>Dr. Lecturer Member of Karim SOUTH</i>	Flora And Vegetation Evaluation	
<i>Kaan ÖZGENCİL</i>	Ornithological Evaluation And GIS Studies	
<i>Biologist Mehmet Ali YUKSEL</i>	Ecological Studies And Land Coordination	
<i>Experienced Bird Observer Ayhan BATUHAN</i>	Bird observation	

