

MERCAN REGULATOR AND HEPP OPERATION BIODIVERSITY ACTION PLAN

1.1 Entrance

Mercan Hydroelectric Power Plant (HEPP), operated by Zorlu Doğal Elektrik Üretimi A.Ş., is located in Tunceli province, in the Upper Euphrates Basin of the Eastern Anatolia Region, and was established on the Mercan Stream. The province, which lies entirely within the Euphrates Basin, is a high region surrounded by natural borders. The extensions of the Eastern Taurus Mountains extend in the east-west direction, covering almost the entire northwest, north, and northeast of the province. Mercan HEPP is approximately 13 km from Ovacık District and approximately 71 km from Tunceli Province.

Mercan HEPP receives the necessary water from Mercan Stream. The water taken from the regulator is transmitted to the loading pool through a closed channel with a cross-section of 4 x 4 m and a length of 14 km. The elevation of the loading pool is 1497.67 m, and the outlet water elevation is 1293.25 meters. The water in the loading pool is conveyed to the turbines through a penstock pipe with a length of 400 m, a diameter of 1.5 m, and a thickness of approximately 25 mm, which is divided into three branches at the entrance of the power plant.

The construction works of Mercan HEPP, which started in 1985, were completed in 2003. It was put into operation on 08.10.2003 with the completion of the electromechanical equipment installation and has been in operation since 2003.

After it was put into operation, it was operated under the Keban Operation Directorate, which was transferred to Elektrik Üretim A.Ş. (EÜAŞ) by the General Directorate of DSI. It was included in the scope of privatization by the Privatization High Council with its decision numbered 2006/100 on 27.12.2006. On 30 June 2007, the operating rights were transferred to Ankara Doğal Elektrik Üretimi A.Ş. (ADÜAŞ) and as a result of the tender held with the decision of the Privatization High Council dated 07.05.2008 and numbered 2008/29, the operating rights were transferred to Zorlu Doğal Elektrik Üretimi A.Ş. on 01.09.2008 for 30 years.

From a bird's eye view of the project area, the village of Şahverdi is approximately 0.9 km away. Approximately, Havuzlu village is 2.9 km away, Gözeler village is 5 km away, Köseler village is 11.2 km away, Paşadüzü village is 9.8 km away, Ovacık village is 8.8 km away, Konaklar village is 8.8 km away, Sarıtosun village is 8.3 km away, Güneykonak village is 6.9 km away, Yaylargünü village is 7.8 km away, Yoncalı village is 10 km away, Çayüstü village is 8.9 km away, Akyayık village is 3.7 km away, and Öveçler village is 9.8 km away (Figure 5-6).

Around the project area, there are significant water bodies that may attract birds, with the Munzur River being 6.9 km away as the crow flies (Figure 7-9).



Figure 1: Satellite Image of Mercan HEPP Project Area



Figure 2: Satellite Image of Mercan HEPP Project Area

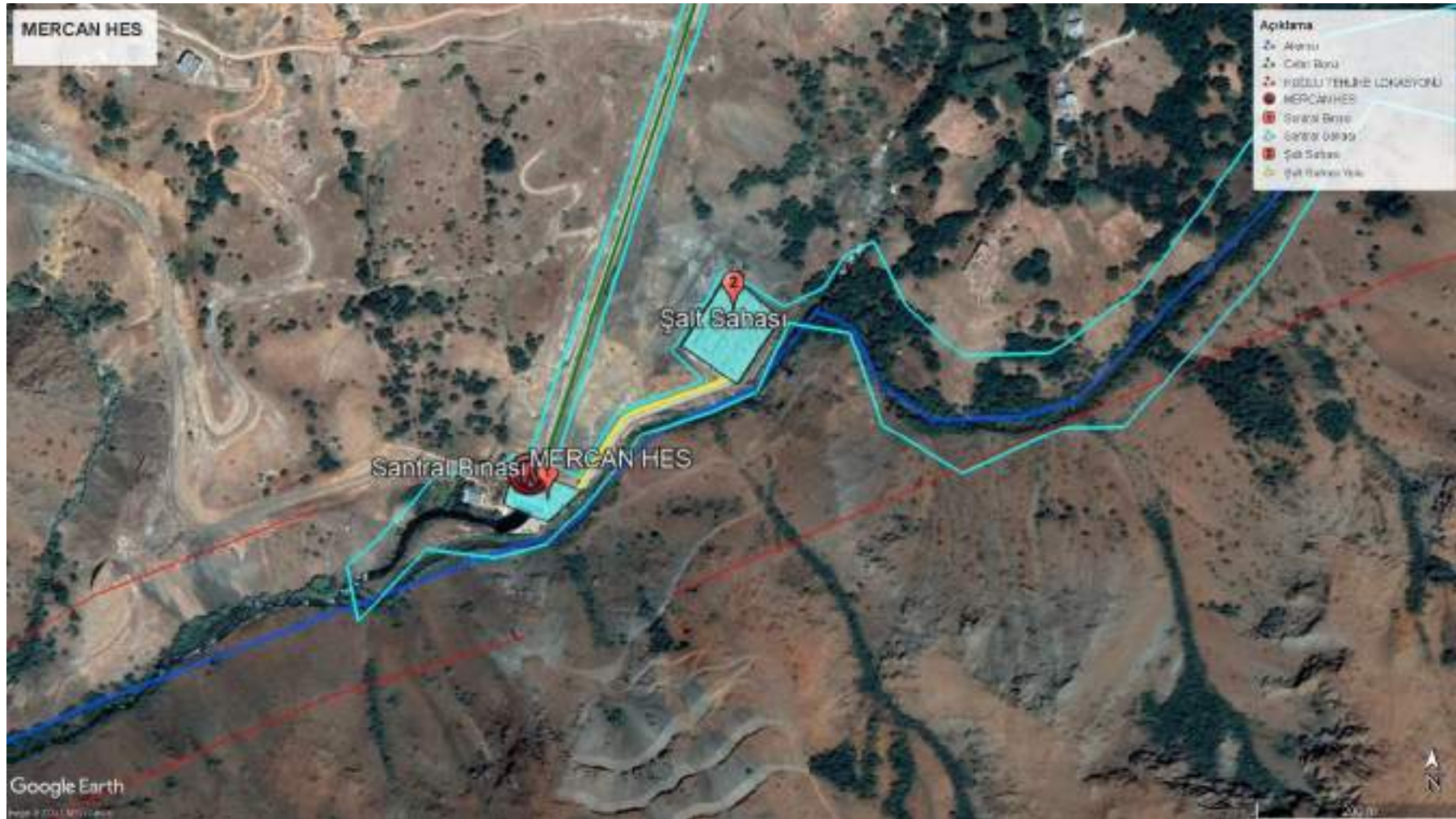


Figure 3: Satellite Image of Mercan HEPP Project Area



Figure 4: Satellite Image of Mercan HEPP Project Area

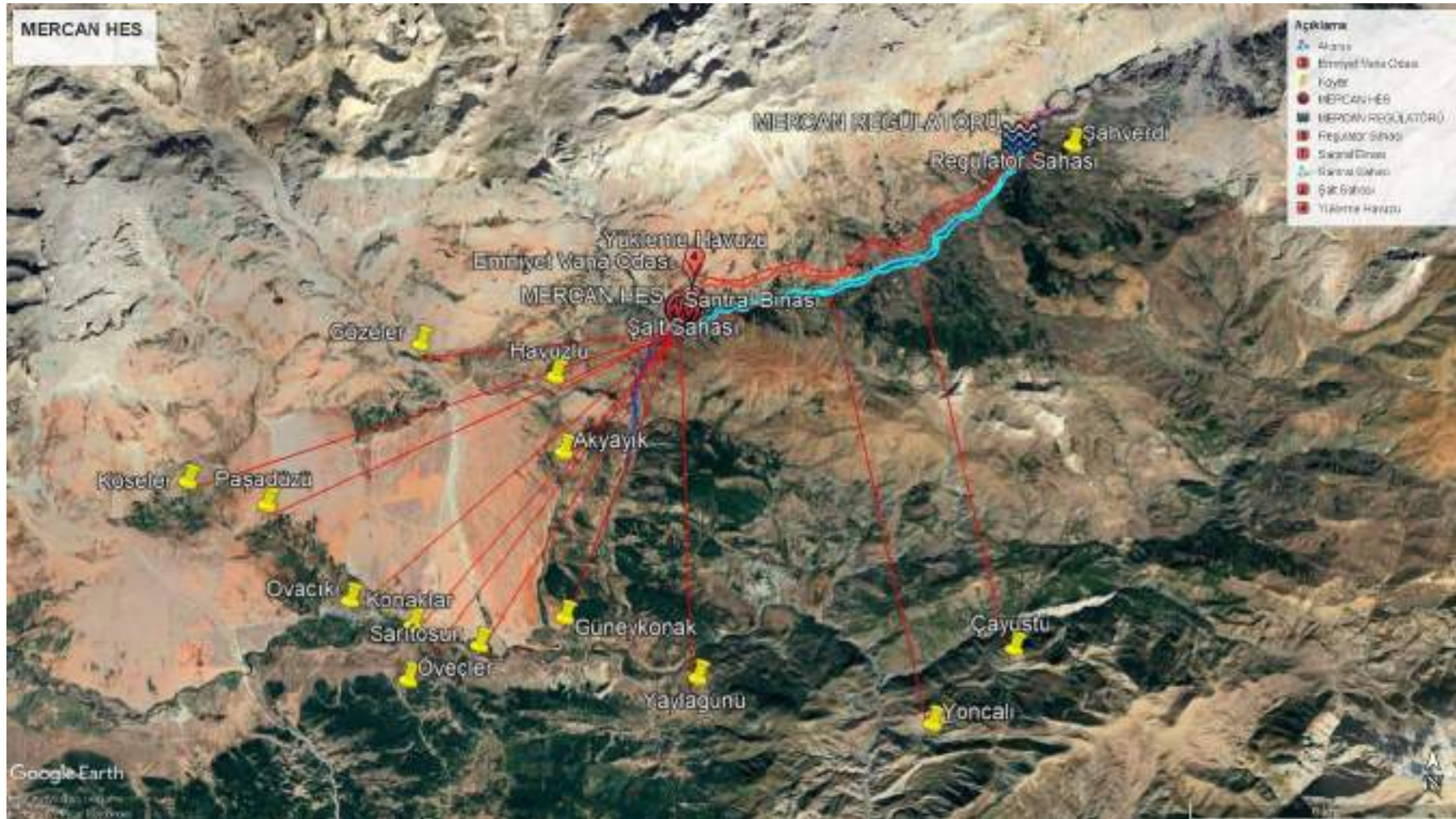


Figure 5: Settlements (Village/Neighborhood) Close to the Project Area



Figure 6: Distance of the Project Area to Important Centers



Figure 7: Important Water Bodies Around the Project



Figure 8: Important Water Bodies Around the Project



Figure 9: Important Water Bodies Around the Project

1.2 Relationship of the Area with Protected and Special Status Areas

The Mercan HEPP site is located within the Munzur Valley National Park (MP). Additionally, from a bird's eye view, Esen Tepe Nature Park is approximately 35.2 km away from the project site, and Ekşisu Sazlığı Important Nature Area is 30 km away. Moreover, the project area falls within the Munzur Mountains Important Nature Area (Figures 10-12).

Munzur Valley National Park

Munzur Valley National Park is one of the exceptional corners of our country, rich in natural data including river sources, springs, endemic plant species, local animal species, rich vegetation, and the existence of wild animals.

The rare trout species indigenous to the region are commonly and abundantly found in the Munzur and Mercan rivers. Additionally, the two types of mountain goats, known as the mountain goat and the hooked horned mountain goat, along with game birds, represent the unique values of wildlife in the area.

Crater lakes on peaks approaching 3000 meters in the Munzur Mountains, springs, canyons in the Ovacık district plain, and waterfalls flowing throughout the valley enrich the natural values of the park. The Kırk Merdiven Waterfalls, located on the slopes of the Munzur Mountains descending into Mercan Valley, consist of a series of waterfalls flowing in a narrow, small valley. With its abundant water, natural environment, and landscape features, Kırk Merdiven Waterfalls offer an interesting and attractive visual richness, being one of the first stopping places on the route to the plateaus north of Ovacık.

Located at an altitude of 1636 meters northwest of Şahverdi village in the north of Munzur Valley National Park, the site ruins of Kale Tepe Locality have been registered as a 1st Degree Archaeological Site by the Ministry of Culture and Tourism, Erzurum Cultural and Natural Heritage Preservation Board. Additionally, the Tülin Tepe, Tepecik, and Pulur mounds near the borders of Munzur Valley National Park are important historical sites that indicate the presence of settlements during the Chalcolithic and Neolithic periods.

The unique natural view and all wildlife can be easily viewed in every corner of the national park. 1518 various plants have been identified in the flora of Munzur Valley National Park, which is very rich in terms of vegetation, of which 43 species are endemic to the Munzur Mountains and 227 species are endemic to Turkey.

The dominant tree species in the national park are oaks and various species. Rocky hills and slopes where there are none are covered with oak forests. There is a rich vegetation consisting of mixed elm, maple, ash, plane, vine, birch, walnut, wild hazelnut, poplar, willow, and shrub species on the valley floor and along the waterways.

There are wolves, foxes, martens, bears, lynx, otters, badgers, squirrels, rabbits, wild boars, and wild goats in the National Park. The brown bear, which lives in caves and rock cavities, is one of the important large mammals of Munzur wildlife

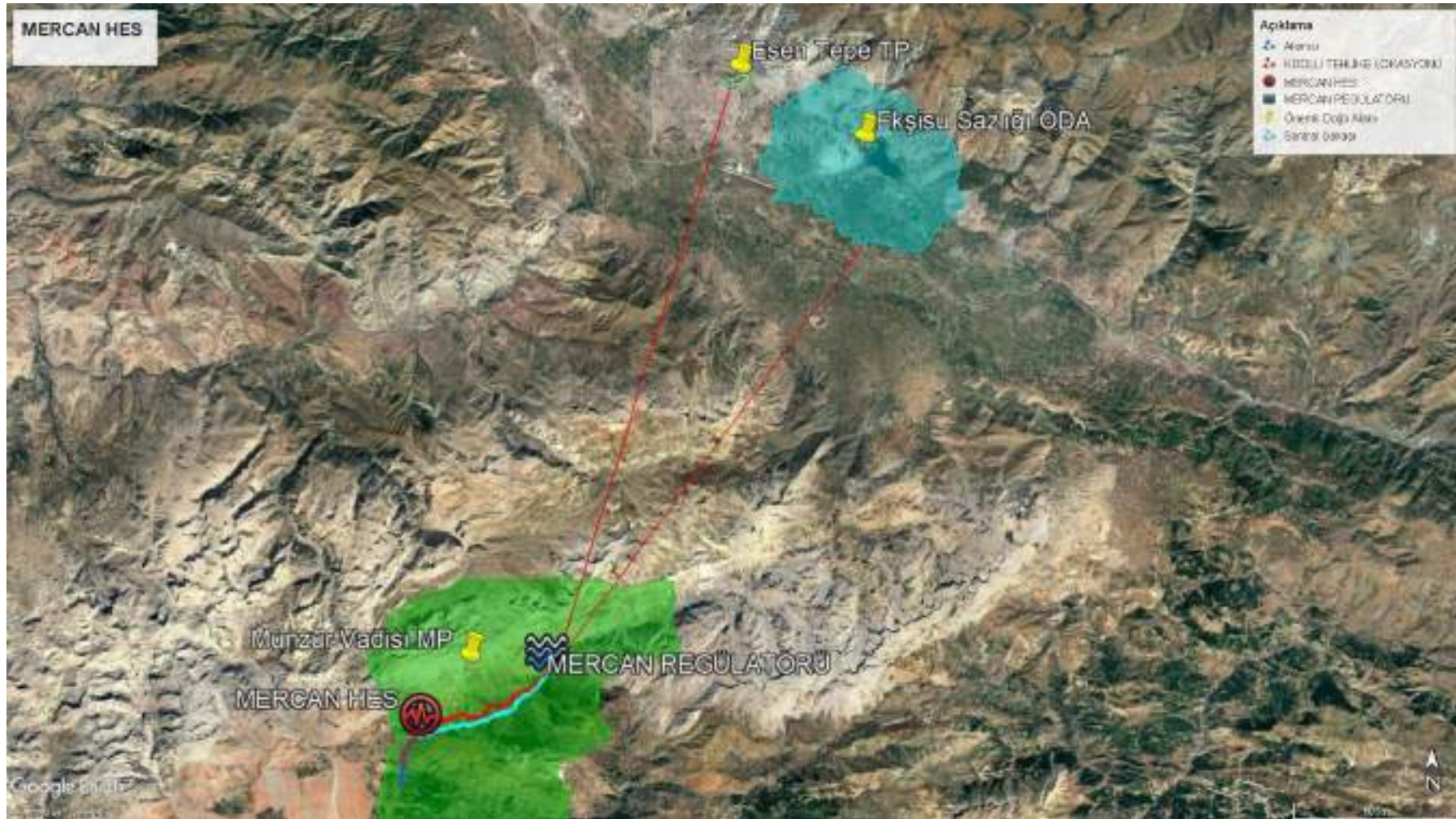


Figure 10: Satellite Image Showing the Relationship Between the Project Site and Protected Areas

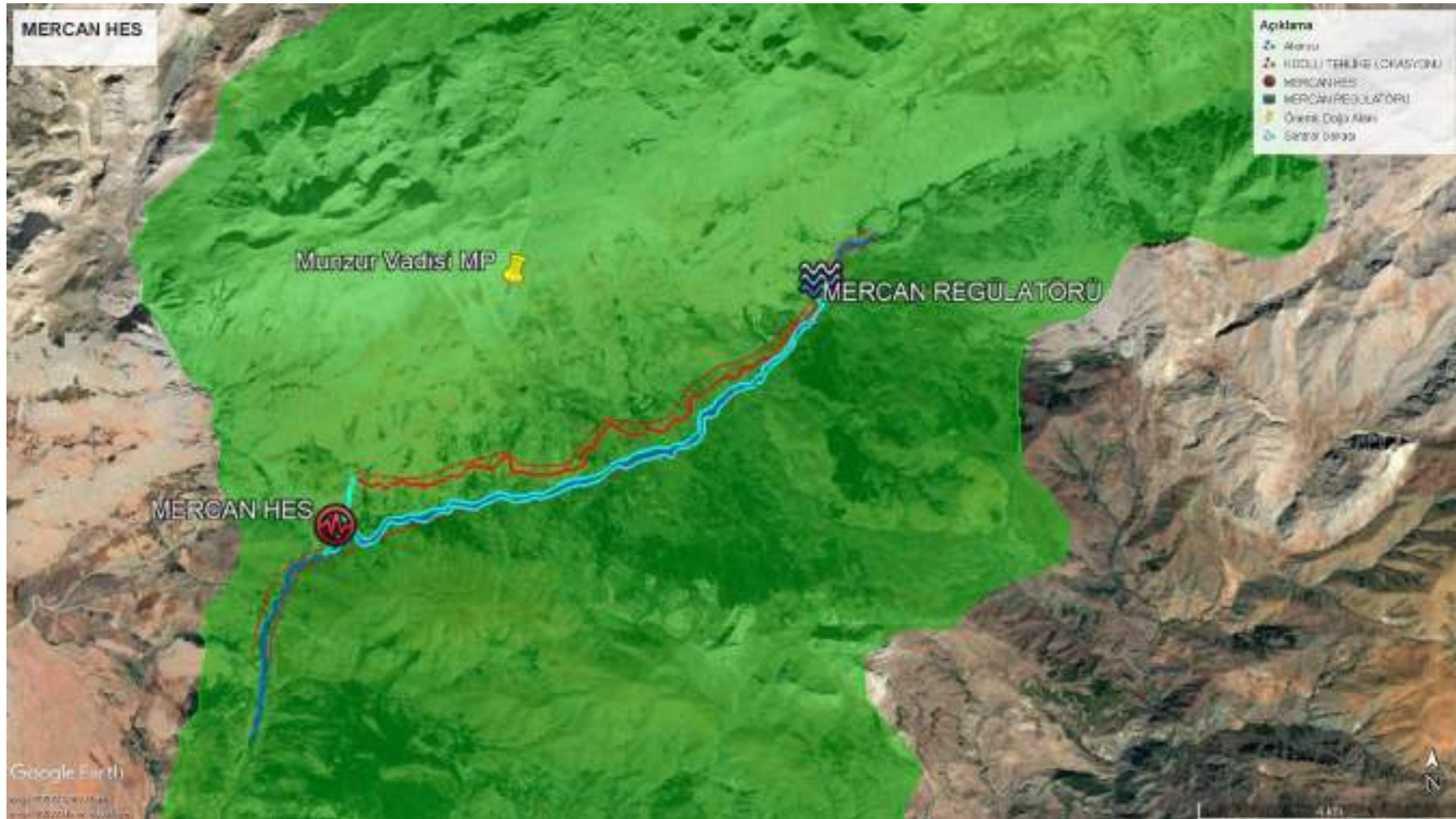


Figure 11: Satellite Image Showing the Relationship Between the Project Site and Protected Areas



Figure 12: Satellite Image Showing the Relationship Between the Project Site and Important Nature Area (INA)

1.3 Identification and Classification of Habitats in the Impact Area of Mercan Regulator and HEPP Facility

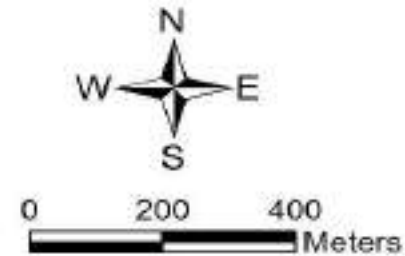
Zorlu Doğal Elektrik Üretimi A.Ş. Mercan Hydroelectric Power Plant (HEPP) Tunceli, operated by the province of East Anatolia Region, is located in the Upper Euphrates Basin and was established on the Mercan Stream. The province, which lies entirely within the Euphrates Basin, is a high region surrounded by natural borders. The extensions of the Eastern Taurus Mountains extend in the east-west direction, covering almost the entire northwest, north, and northeast of the province. Mercan HEPP is approximately 13 km from Ovacık District and approximately 71 km from Tunceli Province.

There are 11 different habitat types in the project area. 6 of these habitats are natural, and the remaining 5 are modified habitats. The 1st, 2nd, and 3rd Level codes and vegetation types of the vegetation types that develop in natural areas according to the EUNIS Habitat Classification are given below (Figure 13-14).



**Mercan HES EUNIS
Habitat Haritası 1**
Ölçek: 1:10,000

- ** Tesis binaları
- * C2.3: Mevsimsel olmayan hızlı akan akarsular
- * G1 :Yaprak döken ormanlar
- * G5:Antropojenik ormanlar, baltalıklar, ağaç hatları
- * G5.6 :Gelişmekte olan doğal ve yarı doğal ormanlar
- * H3 :Sarp yamaçlar ve ana kayanın yüzeye çıktığı taşlık alanlar
- * H5 :Bitki örtüsü seyrek açıklık alanlar
- ** J2.3 :Kırsaldaki aktif kullanılan endüstriyel yapılar
- ** J2.6 :Kırsaldaki terk edilmiş endüstriyel yapılar
- ** J4.2 :Yol ağları
- ** J4.6 : Kaldırımlar, beton yüzeyler ve rekreasyon alanları
- ** J5.41 :İnsan yapımı tatlı su kanalları
- ** J5.43 :İnsan yapımı yeraltı su kanalları



Shape 13 Coral HEPP EUNIS habitat Map one



Mercan HES EUNIS Habitat Haritası 2

Ölçek: 1:5,000

- ** ■ Tesis binaları
- * ■ C2.3: Mevsimsel olmayan hızlı akan akarsular
- * ■ F3 : Ilıman Akdeniz-dağlık bodur çalıları
- * ■ G1 :Yaprak döken ormanlar
- * ■ G5:Antropojenik ormanlar, baltalıklar, ağaç hatları
- * ■ H3 :Sarp yamaçlar ve ana kayanın yüzeye çıktığı taşlık alanlar
- * ■ H5 :Bitki örtüsü seyrek açık alanlar
- ** ■ J4.2 :Yol ağları
- ** ■ J5.43 :İnsan yapımı yeraltı su kanalları



0 100 200
Meters

Shape 14 Coral HEPP EUNIS habitat map 2

Natural Habitats

C2. Superficial Fluidity Showing Waters

Characteristic taxa of riparian habitats that form year-round streamside vegetation at an altitude of 1400 m; *Fraxinus angustifolia*, *Alnus glutinosa*, *Geranium pyrenaicum*, *Lathyrus pratensis*, *Lathyrus chloranthus*, *Filipendula ulmaria*, *Geum urbanum*, *Rubus canescens* var. *canescens*, *Agrimonia eupatoria*, *Agrimonia repens*, *Sanguisorba minor* subsp. *lasiocarpa*, *Epilobium anatolicum* subsp. *anatolicum*, *Tanacetum parthenium*, *Primula auriculata*, *Lysimachia vulgaris*, *Myosotis sylvatica* subsp. *rivularis*, *Scrophularia scopolii* var. *scopolii*, *Kickxia spuria* subsp. *integrifolia*, *Veronica beccabunga* subsp. *beccabunga*, *Stachys balansae* subsp. *balansae*, *Nepeta nuda* subsp. *albiflora*, *Prunella vulgaris*, *Mentha longifolia* subsp. *typhoides* var. *typhoides*, *Euphorbia orientalis*, *Allium schoenoprasum*, *Dactylorhiza iberica*, *Poa pratensis*.



Photos 1: Superficial Fluidity Showing Habitats (EUNIS: C2)

G1. Leaf-Shedding Oak Communities

The participants of the oak communities observed in the form of patches in the upper parts of the stream bed at an altitude of 1500 m are *Lathyrus roseus* subsp. *roseus*, *Tanacetum cilicicum*, *Tanacetum vulgare*, *Echinops galaticus*, *Echinops viscosus* subsp. *bithynicus*, *Mulgedium quercinum*, *Cephalorrhynchus tuberosus*, *Onosma rascheyanum*, *Brunnera orientalis*, *Verbascum phoeniceum*, *Stachys cretica* subsp. *garana*, *Salvia macrochlamys*, *Euphorbia macrocarpa*, *Euphorbia denticulata*, *Euphorbia cheiradenia*, *Euphorbia iberica*, *Juglans regia*, *Allium chrysanthrum*.



Photos 2 Leaf-Shedding Oak Communities (EUNIS: G1)

H3 Bedrock Soil to the Surface Rocky Fields

Plant Communities Forming the Vegetation Structure Formed on Rocky and Stony Areas at Points Where Rain and Surface Runoff Is Fast Due to the Increase in Slope Around 1700 M Altitude and Bedrock Appears; *Delphinium albiflorum*, *Papaver persicum* subsp. *persicum*, *Ricotia aucheri*, *Alyssum armenum*, *Arabis caucasica* subsp. *caucasica*, *Aubrieta canescens* subsp. *macrostyla*, *Erysimum pulchellum*, *Stellaria kotschyana*, *Dianthus hymenolepis*, *Silene bupleuroides*, *Silene stenobotrys*, *Paronychia kurdica* subsp. *kurdica* var. *kurdica*, *Atraphaxis spinosa*, *Linum mucronatum* subsp. *mucronatum*, *Genista albida*, *Oxytropis persica*, *Trifolium hirtum*, *Lotus corniculatus* var. *alpinus*, *Hedysarum syriacum*, *Potentilla argentea*, *Umbilicus erectus*, *Eryngium billardieri*, *Ferulago setifolia*, *Valerianella dactylophylla*, *Senecio eriospermus* var. *eriospermus*, *Anthemis triumfettii*, *Crepis foetida* subsp. *rhoeadifolia*, *Teucrium orientale* var. *puberulens*.



Photos 3 Bedrock Soil to the Surface Rocky Fields (EUNIS:H3)

H5 Herb Cover Rare Clearance Areas

This habitat type is observed in oak and rocky areas where a relatively certain soil layer is formed and the slope is lower than in rocky areas. Plants with steppe characteristics are represented in these areas by the following taxa; *Colutea cilicica*, *Astragalus tigridis*, *Lathyrus boissieri*, *Trigonella fischeriana*, *Medicago radiata*, *Medicago rigidula* var. *rigidula*, *Onobrychis galegifolia*, *Lisaea strigosa*, *Asyneuma lobelioides*, *Asyneuma rigidum* subsp. *rigidum*, *Onosma rascheyanum*, *Verbascum oreophilum* var. *joannis*, *Veronica orientalis* subsp. *orientalis*, *Teucrium multicaule*, *Teucrium chamaedrys* subsp. *sinuatum*, *Ziziphora clinopodioides*, *Nigella arvensis* var. *glauc*, *Consolida scleroclada* var. *rigida*, *Adonis flammea*, *Brassica elongata*, *Arabis alpina* subsp. *alpina*, *Dianthus crinitus* var. *crinitus*, *Petrorrhagia cretica*, *Silene alba* subsp. *divaricata*.



Photos 4 Herb Cover Rare Openness Fields (EUNIS:H5)

G5. Anthropogenic Character Coppice Forests

This forest type consists of degraded oak populations, and its cover has been broken. The species composition is almost the same as the G1 habitat code.

G5.6 Developing Semi-Natural Forests

These forests, which have an anthropogenic character, are communities where woody forest fruit trees (pear, hawthorn, wild apple) join the oak taxa. The species composition shows transition with the G1 coded habitats.

Modified Habitats

Areas with habitat codes J2.3, J2.6, J4.2, J5.41, J5.43 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. Care should be taken to ensure that landscaping plants used only in habitat coded J4.6 are not invasive species.



Photos 5 in the countryside Active Used Industrial Buildings (EUNIS: J2.3)



Photos 6 Path networks With sidewalks And Recreation Fields (EUNIS: J4.2 And J4.6)



Photos 7 Person making Underground Stream lines (EUNIS: J5.43)



Photos 8 Person making Salty Non This channels (EUNIS: J5.41)



Photos 9 *hesperis breviscapa* (IUCN:EN)

When looking at the vegetation structure of the project site and its surroundings; A large part of it consists of herbaceous plant composition of meadow-pasture nature. Natural forest areas consist of *Quercus petraea*-*Quercus cerris* taxa, while the woodland areas exposed to human influence are mostly shaped as coppice communities with broken cover. There are also *Alnus glutinosa*-*Fraxinus angustifolia* (Alder-Ash) riparian gallery forests along the stream.

Aquatic Habitats

Habitat degradation and decline in aquatic ecosystems is increasing day by day due to anthropogenic factors 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 to 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 classification method is one that allows a broader analysis of habitats in relation to ecological zones, climate, soil, and pressures on the environment, as well as species. It also provides a standardized terminology for comparing data with other countries, organized into main categories and their subheadings.

In the examinations and studies carried out, the pH of Mercan stream, which is characteristic, was determined to be 8.2. This condition affects the distribution of aquatic creatures. The most visible effect is that aquatic creatures cannot grow too large due to the alkalinity. Apart from this, no special habitat type was found in the area. Semi-natural habitats stand out in the regulator and power plant areas, while other areas maintain their natural habitat structure along the stream. Fish that feed on algae, zooplankton, or benthic creatures living in the area are at the top of the food chain in the water. Fish habitats in the Mercan HEPP area where observations were made are provided in Table 1.

Table 1: Mercan HEPP aquatic habitat And Features

EUNIS CODE	HABITAT NAME	FEATURES	RAID SPECIES
C2	surface streams	in the field other permanent or seasonal streams are representatives of this habitat type in the area	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.

The stream bed generally looks like a natural habitat (Photo 11). The deteriorated habitat structures around Mercan HEPP, which was established within the borders of the national park, have adapted to the natural environment since there has been no external influence on date.



Photos 10 Semi-Natural Habitat Structure Around the Outlet in Mercan Creek Regulator Area.



Photos 11 Natural Habitat Structure of Mercan Stream

1.4 Coral regulator And HEPP facility Effect in the field floristic biodiversity Definition

When looking at the vegetation structure of the project site and its surroundings; A large part of it consists of herbaceous plant composition of meadow-pasture nature. Natural forest areas consist of *Quercus petraea*-*Quercus cerris* taxa, while the woodland areas exposed to human influence are mostly shaped as coppice communities with broken cover. There are also *Alnus glutinosa*-*Fraxinus angustifolia* (Alder-Ash) riparian gallery forests along the stream.

The project area is an area rich in floristic diversity and contains endemic rare plant taxa. Critical plant taxa found in the region are presented in Table 2.

Table 2: Distribution of Plant Taxa and Habitats Protected in CR and EN Statuses within the Scope of IUCN

Critical Herb taxa	English Name	Critical habitats	IUCN status
<i>Iris galatica</i>	Galatic Iris	G1 H3 H5 G5 G5.6	CR
<i>Ornithogalum munzurensense</i>	Munzur Star-of-Bethlehem	H3 H5	CR
<i>Chaenorhinum huber-morathii</i>	Huber-Morath's Toadflax	H3 H5	EN
<i>Stachys tundjeliensis</i>	Tunceli Woundwort	G1 G5 G5.6	EN
<i>Colchicum munzurensense</i>	Munzur Meadow Saffron	G1 H3 H5	EN
<i>Bellevallia anatolica</i>	Anatolian Hyacinth	H3 H5	EN
<i>Silene manissadjianii</i>	Manissadjian's Catchfly	G1 H3 H5	EN
<i>Campanula yildirimlii</i>	Yildirim's Bellflower	H3 H5	EN
<i>Campanula quercetorum</i>	Oak Bellflower	G1 G5	EN
<i>Isatis undulata</i>	Curly Indigo	G1 G5 G5.6	EN
<i>Hesperis breviscapa</i>	Short-Stalked Dame's Rocket	H3 H5	EN
<i>Trigonosciadium intermedium</i>	Intermediate Three-Fruit	H5	EN

A comprehensive list of the project, Area of Analysis (AoA), CR, EN, and VU types (VU types likely to trigger Criterion 1b) has been developed based on baseline data. In this context, critical flora species have been identified around the project area, and the critical habitats determined in the project area are given in Table 2. As a result of the studies, 12 critical species were identified in the project area and its surroundings (Table 2). Among these species, the IUCN Status of "Iris galatica" and "Ornithogalum munzurensense" is CR, and all other species are in EN Status. In this context, the habitats where these species occur are designated as critical habitats, and attention should be paid to the actions provided in the Biodiversity Action Plan related to these habitats.

1.5 **Mercan** Regulator and HEPP Facility Impact Area Faunistic Biodiversity Assessment

1.5.1 **Amphibians**

Amphibian species found and likely to be found in the project area are listed in Table 3, and their conservation statuses are given. According to this list, there is an endemic species (**Neurergus strauchii munzurensis**) that is vulnerable (VU) in the project area.

Table 3 Project in the field Found and Finding Likely Amphibian Types

SET , - idae : Family, Type	English Name	IUCN	BERN	CITES	Habitats Directive	END
ANURA						
Bufonidae						
1. <i>Bufotes sitibundus</i>	Variable patterned night frog	D.D.	Ann-III	-	-	
hylidae						
2. <i>Hyla savignyi</i>	Green frog	LC	Ann-III	-	-	
Ranidae						
3. <i>Rana macrocnemis</i>	Uludag frog	LC	Ann-III	-	-	
4. <i>Pelophylax ridibundus</i>	Plain frog	LC	Ann-III	-	Ann- IV	
URODELA	salamanders					
Salamandridae						
5. <i>Neurergus strauchii munzurensis</i>	Mottled salamander	VU	Ann- II	-	-	+
6. <i>Salamandra infraimmaculata</i>	Turkish salamander	NT	Ann-III	-	-	

The Munzur salamander (*Neurergus strauchii munzurensis*) subspecies has been identified approximately 40 km east of the Mercan HEPP area and it is possible that this species can be found in the project area. The IUCN criterion for the species is VU and this subspecies is endemic to the region. This type is also It is on the Annex-II list of the Bern Convention (Fauna species to be strictly protected).

However, since the facility directly consists of using some of the water in the area for electricity generation and then releasing it back into the stream bed, it is possible that all water-dependent species will be directly affected by this. Other amphibian species found or likely to be found in the project area are *Bufotes sitibundus*, *Pelophylax ridibundus*, *Rana macrocnemis*, *Hyla savignyi* and *Salamandra infraimmaculata* , and they are not endangered or endemic species.

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. Possibility of presence of endemic **Munzur salamander (*Neurergus strauchii munzurensis*) subspecies in the project area** has. This subspecies is also a subspecies with a narrow distribution in the Eastern Anatolia Region. The species appears to meet the Critical species criterion, being both endemic and narrowly distributed (Criterion 2). The distribution area of this subspecies is more than 50,000 square kilometers (km²). is less. **However**, it is not possible to say that the project site is an area that regularly hosts $\geq 10\%$ of the global population size of this species and ≥ 10 of the reproductive units of a species. It is not yet known whether this species lives in the area. In this regard, according to available information, the project site **does not meet the threshold value for Criterion 2** . However, Biodiversity Action Action is taken regarding the existence and population density of this species in the project area. Attention should be paid to the actions given in the plan.

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 endangered reptile species is **the Tortoise (*Testudo graeca*)** and it is listed in the VU category. Tortoise is also included in the BERN Convention ANNEX-II and CITES ANNEX-II lists.

Mauremys caspica, *Natrix tessellata* and *Natrix natrix*, which are partially or largely water-dependent reptile species. The impact of these species will be due to the decrease in water in the section between the regulator and the power plant area in the stream bed. The reason for the decrease in water is due to the water taken for electricity production. The decrease in the amount of water in the stream is water dependent. This will mean habitat reduction for these species. Thanks to the living water left in the stream bed, their existence will not end, and their total amount in the area will probably decrease. This reduction is more likely in *Mauremys caspica*, and *Natrix tessellata* species, and the less water-dependent Semi-aquatic snake (*Natrix natrix*) will be less affected.

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

Criterion 1: Refers to Critically Endangered (CR) and/or Endangered (EN) Species. **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 distributed in the region, according to the IUCN Mediterranean assessment MOST in the category, **Mountain goat (Capra aegagrus)** IUCN Mediterranean It is listed in the VU category according to its evaluation. However, the project area remains outside the IUCN Mediterranean evaluation area, the Mediterranean area is generally Aegean, marmara And Mediterrenian regions It covers. This two-type spherical in evaluation It is not listed as endangered. Despite this, in this report, these two species are considered to be Critical species, and an evaluation has been made here. **Rocky Sleeper (Dryomys laniger)** is also distributed in the region , and the habitat of the species is the rocky areas above 1600 m just north of the project area. *Dryomys laniger* is an endemic mammal species. The IUCN criterion of the species is DD (Data Deficient) and since it is endemic and the IUCN criterion has not been determined, it has been considered as an important species and has been specially evaluated here.

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. adjacent to the project site high And Cliff in the hills endemic *Dryomys laniger* spread available. However, it has been evaluated that this species is not present in the project area in terms of habitat structure and altitude. This species is **not affected by the project.**

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 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 mammal species distributed in the region. The most important negativity observed for mammal species is the barrier effect created by the channel carrying water to the power plant. Suggestions have been made to reduce this impact.

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 Mercan HEPP is located is located on the Munzur Mountains. Munzur Mountains have a geological structure that is different from many other areas in Eastern Anatolia. The mountain itself reaches quite high altitudes and its higher parts are rocky. With this structure, it differs from many other hilly mountains in Eastern Anatolia. Due to this unique structure, it is one of the rare places in Eastern Anatolia where the endemic mammal species called *Dryomys laniger* is found. Munzur salamander (*Neurergus strauchii munzurensis*) has also been described from this region. Munzur Mountain is also home to many endemic plant species. Due to unique features such as these, the region has already been declared a National Park. Therefore, extreme caution should be exercised in the work carried out in this region and attention should be paid to the actions given in the Biodiversity Action Plan.

1.5.4 Ornithology

As a result of the studies, a total of 78 bird species were identified in the project area and its immediate surroundings. The list of these species, their global Red List status, and the status of the species in BERN, CITES and 2022 MAK decisions are given in Table 4 below.

Two of the species found around the facility are threatened on a global scale. These species are the Little Vulture (*Neophron percnopterus*). Among these species, the Red List status of the Robin (*Streptopelia turtur*) has been determined as "VU" vulnerable, and the Lesser Vulture (*Neophron percnopterus*) has been identified as "EN" endangered. Of the bird species found around the facility, 57 are in BERN Agreement Annex-2, 12 are in BERN Agreement Annex-3, 2 are in CITES Annex-1, 10 are in CITES Annex-2 and three 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

The Lesser Vulture (*Neophron percnopterus*) species has a global Red List status of "EN" endangered. The species is expected to be seen in the project area during migration and in the spring and summer months corresponding to the breeding season (Kirwan et al., 2008). 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

Facility around found birds This criterion It does not trigger.

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

Munzur Mountain is also home to many endemic plant species. Due to unique features such as these, the region has already been declared a National Park. Therefore, extreme caution should be exercised in the work carried out in this region and attention should be paid to the actions given in the Biodiversity Action Plan.

Table 4 Project in the field Found And Finding Likely Bird Types

Type scientific First Name	English name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Alectoris chukar</i>	Hennaed partridge	not endemic	LC	Annex 3	Annex 2	KD
<i>Anthus campestris</i>	Dirt pipit	not endemic	LC	Annex 2	KD	KD
<i>Anthus spinoletta</i>	Mountain pipit	not endemic	LC	Annex 2	KD	KD
<i>Apus apus</i>	Swift	not endemic	LC	Annex 3	KD	KD
<i>Apus melba</i>	Akkarınlı swift	not endemic	LC	Annex 2	KD	KD
<i>Aquila chrysaetos</i>	Rock eagle	not endemic	LC	Annex 2	KD	Annex 2
<i>Buteo buteo</i>	Hawk	not endemic	LC	Annex 2	KD	Annex 3
<i>Buteo rufinus</i>	Red hawk	not endemic	LC	Annex 2	KD	Annex 3
<i>Caprimulgus europaeus</i>	Goatsucker	not endemic	LC	Annex 2	KD	KD
<i>Carduelis carduelis</i>	Joke	not endemic	LC	Annex 2	KD	KD
<i>Carpodacus erythrinus</i>	Chitre	not endemic	LC	Annex 2	KD	Annex 3
<i>Cettia had</i>	reed warbler	not endemic	LC	Annex 2	KD	KD
<i>Cinclus cinclus</i>	breech	not endemic	LC	Annex 2	KD	KD
<i>Circaetus gallicus</i>	Snake eagle	not endemic	LC	Annex 2	KD	Annex 2
<i>Clang pomarina</i>	Small forest eagle	not endemic	LC	Annex 2	KD	Annex 2
<i>Columba livia</i>	Rock pigeon	not endemic	LC	Annex 3	Annex 2	KD
<i>Columba palumbus</i>	Tahtali	not endemic	LC	KD	KD	KD
<i>Corvus corax</i>	Raven	not endemic	LC	Annex 3	Annex 1	KD
<i>Corvus cornix</i>	Carrion crow	not endemic	LC	KD	Annex 2	KD
<i>Coturnix coturnix</i>	Quail	not endemic	LC	Annex 3	Annex 2	KD
<i>Curruca curruca</i>	Small white-throated warbler	not endemic	LC	Annex 2	Annex 2	KD
<i>Cyanistes caeruleus</i>	Blue tit	not endemic	LC	Annex 2	Annex 2	KD
<i>Delichon urbicum</i>	House swallow	not endemic	LC	Annex 2	Annex 2	KD
<i>Dendrocopos major</i>	Forest pied woodpecker	not endemic	LC	Annex 2	Annex 2	KD
<i>Dendrocopos syriacus</i>	pied woodpecker	not endemic	LC	Annex 2	Annex 2	KD

Type scientific First Name	English name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Dendrocytes medius</i>	Middle Spotted Woodpecker	Not endemic	LC	Annex 2	KD	KD
<i>Emberiza calandra</i>	Corn Bunting	Not endemic	LC	Annex 3	Annex 1	KD
<i>Emberiza melanocephala</i>	Black-headed Bunting	Not endemic	LC	Annex 2	KD	KD
<i>Eremophila alpestris</i>	Horned Lark	Not endemic	LC	Annex 2	KD	KD
<i>Falco subbuteo</i>	Eurasian Hobby	Not endemic	LC	Annex 2	KD	Annex 2
<i>Falco tinnunculus</i>	Common Kestrel	Not endemic	LC	Annex 2	KD	Annex 2
<i>Ficedula parva</i>	Red-breasted Flycatcher	Not endemic	LC	Annex 2	KD	KD
<i>Ficedula semitorquata</i>	Semi-collared Flycatcher	Not endemic	NT	Annex 2	KD	KD
<i>Fringilla coelebs</i>	Common Chaffinch	Not endemic	LC	Annex 3	Annex 1	KD
<i>Galerida cristata</i>	Crested Lark	Not endemic	LC	Annex 3	Annex 1	KD
<i>Garrulus glandarius</i>	Eurasian Jay	Not endemic	LC	KD	Annex 2	KD
<i>Gypaetus barbatus</i>	Bearded Vulture	Not endemic	NT	KD	KD	Annex 2
<i>Hieraetus pennatus</i>	Booted Eagle	Not endemic	LC	Annex 2	KD	Annex 1
<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 collurio</i>	Red-backed Shrike	Not endemic	LC	Annex 2	Annex 1	KD
<i>Lanius minor</i>	Lesser Grey Shrike	Not endemic	LC	Annex 2	KD	KD
<i>Lanius nubicus</i>	Masked Shrike	Not endemic	LC	Annex 2	KD	KD
<i>Linaria cannabina</i>	Common Linnet	Not endemic	LC	Annex 2	KD	KD
<i>Lullula arborea</i>	Woodlark	Not endemic	LC	Annex 3	Annex 1	KD
<i>Luscinia megarhynchos</i>	Common Nightingale	Not endemic	LC	Annex 2	KD	KD
<i>Merops apiaster</i>	European Bee-eater	Not endemic	LC	Annex 2	KD	KD
<i>Milvus migrans</i>	Black Kite	Not endemic	LC	Annex 2	Annex 2	Annex 2
<i>Monticola saxatilis</i>	Rufous-tailed Rock Thrush	Not endemic	LC	Annex 2	KD	KD
<i>Dendrocytes medius</i>	Middle Spotted Woodpecker	Not endemic	LC	Annex 2	KD	KD

Type scientific First Name	English name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Montifringilla nivalis</i>	White-winged Snowfinch	Not endemic	LC	Annex 2	KD	KD
<i>Motacilla alba</i>	White Wagtail	Not endemic	LC	Annex 2	KD	KD
<i>Motacilla cinerea</i>	Grey 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>Neophron percnopterus</i>	Egyptian Vulture	Not endemic	EN	Annex 2	KD	Annex 2
<i>Oenanthe isabellina</i>	Isabelline Wheatear	Not endemic	LC	Annex 2	Annex 1	KD
<i>Oenanthe melanoleuca</i>	Eastern Black-eared Wheatear	Not endemic	LC	Annex 2	KD	KD
<i>Oenanthe oenanthe</i>	Northern Wheatear	Not endemic	LC	Annex 2	Annex 1	KD
<i>Oriolus oriolus</i>	Eurasian Golden Oriole	Not endemic	LC	Annex 2	KD	KD
<i>Otus scops</i>	Eurasian Scops Owl	Not endemic	LC	KD	Annex 2	Annex 2
<i>Parus major</i>	Great Tit	Not endemic	LC	Annex 2	KD	KD
<i>Passer domesticus</i>	House Sparrow	Not endemic	LC	KD	Annex 2	KD
<i>Pernis apivorus</i>	European Honey Buzzard	Not endemic	LC	Annex 2	Annex 2	Annex 2
<i>Petronia petronia</i>	Rock Sparrow	Not endemic	LC	Annex 2	KD	KD
<i>Phoenicurus ochruros</i>	Black Redstart	Not endemic	LC	Annex 2	KD	KD
<i>Phylloscopus trochilus</i>	Willow Warbler	Not endemic	LC	Annex 2	KD	KD
<i>Pica pica</i>	Eurasian Magpie	Not endemic	LC	Annex 2	Annex 2	KD
<i>Picus viridis</i>	European Green Woodpecker	Not endemic	LC	Annex 2	KD	KD
<i>Ptyonoprogne rupestris</i>	Eurasian Crag Martin	Not endemic	LC	Annex 2	KD	KD
<i>Pyrrhonorax graculus</i>	Alpine Chough	Not endemic	LC	Annex 2	KD	KD
<i>Pyrrhonorax pyrrhonorax</i>	Red-billed Chough	Not endemic	LC	Annex 2	KD	KD
<i>Sitta europaea</i>	Eurasian Nuthatch	Not endemic	LC	Annex 2	KD	KD
<i>Streptopelia turtur</i>	European Turtle Dove	Not endemic	VU	Annex 3	Annex 2	KD
<i>Tetraogallus caspius</i>	Caspian Snowcock	Not endemic	LC	KD	KD	Annex 1

Type scientific First Name	English name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Turdus merula</i>	Common Blackbird	Not endemic	LC	Annex 3	Annex 2	KD
<i>Turdus viscivorus</i>	Mistle Thrush	Not endemic	LC	Annex 3	Annex 1	KD
<i>Upupa epops</i>	Eurasian Hoopoe	Not endemic	LC	Annex 2	KD	KD

1.1 Identification of Hydrobiological Biodiversity in the Impact Area of Mercan Regulator and HEPP Facility

Sixteen taxa belonging to four families were identified within the project area and its immediate surroundings (Table 8). Regarding the IUCN criteria for these species, 5 are classified as "NE" (Not Evaluated), 1 as "DD" (Data Deficient), and 10 as "LC" (Least Concern).

The Cyprinidae family is represented by the highest number of species, with 11 taxa being caught. Among the Salmonidae family, *Salmo macrostigma* is considered the most important fish species in the Mercan Stream. Additionally, the genera *Barbus*, *Capoeta*, and *Squalius* stand out in terms of species diversity. It has been determined that *Salmo macrostigma* (Mountain Trout), *Capoeta umbla* (Deer Fish), and *Chondrostoma regium* are the species with the highest population density, respectively. These species are widespread and abundant in the inland waters of Anatolia.

In these areas, there are also species from the Cobitidae family, which prefer flowing waters and seek shelter and food. Notably, *Sabanejewia aurata* is represented with a high density. This species is found in the Eastern and Southeastern Anatolia regions.

Salmo macrostigma (Mountain Trout) and *Oncorhynchus mykiss* (Rainbow Trout) from the Salmonidae family were identified. *Salmo macrostigma* is widespread throughout the Mercan Stream and is considered highly delicious and economically important, although fishing it is prohibited. The capture of this species outside the borders of the national park is prohibited year-round according to the circulars published by the Ministry of Agriculture and Rural Affairs. *Oncorhynchus mykiss* (Rainbow Trout) is generally used and farmed in aquaculture. This species is not native to Turkey but is an exotic species introduced from abroad. It was raised in an aquaculture environment and has adapted to natural waters in Turkey.

The species *Glyptothorax armeniacum* is a suction cup fish found throughout the Tigris and Euphrates River systems, which prefers flowing waters.

The *Glyptothorax armeniacum* species is a suction cup fish that is found throughout the Tigris and Euphrates system and loves flowing waters.

Table 5 Mercan stream Alga Types

Class: BACILLORIOPHYCEA
Order: pennales
Family: Achnanthaceae
<i>Achnanthes flexella</i> there is. <i>flexella</i>
<i>Achnanthes bireviceps</i> there is. <i>intermedia</i>
<i>Achnanthes microcephala</i>
<i>Achnanthes minutissima</i>
<i>cocconeis placenta</i> there is. <i>euglypta</i>
Family: naviculaceae
<i>amphora commutata</i>
<i>amphora ovalis</i>
<i>amphora veneta</i>
<i>stauroneis smithii</i>
<i>anomoeoneis sphaerophora</i>
<i>caloneis bacillum</i>
<i>caloneis permagna</i>
<i>Cymbella affinis</i>
<i>Cymbella amphicephala</i>
<i>Cymbella asperaea</i>
<i>Cymbella caespitosa</i>
<i>Cymbella cistula</i>
<i>Cymbella lanceolata</i>
<i>Cymbella minuta</i>
<i>Cymbella tumidula</i>
<i>didymosphaenia geminata</i>
<i>Diploneis ovalis</i>
<i>gomphonema acuminatum</i>
<i>gomphonema angustatum</i>
<i>gomphonema gracile</i>
<i>gomphonema olivaceum</i>
<i>gomphonema parvalum</i>
<i>gyrosigma acuminatum</i>
<i>gyrosigma attenuatum</i>
<i>Navicula cincta</i>
<i>Navicula cryptocephala</i>
<i>Navicula cuspidata</i>
<i>Navicula nivalis</i>
<i>Navicula pygmaea</i>
<i>Navicula radiosa</i>
<i>Navicula tuscula</i>
<i>Navucila bacillum</i>
<i>neidium dubium</i>
<i>pinnularia borealis</i>
<i>pinnularia microstauron</i>
<i>pinnularia viridis</i>
<i>Rhoicosphenia abbreviata</i>
Family: Epithemiaceae
<i>caretoneis arcus</i>
<i>denticula kuetzingii</i>
<i>Epithemia Argus</i>

<i>Epithemia sorex</i>
<i>Rhopalodia gibba</i>
Family: Bacillariacea
<i>Bacillaria paradoxa</i>
<i>hantzschia amphioxys</i>
<i>Nitzschia amphibia</i>
<i>Nitzschia constricta</i>
<i>Nitzschia gracilis</i>
<i>Nitzschia hungarica</i>
<i>Nitzschia obtusa</i>
<i>Nitzschia palea</i>
<i>Nitzschia sigmoidea</i>
<i>Nitzschia tryblionella</i>
Family: surirellacea
<i>Cymatopleura solea</i>
<i>surirella brebissonii</i>
<i>surirella ovalis</i>
Family: Fragilariacea
<i>diatom tenuis</i>
<i>diatom vulgaris</i>
<i>diatom monoliformis</i>
<i>Fragilaria capucina</i>
<i>Fragilaria contruens</i>
<i>Fragilaria dilatata</i>
<i>Fragilaria ulna</i>
<i>meridion circulare</i>
Order: centrales
Family: Melosiraceae
<i>Melosira varians</i>
Family: Thalassiosiraceae
<i>aulacoseira granulate</i>
<i>cyclotella comta</i>
<i>cyclotella meneghiniana</i>
<i>cyclotella ocellata</i>
Class: CYANOPHYCEA
Order: Chroococcales
<i>Chroococcus turgidus</i>
<i>gomphosphaeria aponina</i>
<i>Merismopedia glauca</i>
<i>Merismopedia punctate</i>
<i>microcystis aeruginosa</i>
Order: Hormogonales
<i>anabaena komvophoron</i>
<i>calothrix fusca</i>
<i>Lynbya hieronymusii</i>
<i>nostoc commune</i>
<i>Oscillatoria formosa</i>
<i>Oscillatoria lamosa</i>
<i>Oscillatoria rubescens</i>
<i>Oscillatoria subbrevis</i>

<i>spirulina laxissima</i>
<i>spirulina major</i>
<i>spirulina sp.1</i>
<i>pseudoanabaena sp.</i>
<i>Schizothrix natans</i>
<i>Gloeotrichia echinulata</i>
Class: CHLOROPHYCEA
Order: Volvocales
<i>Chlamydomonas globosa</i>
<i>Gonium pectoral</i>
Order: Tetrasporales
<i>Gloeocystis sp.</i>
Order: ulothrichales
<i>ulothrix subconstricta</i>
Order: Cladophorales
<i>Cladophora fracta</i>
<i>Cladophora glomerata</i>
Order: oedogoniales
<i>oedogonium sociale</i>
Order: chlorococcales
<i>Ankistrodesmus falcatus</i>
<i>coelastrum sp.</i>
<i>oocystic borgei</i>
<i>oocystic Crassa</i>
<i>Pediastrum borianum</i>
<i>Pediastrum duplex</i>
<i>Pediastrum simplex</i>
<i>Scenedesmus acuminatus</i>
<i>Scenedesmus in quadricau</i>
<i>tetrahedron minimum</i>
Order: Zygnematales
<i>Mougeotia sp.</i>
<i>Spirogyra dubia</i>
<i>Spirogyra sp. one</i>
<i>Spirogyra sp. 2</i>
<i>Zygnema ericetorum</i>
<i>Zygnema sp.</i>
Order: Desmidiiales
<i>Closterium aciculare</i>
<i>Closterium lunula</i>
<i>cosmarium obtusatum</i>
<i>cosmarium botrystis</i>
<i>cosmarium garnet</i>
Class: EUGLENOPHYCEA
Order: Euglenales
<i>Euglena sp.</i>
<i>Euglena oxyrus</i>
<i>Euglena polymorpha</i>
<i>Phacus in curvica</i>
<i>trachelomonas sp.</i>

Class: PYRROPHYCEAE
Order: peridinales
<i>glenodinium sp.</i>
<i>peridinium sp.</i>

Table6 Mercan of your tea zooplanktonic Types

ROTIFERA
<i>brachionus patulus</i>
<i>brachionus calyciflorus</i>
<i>brachionus urceolaris</i>
<i>colurella colurus</i>
<i>colurella adriatica</i>
<i>colurella obtusa</i>
<i>cephalodella gibba</i>
<i>cephalodella catellina</i>
<i>cephalodella ventripes</i>
<i>Dissotrocha sp.</i>
<i>Euchlanis sp.</i>
<i>keratella quadrata</i>
<i>keratella tecta</i>
<i>hexarthra sp.</i>
<i>Lecane closteroerca</i>
<i>Lecane lunaris</i>
<i>Lecane hamata</i>
<i>lepadella patella</i>
<i>lepadella quadricarinata</i>
<i>Lindia sp.</i>
<i>polyarthra remata</i>
<i>proales theodora</i>
<i>proales fallaciosa</i>
<i>philodina megalotrocha</i>
<i>Bedelloid rotifer</i>
CLADOCERA
<i>Alona rectangular</i>
IN COPEPO
<i>cyclops vicinus</i>
<i>Nauplius</i>

Table 7 Mercan stream benthic organisms

Branch: MOLLUSIAN
Class: GASTROPODA
Set: PROSOBRAHCHIATA
Family: Valvatidae
<i>Valvata piscinalis</i> Müller
Set: PULMONATA
Family: Planorbidae
<i>gyraulus albus</i> Müller
Family: Ancyliidae
<i>Ancylus fluviatilis</i> mulle
Branch: ANNELIDA
Class: CLITELLATA
Set: HIRUDINEA
Family: Erpobdellidae
<i>Erpobdella octoculata</i> L.
Class: OLIGOCHAETA
Set: LUMBRICULIDAE
<i>Lumbriculus variegatus</i> (Müller, 1774)
Set: TUBIFICIDA
Family: tubificidae
<i>tubifex tubifex</i> (Müller, 1774)
Family: Naididae
<i>Nais communis</i> Piguët, 1906
Branch: PLATYHELMINTHES
Class: TURBELLARIA
Set: TRICLADIDA
Family: Planariidae
<i>Planaria</i> sp .
Branch: ARTHROPODA
Class: CRUSTACEA
Set: AMPHIPODA
Family: Gammaridae
<i>gammarus pulex</i>
<i>gammarus lacustris</i>
Set: IN DECAPO
Family: Oniscidae
<i>Potamon</i> sp.
Class: INSECTA
Set: HEMIPTERA
Family: Hydrometridae
<i>hydrometra</i> sp.
Family: Corixidae
<i>Corixa</i> sp .
Family: Gerridae
<i>Geris</i> sp .
Family: Notonectidae
<i>notonecta</i> sp.

Set: COLEOPTERA
Family: Elmidae
<i>Elmis</i> sp.
<i>Limnius</i> sp
Family: Hydrophilidae
<i>Hydrobius fuscipes</i> (Linnaeus, 1758)
Family: Noteridae
<i>noterus</i> (<i>Noterus</i>) <i>clavicornis</i> (Also Geer, 1774)
Family: Dytiscidae
<i>Hydroporus marginatus</i> (Duftschmid, 1805)
<i>laccophilus minutus</i> (Linnaeus, 1758)
Set: EPHEMEROPTERA
Family: Baetidae
<i>Baetis rhodani</i> Pict.
<i>Baetis vernus</i> (Curtis, 1834)
<i>cloeon dipterum</i> (Linnaeus, 1761)
Family: Oligoneuriidae
<i>oligoneuriella orontensis</i> Koch
<i>oligoneuriella zanga</i>
Family: heptageniidae
<i>Ecdyonurus autumnalis</i> braasch
<i>Rhithrogena anatolica</i> earnings
<i>Rhithrogena caucasica</i>
<i>iron alpestris</i> braasch
<i>iron caucasicus</i>
<i>heptagenia</i> sp.
<i>heptegenia longicauda</i> (Stephens, 1835)
Family: Ephemerellidae
<i>Ephemeralla ignita</i> (Poda, 1761)
Family: Caenidae
<i>Caenis macrura</i>
Set: PLECOPTERA
Family: nemouridae
<i>nemoura</i> sp.
Family: Taeniopterygidae
<i>taeniopteryx</i> sp .
Family: perlodidae
<i>isoperla obscura</i>
<i>perlodes</i> sp .
Family: perlidae
<i>perla marginate</i>
Set: TRICHOPTERA
Family: Rhyacophilidae
<i>rhyacophila</i> sp .
Family: psychomyidae
<i>psychomyia compass</i> Fbr.
Family: Hydroptilidae
<i>hydroptila</i> sp.
Family: Limnophilidae
<i>limnephilus</i> sp .
Family: Hydropsychidae
<i>hydropsyche</i> sp .

Family: Leptoceridae
<i>Leptocerus</i> sp.
Set: ODONATA
Family: Aeshnidae
<i>Anax imperator</i>
<i>Aeshna</i> sp.
Family: Cordulegasteridae
<i>Cordulegaster boltonii</i>
Family: calopterygidae
<i>calopteryx splendens</i>
Family: Coenagrionidae
<i>coenagrion</i> sp.
Set: DIPTERA
Family: Blephariceridae
<i>liponeura cinerascens</i>
Family: Limoniidae
<i>dicranota bimaculata</i>
<i>Eriocera</i> sp .
Family: Simuliidae
<i>Simulium</i> sp .
<i>Simulium morcitance</i>
<i>Simulium angustipes</i>
<i>prosimulium</i> sp .
Family: Empididae
<i>Wiedemannia</i> sp .
Family: Athericidae
<i>Atherix ibis</i> F.
Family: chironomidae
<i>Orthacladiinae</i> sp .
<i>Procladius (Holotanypus)</i> sp .
<i>Corynoneura</i> sp.
<i>Thienemanniella</i> sp .
Class: ARACHNIDAE
Set: Aranea
Family: arachnidae
<i>araneagen</i> sp .

Table 8 Mercan Tea I Fish Types And Protection Status

Family	Type And subspecies	English Name	endemism	BERN	IUCN	CITES	natural kind	exotic species
<i>Salmonidae</i>	Salmo Macrostigma (DUMERIL, 1858)	Brown Trout	-	-	D.D.	-	X	-
<i>Salmonidae</i>	Oncorhynchus Mykiss (WALBAUM, 1792)	Rainbow Trout	-	-	NE	-	-	X
<i>Cyprinidae</i>	Acanthobrama marmid HECKEL, 1843	Tigris Bream	-	-	LC	-	X	-
<i>Cyprinidae</i>	alburnoides bipunctatus (BLOCH, 1782)	Dotted Barbel	-	-	LC	-	X	-
<i>Cyprinidae</i>	Alburnus mossulensis HECKEL, 1843	Mosul Bleak	-	-	NE	-	X	-
<i>Cyprinidae</i>	barbus lacerta (HECKEL, 1843)	Moustached Barbel	-	-	LC	-	X	-
<i>Cyprinidae</i>	Luciobarbus mystaceus (Pallas 1814)	Lake Trout	-	-	NE	-	X	-
<i>Cyprinidae</i>	Capoeta umbla (HECKEL, 1843)	Tigris Barb	-	-	LC	-	X	-
<i>Cyprinidae</i>	Capoeta trutta (HECKEL, 1843)	Karaburun Bleak	-	-	LC	-	X	-
<i>Cyprinidae</i>	chondrostoma regime (HECKEL, 1843)	Common Goby	-	-	LC	-	X	-
<i>Cyprinidae</i>	gobio gobio HECKEL, 1843	Doctor Fish	-	-	LC	-	X	-
<i>Cyprinidae</i>	garra rufa (HECKEL, 1843)	Chub	-	-	LC	-	X	-
<i>Balitoridae</i>	Squalius cephalus (L., 1758)	Golden Spined Loach	-	-	LC	-	X	-
<i>Balitoridae</i>	Sabanejewia aurata FILLIPPI, 1865	Stone Loach	-	-	LC	-	X	-
<i>Sisoridae</i>	Paracobitis malapterura (Valenciennes 1846)	Armenian Catfish	-	-	LC	-	X	-
<i>Salmonidae</i>	Salmo Macrostigma (DUMERIL, 1858)	Brown Trout	-	-	D.D.	-	X	-

1.6 Biodiversity Risk Evaluation

1.6.1 Flora

A comprehensive list of the project, Area of Analysis (AoA), CR, EN and VU types (VU types likely to trigger Criterion 1b) has been developed based on baseline data. In this context, critical flora species have been identified around the project area, and the critical habitats determined in the project area are given in Table 2. made as a result of the studies, 12 critical species were identified in the project area and its surroundings (Table 2). Among these species, the IUCN Status of "*Iris galatica*" and "*Ornithogalum munzurensense*" is CR, and all other species are in EN Status. In this context, the habitats where these species occur have been determined as critical habitats, and information about critical habitats is given in Table 9.

Table9 IFC In the scope of Critical Type And habitat Evaluation

Critical Herb taxa	English Name	Critical habitats
<i>Iris galatica</i>	Galactic Iris	G1, H3, H5, G5, G5.6
<i>Ornithogalum if necessary</i>	Munzur Star	H3, H5
<i>Chaenorhinum huber-morathii</i>	Ozge Snapdragon	H3, H5
<i>Stachys tundjeliensis</i>	Tundjeli's Stachys	G1, G5, G5.6
<i>Colchicum if necessary</i>	Munzur Crocus	G1, H3, H5
<i>Bellevalia anatolica</i>	Anatolian Bellevalia	H3, H5
<i>Silene manissadjianii</i>	Manissadjian's Silene	G1, H3, H5
<i>Campanula yildirimlii</i>	Yildirimli's Bellflower	H3, H5
<i>Campanula quercetorum</i>	Oak Campanula	G1, G5
<i>Isatis undulata</i>	Wavy Leaf Woad	G1, G5, G5.6
<i>Hesperis breviscapa</i>	Short-Stemmed Hesperis	H3, H5
<i>Trigonosciadium intermedium</i>	Intermediate Trigonosciadium	H5

1.6.2 Invasive Species

Alien invasive species, whether by accident or intention, expand beyond their native geographic regions and become problematic. This often happens due to the globalization of the economy, which facilitates the movement of people and goods, including ship transportation, the shipment of wood products, insect-infested consignments, or the transfer of ornamental plants to new regions. The European Union (EU) has developed Regulation (EU) 1143/2014 to actively address the issue of alien invasive species.

Invasive species (IAS) can have severe ecological impacts on the environments they invade. These species often lack natural predators in their new surroundings, allowing them to proliferate and spread rapidly. They can carry diseases, outcompete or prey on native species, disrupt food chains, and even alter ecosystems, such as by changing soil composition or creating conditions that favor wildfires. These effects can lead to the extinction of native species on a local or global scale, ultimately causing ecological destruction.

Invasive species also present significant socio-economic challenges. The EU incurs annual losses of approximately EUR 12 billion due to the effects of IAS on human health, infrastructure, and agriculture.

Europe is home to over 12,000 alien species, with 15% classified as invasive. Invasive species are the third most significant threat to endangered species in Europe. A 2015 report indicated that 354 endangered species (229 animals, 124 plants, and 1 fungus) are affected by IAS, accounting for 19% of all threatened species in Europe. The EU's newly adopted Biodiversity Strategy emphasizes the importance of addressing this threat by managing established invasive species and aiming to reduce the number of Red List species they endanger by 50% by 2030.

In 2013, the European Commission (EC) proposed a law under an EU Directive on IAS, focusing on preventing the introduction of these species, providing early warning and rapid response, and ensuring effective and coordinated management. Since 2016, the International Union for Conservation of Nature (IUCN), through a series of service contracts and collaboration with the IUCN Invasive Species Specialist Group (ITSG), has been providing technical and scientific support for implementing the EU IAS Regulation.

Invasive flora species have been identified within the project's impact area (Table 10). Compliance with the Biodiversity Action Plan is required.

Energy investment areas are regions shaped by human activity. Construction activities, arising from the nature of the investment in these areas, have been rehabilitated through landscape planning around roads and buildings. The ability of some plant species used in these rehabilitations to survive and spread in the area leads to their classification as invasive species. Besides rehabilitation efforts, species carried by floods or faunistic sources may also exhibit invasive characteristics. For these reasons, to preserve the natural areas within the energy investment site, it is necessary to remove these plants and their diaspores (reproductive units) from the area.

Timing: The control of invasive plant species should be carried out before the plants go to seed. If the plant can be identified by its above-ground parts before flowering, removal should be done in the spring; if not, it should be removed immediately after flowering.

Table 10: Invasive Species Found in the Project Area

<i>Acer negundo</i> (ash tree leafy maple) Areas open to andropogenic influence	
<i>agropyron repens</i> (Separate herb) Field, open area	

<i>ailanthus altissima</i> (Kokarağaç) andropogenic to the effect open spaces		
<i>amaranthus retroflexus</i> (Fox dry) Field, open area		
<i>Boreava orientalis</i> (Sariot) field, roadside		
<i>chenopodium album</i> (Sneezing) Flood, flood bearings		
<i>Cirsium arvense</i> (Köygöçüren) Flood, flood bearings		

<i>conyza canadensis</i> (cypress) andropogenic to the effect open fields		
<i>conyza bonariensis</i> (Coyote) andropogenic to the effect open fields		
<i>conyza albida</i> (maplewort) andropogenic to the effect open spaces		
<i>Cuscuta campestris</i> (Turkish) meadow-pasture habitats		

<i>Lepidium draba</i> (Diġnik) andropogenic to the effect open spaces	
<i>nasturtium officinale</i> (Suteresi) streamside	
<i>Reseda lutea</i> (Love flower) Path edge, field	
<i>rumex acetocella</i> (Sorrel) Path edge, field And barren places	

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

<i>paspalum distichum</i> (This discrete) This communities inside on channels		
<i>Robinia pseudoacacia</i> (White flowering liar acacia) roadsides		
<i>xanthium strumarium</i> (Big Pitrak) Flood, flood bearings		
<i>xanthium spinosum</i> (Yellow Pitrak) Flood, flood bearings		

Viscum album (Lime herb) to the trees interference



1.6.2 Fauna

Considering the criteria of IFC PS-6 and Guidance Note 6, the "critical species" and "critical habitat" evaluations were conducted in section 3.5. It was determined that there are no critical species in terms of fauna (Amphibia, Reptile, Mammal) in the region, and consequently, no critical habitats are present.

Risk Assessment for Munzur Salamander (*Neurergus strauchii munzurensis*):

This species of salamander is water-dependent. The Mercan HEPP facility, being water-based, has the potential to affect this species. However, to determine the extent of any impact, it must first be established whether the species is actually present in the project area. During the April-May period, when the species is active in water and can be detected, the presence and abundance of the species in the project area must be assessed. It is crucial to conduct this study before the regulator area in the watercourse, between the regulator area and the section where the power plant releases water back into the stream, and after the power plant. This will help to interpret whether there is a significant decrease in the species' population in areas where the power plant diverts water into a closed channel and consequently reduces the water flow in the stream bed. Additionally, small wetlands with rich biodiversity have formed along the edge of the channel in some areas where water leaks from the closed channel carrying water from the regulator to the loading pool. The Munzur salamander should be investigated in these areas, and its positive contribution to the species' shelter should be demonstrated. After gathering this data, if the species is found to be widespread in the project area, the positive or negative effects of the facility on the species can be accurately assessed.

Risk Assessment for Tortoise (*Testudo graeca*): This species has been observed around the area, and its presence in the region has been assessed as sparse. Since it is not a water-dependent species, it has been determined that the facility does not negatively impact this species. However, raising awareness about this species and taking certain precautions to prevent harm, particularly during human-tortoise encounters, would be beneficial. These issues are detailed in the Biodiversity Action Plan.

Risk Assessment for Lynx (*Lynx lynx*): The habitat of the project area and its surroundings appears very suitable for this species. The lynx is difficult to spot because it prefers to stay away from humans and is very well camouflaged. Due to the lynx's lifestyle, it is unlikely that it would be adversely affected by the HEPP facility. However, increasing awareness about the species and taking precautions to prevent harm, particularly during human-lynx encounters, would be helpful. These issues are detailed in the Biodiversity Action Plan.

Risk Assessment for Mountain Goat (*Capra aegagrus*): The project area and its surroundings contain very suitable habitats for this species. Due to the animal's lifestyle and mobility, it is not expected to be negatively impacted by the existing facility. However, attention should be paid to the issues highlighted in the Biodiversity Action Plan, particularly concerning the risks of falling into the facility's water channels and the potential disturbance caused by facility vehicles and personnel.

Risk Assessment for the Rock Sleeper (*Dryomys laniger*): The interior of the project site does not seem suitable as a habitat for this species. In previous studies conducted to identify this species in the region, it was observed that the rock sleeper prefers rocky habitats, particularly those above 1800 meters. Even in suitable habitats around 1500 meters, no specimens of the species were captured. Although the species is generally distributed in the region, it is unlikely to be found within the project site and the immediate surroundings within a 250-meter radius for two reasons. First, the altitude range of the facility is between 1250-1600 meters, and the elevations above 1800 meters preferred by the species are not present in the project area. Second, the species' typical habitat consists of cracked rocky areas and regions with abundant fragmented stones from these rocks. Such habitats are not found in the project area, which is mostly composed of soil-based regions. Therefore, it was concluded that the species does not inhabit the area, and no action was recommended for this species.

1.6.3 Ornithology

Taking into account the criteria of IFC PS-6 and Guidance Note 6, the "critical species" and "critical habitat" evaluations were conducted in section 3.5. It was determined that there are critical species in terms of birds in the region. The critical species identified is the Lesser Vulture (*Neophron percnopterus*). Attention should be given to the actions outlined in the Biodiversity Action Plan concerning this species.

Additionally, several other soaring bird species have been detected around the facility, and there is a risk of these species colliding with transmission lines. Among these species are the Red Hawk (*Buteo rufinus*) and the Lesser Forest Eagle (*Clanga pomarina*). The facility's location at the valley floor helps reduce the risk of bird collisions with the electrical transmission lines within the facility (Hanssen et al., 2020). The facility and the regulator's reduction of water flow directly impact birds that rely on the stream and its riparian habitats. These birds include the Brook Wagtail (*Cinclus cinclus*), White Wagtail (*Motacilla alba*), and Mountain Wagtail (*Motacilla cinerea*). Therefore, it is crucial to ensure that sufficient water flow is maintained at all times in the region between the regulator and the HEPP to support these bird species. Necessary assessments should be made on this matter, and if required, measures should be taken according to the results (see Biodiversity Action Plan). Apart from this, the facility does not have a direct negative impact on bird diversity and populations.

1.6.4 Hydrobiology

The construction of the Mercan HEPP regulator dam has raised concerns, particularly regarding the adaptation of fish species living in the Mercan Stream to the newly formed stagnant water habitat. Aquatic species typically adapt to the specific living conditions in a river section, forming characteristic biocoenoses shaped by the change in abiotic factors along the stream (Vannote et al., 1980). Algae, zooplankton, and benthic organisms living in the stream environment may also lead to significant changes in the food pyramid by forming new communities within this biocoenosis. More productive stagnant water environments can become essential feeding grounds for all aquatic organisms.

Fishing activities in Mercan Stream are entirely prohibited since the area lies within national park boundaries. No economic fish species, particularly *Salmo macrostigma*, are allowed to be caught with fishing rods or other tools. Furthermore, the area is inspected by the Ministry of Forestry and Water Affairs. Despite these prohibitions and inspections, illegal fishing activities still occur in the region, carried out by local people using fishing nets and rods. In this context, attention should be given to the actions outlined in the Biodiversity Action Plan specific to the project area.

1.6.5 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 11.

Table 11 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. Regarding the issue dated 26.06.2021 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	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; 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. 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".
		Medical Wastes	For medical waste generated within the scope of the activity; waste at the source -most member will download system establishment 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 wastes separately at the source without mixing with each other, 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.
		Waste Electronic Things	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.

		Waste oils	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 respects to be is required. Formed waste oils Temporary

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 06.06.2015 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 license 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

Mercan regulator And hes facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
M1	Critical Habitats	Critical Habitat Protection	Critical Habitats (G1, H3, H5, G5, G5.6)	Project Effect Area It should be protected because it contains habitats that have not lost their naturalness and contain critical flora species.	Tree segments of Prevention, Not Throwing Waste or Residual Materials, Not Lighting Fires, Preventing Dust Emission from Vehicles and Raising Awareness with Warning Signs Your studies to be done	During Operation	During Operation
M2	Critical Habitats	Critical Conservation of Plant Species	(G1, H3, H5, G5, G5.6)	Endangered Flora types Research should be conducted in the Project Area and its surroundings	Species/Population by Expert Biologists Level Monitoring	During Operation	Between March and November Each Moon 3 Days, Total 27 Days 5 Years Population Views And Mapping
M3	All Habitats	Critical Conservation of Fauna Species	General Area	Endangered Fauna types Research Particularly Little Vulture (<i>Neophron Percnopterus</i>) Type in Project Area and Surroundings It should be investigated	Species/Population by Expert Biologists Level Monitoring	During Operation	2 Year Duration: March- November Between

M4	All Habitats	Critical Conservation of Fauna Species	General Area	Munzur Salamander (<i>Neurergus Strauchii Munzurensis</i>) The Project Area and Its Surroundings Should Be Investigated	Species/Population by Expert Biologists Level Monitoring	During Operation	April-May 2023 per year one Times
M5	Business	Critical Fauna	Project Area	Munzur salamander	subject professional	Business	2024 Year

Mercan regulator And hes facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
		Conservation of Species	And surroundings	(<i>Neurergus Strauchii Munzurensis</i>) Type About Facility To its employees Training Should Be Given	biologists Training Should Be Provided by	During	April-May per year one Times
M6	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 may come out signs It must be placed.	Biologists who are experts on the subject Training Should Be Provided by	During Operation	April-May 2024 one Times
M7	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 Give to Animals It is necessary.	Company By	During Operation	Continually

M8	Business	Fauna Conservation of Species	Project Area And surroundin gs	Tortoise (<i>Testudo Graeca</i>), Mountain goat (<i>Capra Aegagrus</i>) and Lynx <i>Lynx</i> in the Field 4 points along the canal in order not to cause a barrier effect of the canals on the mobility and mobility of other animals. More Animal Must be paraded	In the Coordination of Biologists Expert on the Subject By Company	During Operatio n	2023 May- August

Mercan regulator And hes facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
M9	Business	Fauna Conservation of Species	Project Area And surroundings	In and Around the Field All razor blade And Barbed Wires Should Be Removed. These Wires May Injure Animals Trying to Enter and Exit the Field. Fences to be used in and around the field must be in the form of cage wire and must be of a structure that will not cause injury to animals. to be It is required	Company By	During Operation	Continually

Mercan regulator And hes facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
M10	Business	Fauna Conservation of Species	Project Area And surroundings	Pet Cats Should Never Be Kept in the Facility. It is recommended not to have pet dogs, but even if they are kept, they should not be allowed to roam freely, especially at night. Otherwise, These Species And surrounding They Can Cause Serious Damage to Wild Animals. Instructions for keeping a pet should be prepared in facilities where pet dogs are kept, these pets should be chipped, the number of pets, the conditions under which they are kept in the facility, the purpose for which they are used, annual veterinary examination. Peak Who is Responsible for Reports and Maintenance? It must be reported.	Company By	During Operation	Continually
M11	All Habitats	Invader Blocking Species	Project Area And surroundings	Investigation of Invasive Species Found in the Project Area and Surroundings Project Area And Around by watching dismantling of your plan Must be prepared	Species/Population by Expert Biologists Level Monitoring	During Operation	one Year Duration in July and August

Mercan regulator And hes facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
M12	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
M13	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
M14	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
M15	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

M16	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	

TERCAN DAM AND HEPP FACILITY BIODIVERSITY ACTION PLAN

1.1 Entrance

Operated by Zorlu Doğal Elektrik Üretimi A.Ş., the Tercan Dam and Hydroelectric Power Plant (HEPP) is located within the borders of Tercan district in Erzincan Province, Eastern Anatolia Region. It is situated on the Tuzla Stream, a left-bank tributary of the Karasu Stream which is an upper segment of the Euphrates River, at the thalweg elevation of 1,410.00 m. The dam and power plant project is mapped on the 1/25,000 scale topographic maps İ44-b3 and İ44-c2 of Erzincan, covering Tuzla Stream (Euphrates Basin). The Tercan Hydroelectric Power Plant (HEPP) at Tuzla Stream has a thalweg at 1,410.00 m and a crest at 1,470.00 m, with a zoned earth-fill structure holding a normal water level lake volume of 178 hm³ and a lake area of 8.9 km². The waters carried from Tercan Dam Lake to the power plant through a submerged, concrete-coated, 4.0 m diameter steel pipe are initially diverted to Tercan Irrigation, owned by the DSI 8th Regional Directorate and benefiting from the dam. The water from the energy tunnel is split into four via a pant-type force pipe (three units of 1.75 m diameter and one unit of 1.10 m diameter steel pipes) and directed to the turbines. The plant houses three turbines generating 51 GWh of energy at a power output of 3 x 5.00 MWe (15 MWe). The Tercan HEPP building currently accommodates three vertical-axis turbine generator units and a bottom outlet valve chamber. The turbine capacity is 15 MWe.

The area within the project's boundaries, Erzincan province, is surrounded by the Munzur Mountains to the southwest and Refahiye Mountains to the northwest. Karasu River, flowing from east from Erzurum and extending westwards, deeply divides the province, leaving wide plains in between. Coşan Mountain is the highest point in the province at 3,976 m. Approximately 60% of the province's terrain is mountainous.

The Kop Mountains, which border the Tercan Plains to the north, form a steep and orderly range that joins with the Gavur Mountains to the north of Erzincan. At an elevation of 2,400 m on the Kop Mountains, the Alevi Pass connects Tercan to Bayburt. To the west of this basin lie the Mülpet and Keşiş Mountains (Esence Mountains). The Kop Mountains split into two branches west of the Çayırılı region: the first extending towards the north of Erzincan city center and the second turning southeast, forming first the Keşiş and then the Mülpet Mountains.

In Erzincan province, plains are located in the depression areas between the mountain ranges extending in the east-west and north-south directions. The plains are connected to each other by gorges. The Erzincan Plain is surrounded by the Otlukbeli Mountains to the northwest and the Esence Mountains to the north. Among these, the Otlukbeli Mountains form the watershed line that separates the catchment basin of the Yeşil River from the Euphrates (Karasu) basin. The Esence Mountains form the watershed line between the Çayırlı Plain and the Erzincan Plain.

The Erzincan Plain is surrounded to the west by Karadağ (Köhnem Mountain, 3,045 m) and to the south by the Mercan Mountains, which form the northeastern part of the Munzur Mountains. The Mercan Mountains form the watershed line between the Karasu-Aras mountain range's western section and the Munzur River - Pülümür Stream, which are tributaries of the Euphrates in the north and the Murat River in the south.

As mentioned above, the Erzincan Plain has an average elevation of 1,200 meters, situated between the surrounding mountains. There are elevation differences of up to 2,250 meters between the plain and the mountains to the south, and up to 2,350 meters between the plain and the mountains to the north.

The Erzincan Plain, excluding the surrounding mountainous areas, is lower than the Tercan Plain (1,400-1,450 m) to the east, the Refahiye Plain (1,600 m) to the west, and the Kelkit (1,450 m) and Bayburt (1,600 m) plateaus to the north, and it has almost the same elevation as the Pülümür and Ovacık (1,000-1,200 m) valleys to the south. The plain, which has an oval basin appearance, extends approximately 55 km in a southeast-northwest direction, and the surrounding mountains rise suddenly.

The Keşiş-Esence Mountains surrounding the Erzincan Plain from the north and west and the Munzur Mountains surrounding it from the south have completely different characteristics in terms of both topographic features and lithological structures. Despite being located in a northern geographical section of Eastern Anatolia, in the Upper Euphrates section, the Erzincan Plain has a relatively high annual average temperature. If we accept the average elevation of the plain as 1,200 meters, there is an elevation difference of 2,200 – 2,300 meters between the plain and the surrounding mountains (Esence Mountains, 3,537 m; Munzur Mountains, 3,462 m).

This elevation difference ensures that the plain is in a sheltered position compared to its surroundings. There is an east-west running fault line in the north. Irrigated agriculture is practiced on the plain, which is covered with a thick layer of alluvium. The plain area, which also includes the Erzincan Plain and the surrounding mountainous belt, has an area of approximately 1,628.52 hectares, with a high percentage of 54.7% (89,094 ha) consisting of pasture areas (1,276 ha of meadows). This is followed by 38.7% (62,950 ha) of agricultural lands, 3.7% (6,028 ha) of rocky-sandy and swampy areas, 0.9% (1,454 ha) of forest areas, and 2% (3,326 ha) of residential areas (including cities). The area is of medium productivity and grows wheat, sugar beet, and beans. The many plains on both sides of the Euphrates Valley up to the Sansa Strait form the Tercan Plains. The largest is the Çadırkaya (Pekeriç) Plain, with an area of 180 km². This plain, which is 1,450-1,500 m above sea level, is covered with a thick alluvial layer. One-twentieth of the total area is covered by plateaus.

The plateaus on the extensions of the Munzur Mountains in the south, especially in the Koşan Mountain region, are covered with sparse and short grass. There are oak groves in places. Further east, on the Erzurum-Erzincan-Bingöl border, there are fertile plateaus on the extensions of the Cemal Mountains in Erzincan. Among the important ones, Çimen, Melan, and Sarıçiçek plateaus have rich vegetation. The largest and most important river in the province is the Euphrates River. The Euphrates is used for irrigation, energy, and water sports purposes with its flow rate varying between 43.8 m³/s and 1,320 m³/s. In the Tercan Plains, the Çayrılık Stream originating from the Keşiş Mountains in the northwest and the Tuzla Stream in the southeast join the Euphrates.

Starting from where the waters meet in the Tercan Plain, the largest tributary of the Euphrates is called Karasu. In the Erzincan Plain, the Euphrates River receives the Mercan, Kom, Cimin, Pahnik, and Sürperen waters and the Çardaklı Stream from both sides. After the Erzincan Plain, the river flows in a deep bed until Bağıştaş. After receiving the Kadıgölü water and Miran water in the Kemaliye district, the Euphrates enters the Elazığ provincial border near Başpınar in the southeast of the district.

Approximate distances to nearby villages from the project site are: Daritepe Village about 0.4 km, Elaldı Village 0.4 km, Kuzuören Village 0.7 km, Dalıca Village 2.0 km, Kızılca Village 0.6 km, Yavuz Selim Village 1 km, Tercan Village 1.9 km, Müftüoğlu Village 0.7 km, Fındıklı Village 2.3

km, Yaylacık Village 2.9 km, Tepebaşı Village 2.7 km, Güzbudak Village 5.8 km, Küllüce Village 6.2 km, Gökpınar Village 7.7 km, Kalecik Village 9.1 km, Ovacık Village 10.3 km, Tokça Village 10.3 km, Koçbaba Village 9.3 km, Yalınkaş Village 4.9 km, Yaylayolu Village 4.3 km, Yumruveren 21.9 km, Göktaş Village 6.2 km, Gedikdere Village 8.2 km, Sağlıca Village 7.5 km, Armutluk Village 14 km, Yenibucak Village 13.9 km, Sarıkaya Village 8.0 km, Kurukol Village 8.0 km, Beşkaya Village 4.6 km, Gevenlik Village 6.9 km, Topalhasan Village 5.3 km, Aktaş Village 6.0 km, Karacaören Village 3.9 km, Hacıbayram Village 6.5 km, Edebük Village 14.8 km, Mercan Village 11 km, Gökçe Village 13.3 km, Haydarhacı Village 19.6 km, Tuzluca Village 17.2 km, Hacıbekir Village 12.9 km, Eyüpoğlu Village 14.9 km, Mustafabey Village 10.2 km, and Esenevler Village 6.9 km. (Figure 3-6).

There are important water bodies around the project site that will attract birds. (Figure 7-8).



Figure 2: Satellite Image of Tercan HES Project Area

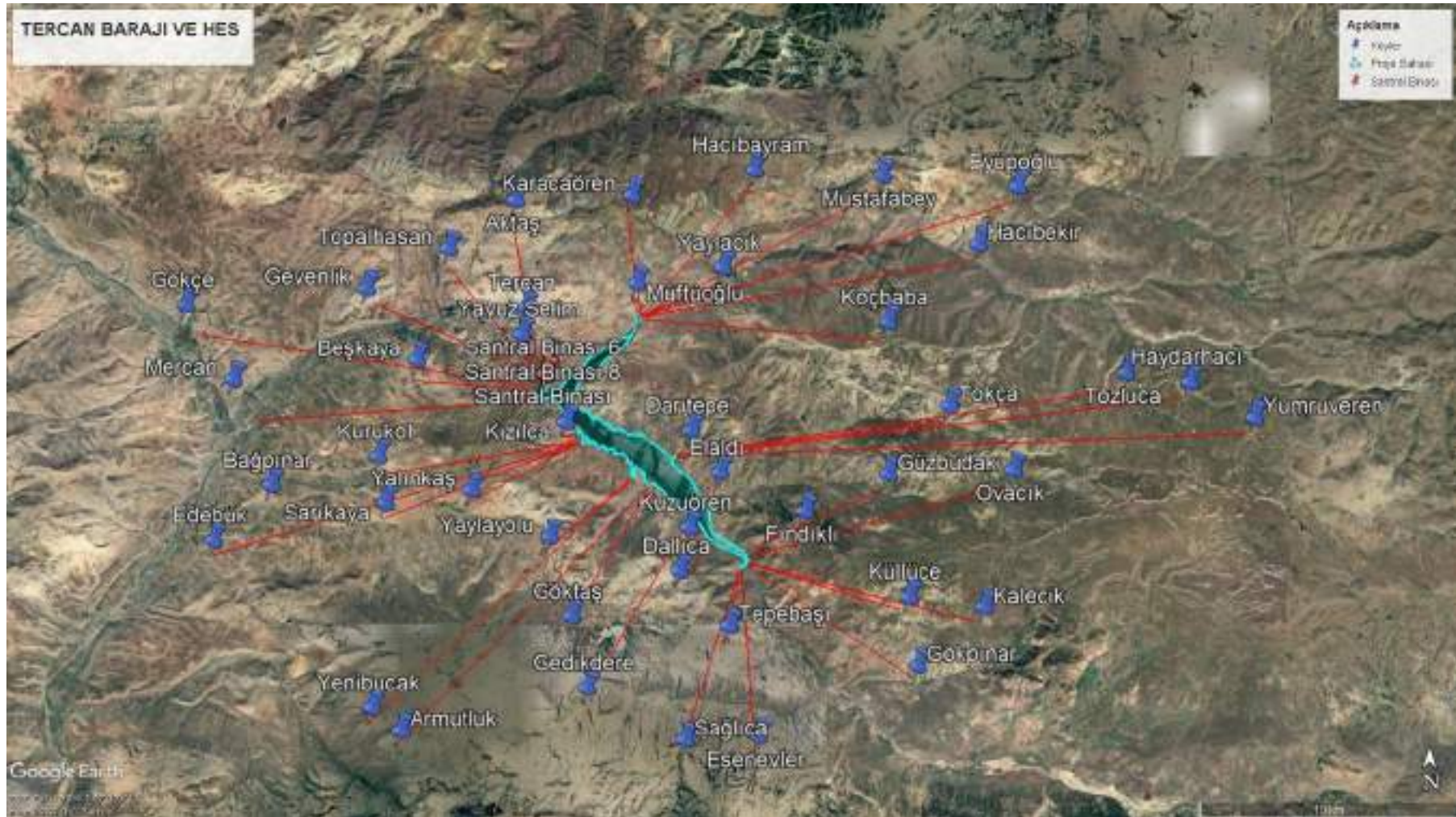


Figure 3: Village (Neighborhood) Settlements Near the Project Area



Figure 4: Village (Neighborhood) Settlements Near the Project Area

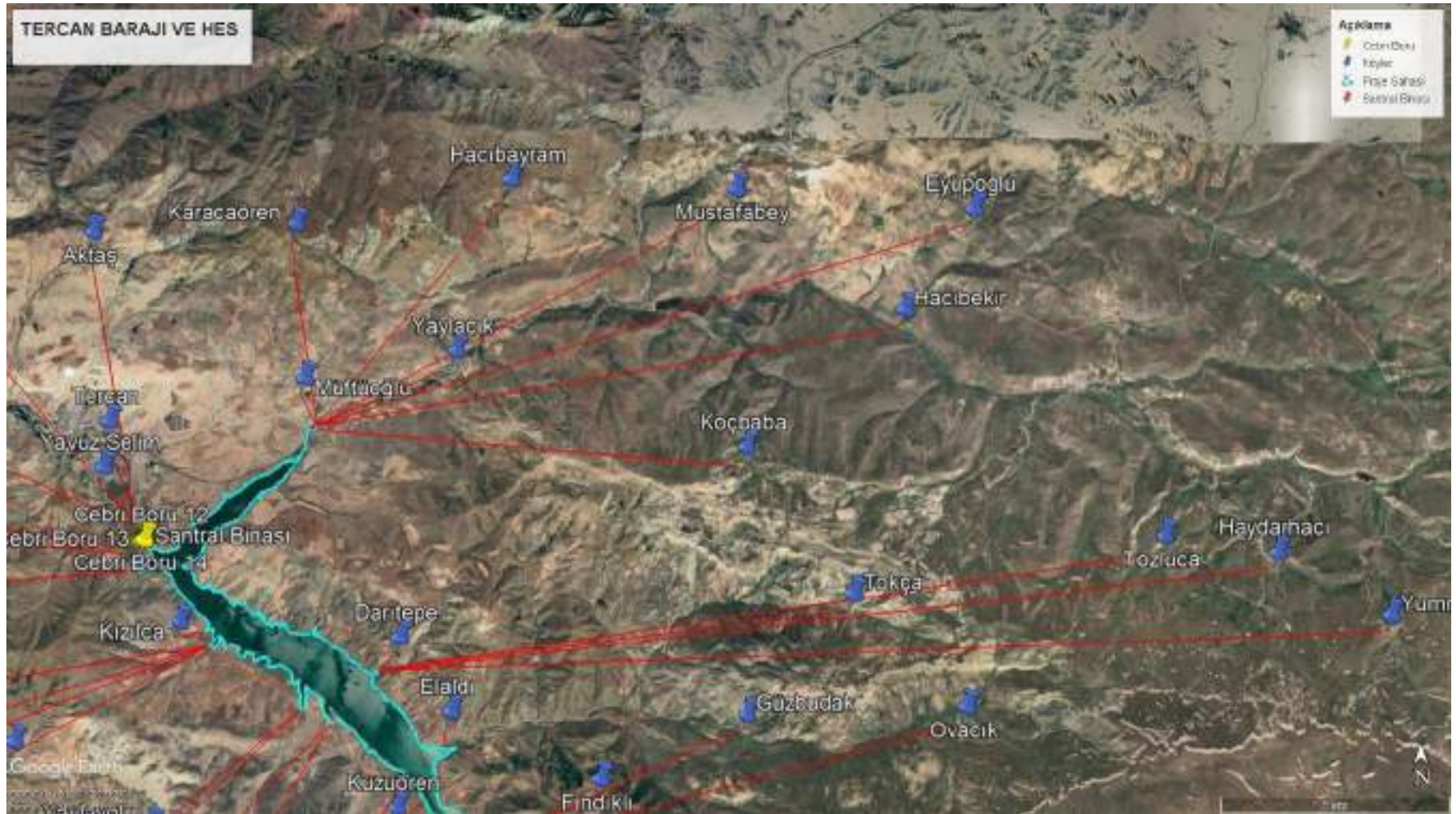


Figure 5: Village (Neighborhood) Settlements Near the Project Area

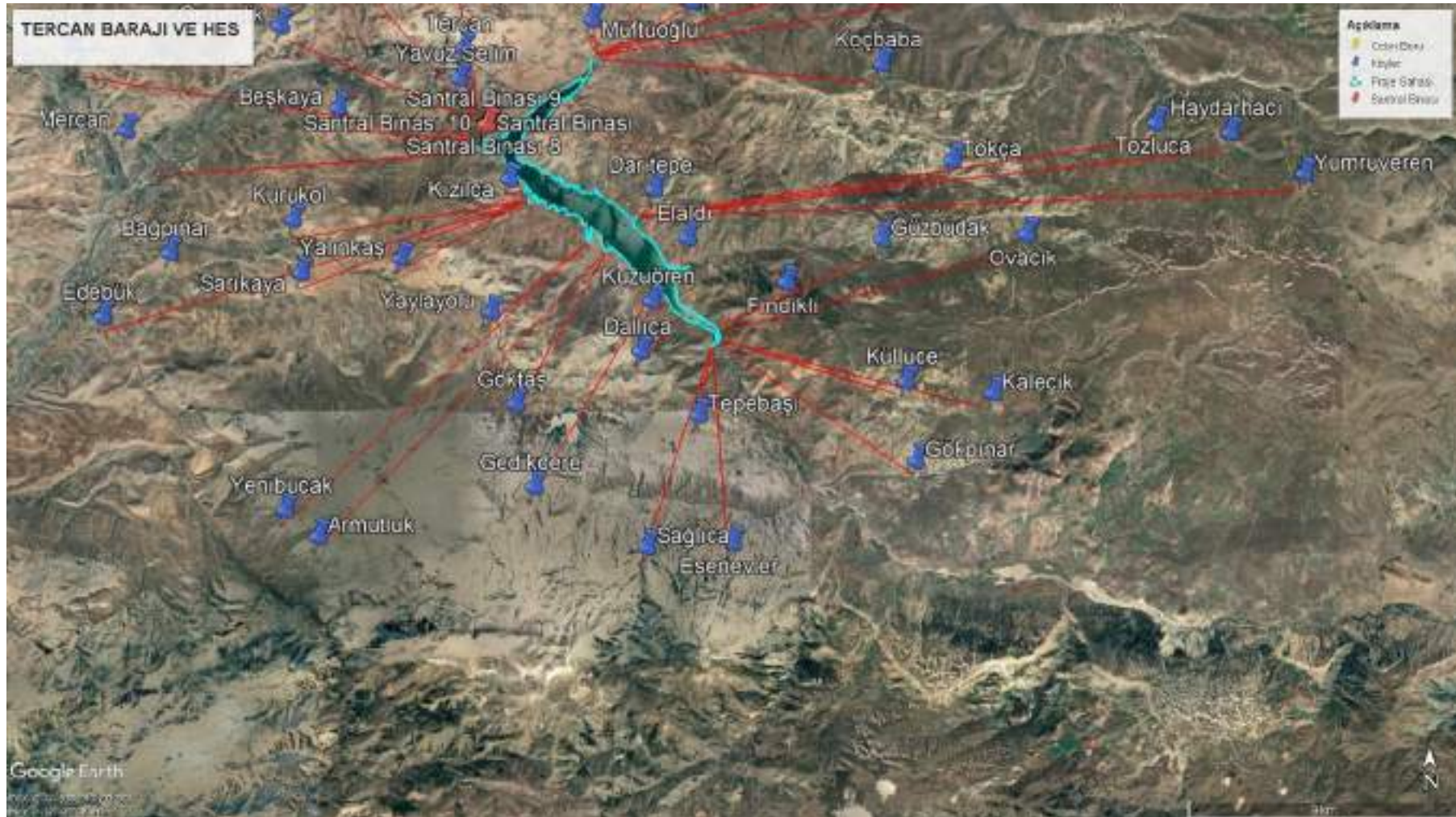


Figure 6: Village (Neighborhood) Settlements Near the Project Area



Figure 7: Significant Water Bodies Around the Project Area



Figure 8: Significant Water Bodies Around the Project Area

1.2 Relationship of the Area with Protected and Special Status Areas

Considering the location of the Tercan Dam HES site, the surrounding protected areas, and important natural areas; Kop Mountain TMP is 23 km away, Erzurum ÇAT approximately 16.9 km away, and Bingöl Kığı Şeytandağları 26.5 km away from the project site by air. Furthermore, the Esence (Kesis) Mountains KBA is 12 km away, and Kop Mountains KBA is also 12 km away as the crow flies (Figure 9-10).



Figure 9: Satellite Image Showing the Relationship Between the Project Area and Protected Areas



Figure 10: Satellite Image Showing the Relationship Between the Project Area and Protected Areas

1.3 Definition and Classification of Habitats in the Impact Area of Tercan Dam and HEPP Facility

Operated by Zorlu Doğal Elektrik Üretimi A.Ş., the Tercan Dam and Hydroelectric Power Plant (HEPP) in Eastern Anatolia Region, within the borders of Tercan district, Erzincan province, was built on the Tuzla Stream, a left-bank tributary of the Karasu Stream which is the upper part of the Euphrates River, at the 1,410.00 m thalweg elevation. The project operates on Tuzla Stream (Euphrates Basin) and is mapped on the 1/25,000 scale topographic map sheets İ44-b3 and İ44-c2 titled “Tercan Dam and Hydroelectric Power Plant (HEPP)”.

The project area contains 11 different habitat types. Of these habitats, six are natural, one is semi-natural, and four carry modified habitat characteristics. The 1st, 2nd, and 3rd level codes and vegetation types of the developing vegetation in natural areas according to the EUNIS Habitat Classification are presented below (Figure 11).

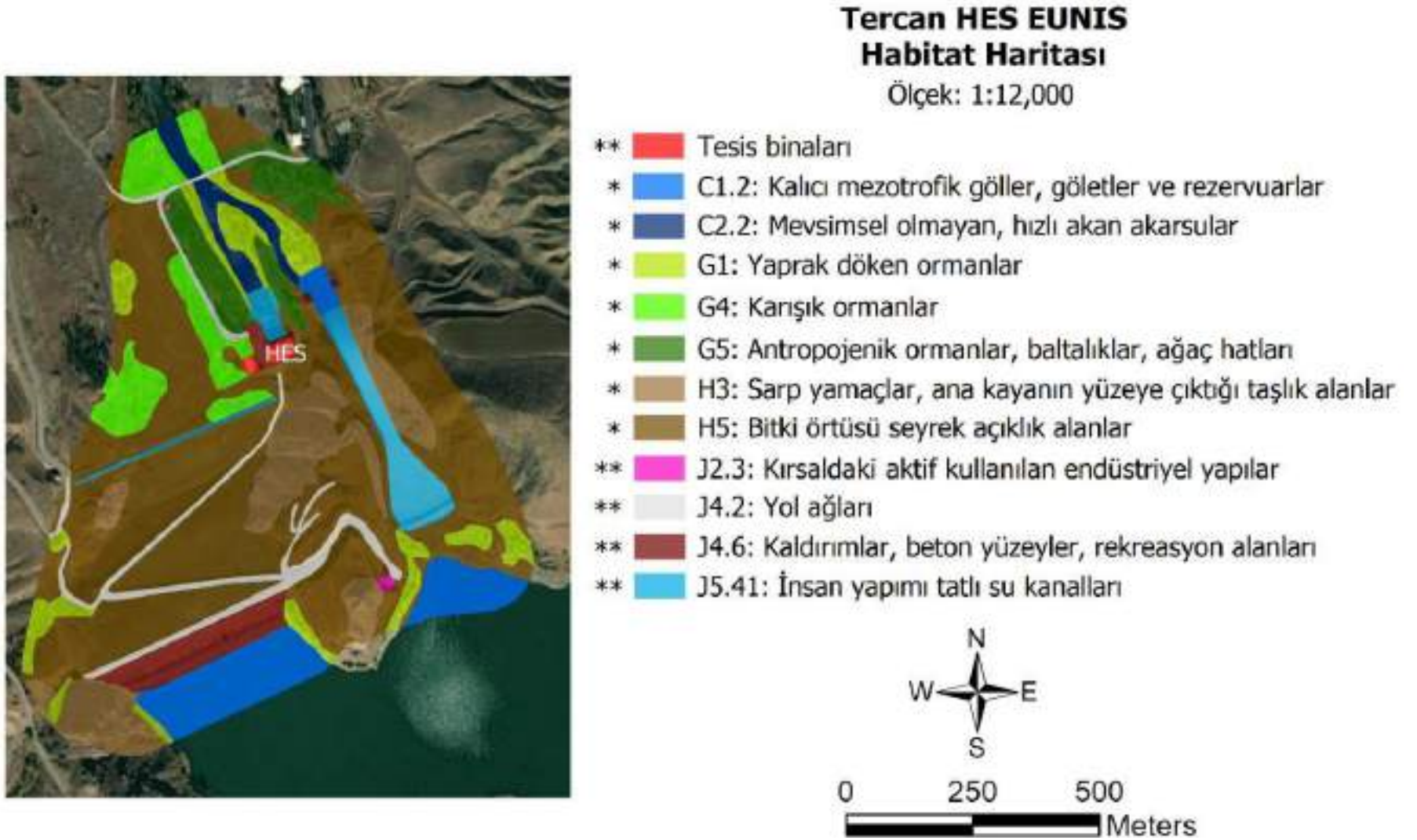


Figure 11: EUNIS Habitat Map of Tercan HES

Natural Habitats

C1.2 Permanent Mesotrophic Lakes, Ponds, and Reservoirs

The pond at Tercan, created by human influence at an altitude of 1450 m, exhibits fluctuations due to variability in the annual precipitation balance. For this reason, a stable vegetation structure does not form on the lakeshore. However, there is vegetation consisting of hydrophilic plants shaped according to the water mirror. These include **Camphorosma monspeliaca subspecies lessingii**, **Sophora alopecuroides variety alopecuroides**, **Epilobium parviflorum**, **Hippuris vulgaris**, **Oenanthe silaifolia**, **Leonurus glaucescens**, **Plantago maritima**, **Alisma lanceolatum**, **Typha laxmannii**, **Juncus heldreichianus subspecies orientalis**, **Blysmus compressus**, **Carex paniculata subspecies paniculata**, **Carex panicea**, **Carex hordeistichos**, **Eremopyrum orientale**, and **Sonchus erzincanicus**.



Photos 1: Permanent Mesotrophic Lakes, Ponds, and Reservoirs (EUNIS: C1.2)

C2.2 seasonal Non, Fast Flowing streams

They are plant communities around stream beds that show continuous fluidity at an altitude of 1400 m. These; *Linum catharticum* , *Frangula alnus subspecies pontica* , *Geum rivale* , *Sanguisorba armena* , *Epilobium parviflorum* , *Epilobium gemmascens* , *Parnassia palustris* , *Myrrhoides nodosa* , *Conium maculatum* , *Ligusticum alatum* , *Heracleum antasiaticum* , *Valeriana alliariifolia* , *Vincetoxicum tmoium* , *Teucrium scordium subspecies scordioides* , *Stachys setifera subspecies setifera* , *Stachys spectabilis* , *Nepeta transcaucasica* , *Euphorbia orientalis* , *Galium verum subspecies verum* , *Carex panicea* , *Salix fragilis* , *Populus alba* .



Photos 2: Perennial, Fast-Flowing Rivers (EUNIS: C2.2)

G1 Leaf Deciduous Forests

The dominant components that make up the composition of these forests, distributed at altitudes of 1400 m, are **Quercus robur** subspecies **pedunculiflora**, **Quercus pubescens**, **Quercus infectoria**, **Amygdalus communis**, **Amygdalus orientalis**, **Rosa foetida**, **Crataegus tanacetifolia**, **Crataegus monogyna** subspecies **monogyna**, **Polygonatum orientale**, **Allium paniculatum** subspecies **paniculatum**, **Echinops galaticus**, **Paracaryum strictum**, **Alkanna froedinii**, **Scrophularia ilwensis**, and **Salvia candidissima** subspecies **candidissima**.

G4 Mixed Forests

These are habitats with fragmented rocky and stony areas created by surface flow at an altitude of 1445 m. Plant taxa found in this area include **Nigella oxytpetala**, **Delphinium dasystachyum**, **Ranunculus brachylobus** subspecies **incisilobatus**, **Ranunculus kotschyi**, **Berberis crataegina**, **Papaver dubium** subspecies **laevigatum**, **Brassica elongata**, **Conringia planisiliqua**, **Isatis cappadocica** subspecies **cappadocica**, **Aethionema oppositifolium**, **Aethionema caespitosum**, **Fibigia clypeata**, **Alyssum propinquum**, **Hesperis schischkinii**, **Erysimum smyrnaeum**, **Arenaria kotschyana** subspecies **kotschyana**, **Arenaria acutisepala**, **Silene longipetala**, **Paronychia kurdica** subspecies **montis-munzur**, **Rumex angustifolius** subspecies **macranthus**, **Erodium absinthoides** subspecies **armenum**, **Centranthus longiflorus**, **Astragalus angustifolius** subspecies **pungens**, **Bellevallia crassa**, **Hesperis breviscapa**, **Thymus convolutus**, **Trigonosciadium intermedium**, and **Verbascum leiocarpum**.

H3 Steep Slopes, Rock Outcrops, and Stony Fields

These are habitats with fragmented rocky and stony areas created by surface flow at an altitude of 1445 m. Plant taxa found in this area include ***Nigella oxyptetala***, ***Delphinium dasystachyum***, ***Ranunculus brachylobus* subspecies *incisilobatus***, ***Ranunculus kotschyi***, ***Berberis crataegina***, ***Papaver dubium* subspecies *laevigatum***, ***Brassica elongata***, ***Conringia planisiliqua***, ***Isatis cappadocica* subspecies *cappadocica***, ***Aethionema oppositifolium***, ***Aethionema caespitosum***, ***Fibigia clypeata***, ***Alyssum propinquum***, ***Hesperis schischkinii***, ***Erysimum smyrnaeum***, ***Arenaria kotschyana* subspecies *kotschyana***, ***Arenaria acutisepala***, ***Silene longipetala***, ***Paronychia kurdica* subspecies *montis-munzur***, ***Rumex angustifolius* subspecies *macranthus***, ***Erodium absinthoides* subspecies *armenum***, ***Centranthus longiflorus***, ***Astragalus angustifolius* subspecies *pungens***, ***Bellevallia crassa***, ***Hesperis breviscapa***, ***Thymus convolutus***, ***Trigonosciadium intermedium***, and ***Verbascum leiocarpum***.



Photos 3: Rocky Areas Where Bedrock is Exposed (EUNIS: H3)

H5 Herb Cover Rare Openness Fields

At 1500 m altitude, plants distributed in these habitats include **Consolida glandulosa**, **Alyssum stylare**, **Alyssum dasycarpum** variety **dasycarpum**, **Gypsophila perfoliata** variety **perfoliata**, **Dianthus calocephalus**, **Silene cappadocica**, **Silene alba**, **Kochia prostrata**, **Erodium ciconium**, **Bunium microcarpum** subspecies **bourgaei**, **Anthemis tinctoria** variety **tinctoria**, **Achillea coarctata**, **Artemisia austriaca**, **Gundelia tournefortii** variety **tournefortii**, **Jurinea aucherana**, **Achillea biebersteinii**, **Centaurea pulchella**, **Convolvulus arvensis**, **Dactylis glomerata**, **Melilotus officinalis**, and **Reseda tomentosa** var. **glabrata**.



Photos 4: Sparsely Vegetated Open Areas (EUNIS: H5)

Half Natural Habitats

G5. Anthropogenic Coppice Forests

This forest type consists of degraded oak populations with broken cover. The species composition is almost identical to the G1 and G4 habitat codes, and the plant species are similar taxa.

Modified Habitats

Areas with habitat codes **J2.3**, **J4.2**, **J4.6**, and **J5.41** are either concrete or asphalt and lack floral content. However, cleaning the seeds that germinate in the cracks of these structures is important for maintaining system integrity.



Photos 5: Industrial Buildings Actively Used in Rural Areas (EUNIS: J2.3) and Road Networks with Pavements and Recreation Areas (EUNIS: J4.2 and J4.6)



Photos 6: Man-Made Non-Saline Water Channels (EUNIS: J5.41)



Photos 7: *Achillea biebersteinii*



Photos 8: *Centranthus longiflorus*



Photos 9: *Convolvulus arvensis*



Photos 10: *Dactylis glomerata*



Photos 11: *Melilotus officinalis*



Photos 12: *Pinus sylvestris*

When we look at the vegetation of the project site and its surroundings; A large part of it consists of lakeside and streamside vegetation. In addition to deciduous and mixed forests, coppice deciduous forests due to human influence, steep slopes, stony areas and clearings with steppe character constitute the general vegetation structure of the area.

➤ **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 Tercan HEPP area in the examinations and studies carried out. 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 Tercan HEPP area where observations were made are given in Table 1.

Table 1 Tercan HEPP aquatic habitat And Features

EUNIS CODE	HABITAT NAME	FEATURES	RAID SPECIES
C2	surface streams	in the field other permanent or seasonal streams are representatives of this habitat type in the area	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 the hornbill (<i>Chondrostoma regium</i>), fresh water mullet (<i>Squalius cephalus</i>) type diversity more is too much.

The stream bed generally looks like a natural habitat (Photo 13-14). The deteriorated habitat structures around Tercan HEPP have adapted to the natural environment since there has been no external influence so far.



Photos 13: Tercan HEPP in the field Exit juice around Semi-Natural habitat Structure



Photos 14 :Tuzla stream Natural habitat Structure

1.1 Tercan Dam And HEPP facility Effect in the field Floristic Defining Biodiversity

When we look at the vegetation of the project site and its surroundings; A large part of it consists of lakeside and streamside vegetation. In addition to deciduous and mixed forests, coppice deciduous forests due to human influence, steep slopes, stony areas and clearings with steppe character constitute the general vegetation structure of the area.

The project area is an area rich in floristic diversity and containing endemic rare plant taxa . Plant taxa protected under IUCN EN statuses in the region are presented in Table 2 .

Table 2: Distribution of Plant Taxa and Habitats Protected in CR and EN Statuses within the Scope of IUCN

Critical Herb taxa	English Name	Critical habitats	IUCN status
<i>Bellevia Crassa</i>	Virgo hyacinth	H3	MOST
<i>hesperis breviscapa</i>	highland eveningstar	H3	MOST
<i>Reseda tomentosa there is. glabrata</i>	towel necklace	H5	MOST
<i>Sonchus erzincanicus</i>	sorrel	C1.2	MOST
<i>Thymus convolutus</i>	bend down thyme	H3	MOST
<i>Trigonostadium intermedium</i>	sapphirewort	H3	MOST
<i>verbascum leiocarpum</i>	Robust mullein	H3	MOST

Critical Species and Habitats Analysis

A comprehensive list of CR, EN, and VU species (with VU species likely to trigger Criterion 1b) for the project's Area of Analysis (AoA) has been developed based on baseline data. In this context, critical flora species have been identified around the project area, and the critical habitats determined in the project area are listed in Table 2. As a result of the studies, 7 critical species have been identified in and around the project area (Table 2). All of these species have EN Status. In this context, the habitats where these species occur have been identified as critical habitats, and attention should be paid to the actions outlined in the Biodiversity Action Plan concerning these habitats.

1.2 Tercan Dam and HEPP facility Effect in the field faunistic Defining Biodiversity

1.2.1 Amphibian

that are and are likely to be found in the project area are listed and critical species are given in the report. There are no endangered and/or endemic amphibian species in the project area. Amphibian species found in the area are common species. The Tercan Dam lake and the post-dam stream environment appear to be quite suitable for amphibians. Plenty of *Pelophylax during field work ridibundus* (Lowland frog) was observed. No negativity or precautions that need to be taken have been observed for amphibians 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.

1.2.2 Reptiles

There are no endemic reptile species in the project area. According to the 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.

Are *Mauremys* , which are partially or largely water-dependent reptile species. *casgica* , *Natrix tessellata* and *Natrix natrix* . 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 , since water is constantly released from the dam to the stream bed for electricity production, these species are currently No negative effects were observed.

The most important reptile data obtained from the field work carried out in the area is the Red-cheeked turtle (*Trachemys scripta*) species was observed in the ponding area in the stream bed under the spillway area. Since the dam area covers a very large area, no species could be observed in this area within a short observation period. It is also useful to observe its presence in the dam area. This species is an invasive species and needs to be observed, monitored and identified as the native species *Mauremys found in the area. casgica* If it threatens the existence of the species in the area and begins to take over the habitats of the natural species, it must be fought. Red-cheeked terrapin (*Trachemys scripta*) is recommended in the Biodiversity action plan.

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

Criterion 1: Refers to Critically Endangered (CR) and /or Endangered (EN) Species. 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** .

1.2.3 Mammals

(*Lynx*) is **one** of the species likely to be distributed in the region. *lynx*) is **listed in the EN category according to** the IUCN Mediterranean assessment. 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 . Many otter feces were seen on the stones in the stream bed continuing from the dam foot. Power plant employees also confirmed the presence of the Otter 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 .

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 areas 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 connection also extends across elevation and climate gradients and across crest-to- coast to coast)” also includes biological corridors.

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. Tercan of HES is located area special One evolutionary period It does not show. The region does not have a special geological structure or a special history and therefore does not contain a large number of critical and/or endemic species. In this regard, the area **does not meet** Criterion 5 .

1.2.4 Ornithology

As a result of the studies, a total of 42 bird species were identified in the project area and its immediate surroundings. The list of these species, their global Red List status, and the status of the species in BERN, CITES and 2022 MAK decisions are given in Table 3 below .

Located around the facility from species 1 of them generation global is under threat on a large scale. This species Lesser Vulture (*Neophron percnopterus*) . Little Vulture (*Neophron percnopterus*) has been identified as "EN" endangered according to IUCN criteria. Birds around the facility 26 of its species are listed in BERN Agreement Annex-2, 7 in BERN Agreement Annex-1 and 6 in CITES Annex-1.

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

Habitats Important to Critically Endangered (CR) or Endangered (EN) Species

Little Vulture (*Neophron percnopterus*) has a global Red List status of “EN” endangered. The species is expected to be seen in the project area during migration and in the spring and summer months corresponding to the breeding season (Kirwan et al., 2008). 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 Spread Species For Important Habitats

Facility birds around This criterion It does not trigger.

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

The Tercan Dam and HEPP facility does not differ significantly from the surrounding region in terms of elevation, moisture gradients , or any other geological, ecological, or evolutionary factor that indicates the region is vital to sustaining unique or distinctive evolutionary processes. Therefore, none of the habitats around the facility trigger Criterion 5.

Table 3 Project in the field Found And Finding Likely Bird Types

Type scientific First Name	Type Turkish name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Accipiter nisus</i>	Eurasian Sparrowhawk	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Actitis hypoleucos</i>	Common Sandpiper	Not Endemic	LC	Annex 2	KD	KD
<i>Aegypius monachus</i>	Bearded Vulture	Not Endemic	LC	Annex 2	KD	KD
<i>Alcedo atthis</i>	Common Kingfisher	Not Endemic	LC	Annex 2	KD	KD
<i>Alectoris chukar</i>	Chukar Partridge	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Anthus campestris</i>	Meadow Pipit	Not Endemic	LC	Annex 2	KD	KD
<i>Ardea purpurea</i>	Purple Heron	Not Endemic	LC	Annex 2	KD	KD
<i>Buteo rufinus</i>	Long-legged Buzzard	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Calidris minuta</i>	Little Stint	Not Endemic	LC	Annex 2	KD	KD
<i>Carduelis carduelis</i>	European Goldfinch	Not Endemic	LC	Annex 2	KD	KD
<i>Chlidonias hybrida</i>	Whiskered Tern	Not Endemic	LC	Annex 2	KD	KD
<i>Chlidonias leucopterus</i>	White-winged Tern	Not Endemic	LC	Annex 2	KD	KD
<i>Ciconia nigra</i>	Black Stork	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Circaetus gallicus</i>	Short-toed Snake Eagle	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Clanga pomarina</i>	Lesser Spotted	Not Endemic	LC	Annex	KD	Annex

	Eagle			2		2
<i>Columba livia</i>	Rock Dove	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Columba palumbus</i>	Common Woodpigeon	Not Endemic	LC	KD	Annex 2	KD
<i>Coracias garrulus</i>	European Roller	Not Endemic	LC	Annex 2	KD	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>Coturnix coturnix</i>	Common Quail	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Curruca communis</i>	Common Whitethroat	Not Endemic	LC	Annex 2	KD	KD
<i>Egretta garzetta</i>	Little Egret	Not Endemic	LC	Annex 2	KD	KD

Type scientific First Name	Type Turkish name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Emberiza calandra</i>	Field Bunting	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Falco subbuteo</i>	Eurasian Hobby	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Fringilla coelebs</i>	Chaffinch	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Galerida cristata</i>	Crested Lark	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Larus armenicus</i>	Armenian Gull	Not Endemic	LC	KD	Annex 1	KD
<i>Linaria cannabina</i>	Linnet	Not Endemic	LC	Annex 2	KD	KD
<i>Motacilla cinerea</i>	Grey Wagtail	Not Endemic	LC	Annex 2	KD	KD
<i>Motacilla flava</i>	Yellow Wagtail	Not Endemic	LC	Annex 2	KD	KD
<i>Nycticorax nycticorax</i>	Black-crowned Night Heron	Not Endemic	LC	Annex 2	KD	KD
<i>Parus major</i>	Great Tit	Not Endemic	LC	Annex 2	KD	KD
<i>Perdix perdix</i>	Common Partridge	Not Endemic	LC	KD	Annex 2	KD
<i>Pica pica</i>	Eurasian Magpie	Not Endemic	LC	KD	Annex 2	KD
<i>Plegadis falcinellus</i>	Glossy Ibis	Not Endemic	LC	Annex 2	KD	KD
<i>Spatula clypeata</i>	Northern Shoveler	Not Endemic	LC	Annex 3	Annex 1	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

1.3 Tercan dam And HEPP facility Effect in the field hydrobiological biodiversity

Definition

The wetlands in the project area have different ecological characteristics. A total of 174 algal taxa belonging to 6 different classes were identified in all areas sampled . Of these, 100 belong to the classes Bacillariophyceae , 29 to Cyanophyceae , 33 to Chlorophyceae , 1 to Chrysophyceae , 7 to Euglenophyceae and 4 to Pyrrophyceae . A total of 29 genera and 100 species belonging to 8 families belonging to the orders Pennales and Centrales of the Bacillariophyceae class have been recorded. Six of these families belong to the order Pennales , and two belong to the order Centrales . In this study, 92 taxa belonging to the order Pennales and 8 species belonging to the order Centrales were recorded.

Naviculaceae stands out as the family with the most genera . 29 taxa belonging to two orders belonging to the Cyanophyceae class have been identified. Of these, Chroococcales While 7 taxa belonging to the order Hormogonales were identified 22 taxa belonging to the order were found.

Chlorophyceae class with 33 taxa belonging to 9 orders has been represented. 11 taxa from these orders Chlorococcales army front next while being found Zygnematales army 8, Desmidiaceae The order comes after with 6 taxa .

A single species belonging to the Chrysophyceae class has been identified. This species Chrysomonadales Dinobryon belonging to the order Sertularia . Euglenophyceae class Euglenales Identification of 7 taxa belonging to the order It carries out. Pyrrophyceae class peridinales to his army connected the one which... 4 The taxon was identified.

the Bacillariophyceae species identified in the study area are cosmopolitan species similar to those identified in many lakes of Turkey.

As a result of the study, a total of 17 species and 5 genera belonging to the Rotifera phylum were identified; A total of 25 zooplankton species, 2 species belonging to Cladocera and 1 species belonging to Copepoda. Taxon determination was made. It was observed that many rotifer species were detected due to the abundance of phytoplanktonic organisms and nutritional salts due to the increasing temperature during the sampling period .

As a result of the identification of invertebrates, a total of 65 taxa were found from three stations. In general, it is noteworthy that members of the order Diptera (20 taxa) and Ephemeroptera (11 taxa) from the Insecta class are dominant in all environments in terms of number of species and population densities. However, Odonata , Coleoptera and Hemiptera army members also high taxon in numbers have been found. Diptera The families Chironomidae from the order and Heptageniidae from the order Ephemeroptera were found to be more dense in terms of the number of species. Chironomidae from the Diptera family is dominant in the mud analyzes of Tuzla Stream and Tercan Dam Lake, especially in stagnant environments .

As a result of fish sampling studies in the project area and its immediate surroundings, a total of 13 fish taxa were caught and identified. 11 of them belong to the Cyprinidae , 1 Salmonidae and 1 Balitoridae family.

Barbus from the identified samples The plebejus species and its subspecies are included in the Annex III list of the international Bern Convention and are among the species that need to be protected. According to the European Red List, 4 species are not evaluated (NE) and all other species are in the low risk (LC) category. No species included in the CITES list have been observed in the project area.

Table 4: Project To the field belonging Alga Types

Class: BACILLORIOPHYCEA
Order : pennales
Family: Achnanthacea
<i>Achnanthes flexella</i> there is. <i>flexella</i>
<i>Achnanthes hungarica</i>
<i>Achnanthes lanceolata</i>
<i>Achnanthes minutissima</i>
<i>cocconeis pediculus</i>
<i>cocconeis placenta</i> there is. <i>euglypta</i>
<i>cocconeis placenta</i> there is. <i>lineata</i>
Family: naviculacea
<i>amphora coffeiformis</i>
<i>amphora commutata</i>
<i>amphora normanii</i>
<i>amphora ovalis</i>
<i>amphora veneta</i>
<i>stauroneis smithii</i>
<i>anomoeoneis sphaerophora</i>
<i>anomoeoneis sphaerophora</i> there is. <i>costata</i>
<i>caloneis alpestris</i>
<i>caloneis bacillum</i>
<i>caloneis permagna</i>
<i>caloneis schumanniana</i>
<i>Cymbella affinis</i>
<i>Cymbella caespitosa</i>
<i>Cymbella cistula</i>
<i>Cymbella cymbiformis</i>
<i>Cymbella helvetica</i>
<i>Cymbella lanceolata</i>
<i>Cymbella prostrata</i>
<i>Diploneis ovalis</i>
<i>gomphonema acuminatum</i>
<i>gomphonema angustatum</i>
<i>gomphonema angustum</i>
<i>gomphonema gracile</i>
<i>gomphonema olivaceum</i>
<i>gomphonema parvalum</i>
<i>gomphonema pseudoaugur</i>
<i>gomphonema truncatum</i>
<i>gyrosigma acuminatum</i>
<i>gyrosigma attenuatum</i>
<i>Navicula capitatoradiata</i>
<i>Navicula cincta</i>
<i>Navicula cryptocephala</i>
<i>Navicula cuspidata</i>
<i>Navicula gracilis</i>
<i>Navicula nivalis</i>
<i>Navicula oblonga</i>
<i>Navicula pupula</i>
<i>Navicula pygmaea</i>

<i>Navicula radiosa</i>
<i>Navicula rhyncocephala</i>
<i>Navicula tuscula</i>
<i>Navucila bacillum</i>
<i>neidium affine</i>
<i>neidium dubium</i>
<i>pinnularia borealis</i>
<i>pinnularia microstauron</i>
<i>Rhoicosphenia abbreviata</i>
Family: Epithemiacea
<i>denticula elegance</i>
<i>denticula kuetzingii</i>
<i>Epithemia Argus</i>
<i>Epithemia sorex</i>
<i>Rhopalodia constricta</i>
<i>Rhopalodia gibba</i>
Family: Bacillariacea
<i>Bacillaria paradoxa</i>
<i>hantzschia amphioxys</i>
<i>Nitzschia amphibia</i>
<i>Nitzschia constricta</i>
<i>Nitzschia dissipate</i>
<i>Nitzschia gracilis</i>
<i>Nitzschia hantschiana</i>
<i>Nitzschia hungarica</i>
<i>Nitzschia linearis</i>
<i>Nitzschia obtusa</i>
<i>Nitzschia palea</i>
<i>Nitzschia sigmoidea</i>
<i>Nitzschia tryblionella</i>
Family: surirellacea
<i>Cymatopleura elliptica</i>
<i>Cymatopleura solea</i>
<i>surirella angusta</i>
<i>surirella brebissonii</i>
<i>surirella brightwelli</i>
<i>surirella ovalis</i>
Family: Fragilariacea
<i>diatom hiemala</i>
<i>diatom tenuis</i>
<i>diatom vulgaris</i>
<i>Fragilaria capucina</i>
<i>Fragilaria contruens</i>
<i>Fragilaria crotonensis</i>
<i>Fragilaria dilatata</i>
<i>Fragilaria parasitica</i>
<i>Fragilaria pulchella</i>
<i>Fragilaria ulna</i>
<i>Fragilaria vaucheria</i>
<i>meridion circulare</i>
Order : centrales
Family: Melosiraceae

<i>Melosira varians</i>
Family: Thalassiosiraceae
<i>aulacoseira granulate</i>
<i>aulacoseira ambigua</i>
<i>cyclotella comta</i>
<i>cyclotella kützingiana</i>
<i>cyclotella meneghiniana</i>
<i>cyclotella ocellata</i>
<i>stephanodiscus astrea</i>
Class: CYANOPHYCEA
Order : Chroococcales
<i>Chroococcus minutus</i>
<i>Chroococcus turgidus</i>
<i>gomphosphaeria aponina</i>
<i>Merismopedia elegance</i>
<i>Merismopedia glauca</i>
<i>Merismopedia punctate</i>
<i>microcystis aeruginosa</i>
Order : Hormogonales
<i>anabaena komvophoron</i>
<i>anabaena spiroides</i>
<i>calothrix epiphytica</i>
<i>calothrix fusca</i>
<i>Lynbya aestuarii</i>
<i>Lynbya hieronymusii</i>
<i>nostoc commune</i>
<i>Oscillatoria agardhii</i>
<i>Oscillatoria brevis</i>
<i>Oscillatoria formosa</i>
<i>Oscillatoria imnetica</i>
<i>Oscillatoria limosa</i>
<i>Oscillatoria rubescens</i>
<i>Oscillatoria subbrevis</i>
<i>Oscillatoria tenuis</i>
<i>spirulina laxissima</i>
<i>spirulina major</i>
<i>spirulina sp.</i>
<i>Phormidium mucicola</i>
<i>Schizothrix natans</i>
<i>Gloeotrichia echinulata</i>
Class: CHLOROPHYCEA
Order : Volvocales
<i>Chlamydomonas globosa</i>
<i>Gonium pectoral</i>
Order : Tetrasporales
<i>Gloeocystis sp.</i>
Ordo ; ulothrichales
<i>ulothrix subconstricta</i>
Order : Microsporales

<i>Microspora stagnorum</i>
Ordo ; Cladophorales
<i>Cladophora fracta</i>
<i>Cladophora glomerata</i>
Order : oedogoniales
<i>oedogonium sociale</i>
Order : chlorococcales
<i>Ankistrodesmus falcatus</i>
<i>coelastrum microporum</i>
<i>oocystic borgei</i>
<i>oocystic Crassa</i>
<i>Pediastrum borianum</i>
<i>Pediastrum duplex</i>
<i>Pediastrum simplex</i>
<i>Scenedesmus acuminatus</i>
<i>Scenedesmus ecornis</i>
<i>Scenedesmus in quadricau</i>
<i>tetrahedron minimum</i>
Order : Zygnematales
<i>Mougeotia sp.</i>
<i>Spirogyra circumlineata</i>
<i>Spirogyra dubia</i>
<i>Spirogyra sp. one</i>
<i>Spirogyra sp. 2</i>
<i>Spirogyra sp. 3</i>
<i>Zygnema ericetorum</i>
<i>Zygnema sp.</i>
Order : Desmidiales
<i>Closterium diana</i>
<i>Closterium lunula</i>
<i>cosmarium botrystis</i>
<i>cosmarium garnet</i>
<i>cosmarium margaritatum</i>
<i>staurodesmus sp.</i>
Class: CHRYSOPHYCEA
Order : Chrysomonadales
<i>Dinobryon sertularia</i>
Class: EUGLENOPHYCEA
Order : Euglenales
<i>Euglena acus</i>
<i>Euglena oxyrus</i>
<i>Euglena polymorpha</i>
<i>Phacus in curvica</i>
<i>Phacus orbicularis</i>
<i>Phacus radícula</i>
<i>trachelomonas sp.</i>
Class: PYRROPHYCEAE
Order : peridinales

<i>ceratium hirundinella</i>
<i>glenodinium sp.</i>
<i>peridinium cinctum</i>
<i>peridinium sp.</i>

Table5: Project To the field belonging zooplanktonic Types

ROTIFERA
<i>brachionus patulus</i>
<i>colurella colurus</i>
<i>colurella uncinata</i>
<i>colurella adriatica</i>
<i>colurella obtusa</i>
<i>cephalodella gibba</i>
<i>cephalodella catellina</i>
<i>cephalodella ventripes</i>
<i>cephalodella Tenuior</i>
<i>cephalodella sp</i>
<i>Dissotrocha sp.</i>
<i>Euchlanis sp.</i>
<i>keratella tecta</i>
<i>Lecane hamata</i>
<i>lepadella patella</i>
<i>lepadella quadricarinata</i>
<i>lepadella sp.</i>
<i>Lindia sp.</i>
<i>polyarthra remata</i>
<i>proales theodora</i>
<i>proales fallaciosa</i>
<i>philodina megalotrocha</i>
<i>Bedelloid rotifer</i>
CLADOCERA
<i>Moina sp.</i>
<i>Alona rectangular</i>
IN COPEPO
<i>cyclops sp.</i>
<i>Nauplius</i>

Table 6: Project To the field benthic organisms

Branch: ANNELIDA
Class: CLITELLATA
Set: HIRUDINEA
Family: Erpobdellidae
<i>Erpobdella sp.</i>
Class: OLIGOCHAETA
Set: LUMBRICULIDAE
<i>Lumbriculus variegatus</i> (Müller , 1774)
Set: TUBIFICIDA
Family: tubificidae
<i>tubifex tubifex</i> (Müller,1774)
<i>limnodrilus udekemianus</i> Claparède , 1862
<i>potamotheix hammoniensis</i> (Michaelsen , 1901)
Family: Naididae
<i>Nais communis</i> Piguet , 1906
<i>Nais variabilis</i> Piguet , 1906
<i>Nais elinguis</i> Müller , 1773
<i>Pristinella jenkinsi</i> (Stephenson , 1931)
Branch: ARTHROPODA
Class: CRUSTACEA
Set: AMPHIPODA
Family: Gammaridae
<i>gammarus pulex</i>
Set: IN DECAPO
Family: Oniscidae
<i>Potamon sp.</i>
Class: INSECTA
Set: HEMIPTERA
Family: Corixidae (nymph)
<i>Micronecta sp.</i>
Family: Hydrometridae
<i>hydrometra sp.</i>
Family:Corixidae
<i>Corixa sp.</i>
Family:Gerridae
<i>Geris sp.</i>
Family:Notonectidae
<i>notonecta sp.</i>

Table 7: Tercan Tea I Fish Types And Protection Status

Family	Type And subspecies	Turkish First Name	endemism	BERN	IUCN	CITES	natural kind	exotic species
Salmonidae	<i>Oncorhynchus mykiss</i> (Walbaum, 1792)	Rainbow Trout	-	-	WHA T	-	X	-
Cyprinidae	<i>Alburnoides eichwaldi</i>	Dotted Barbel	-	-	LC	-	X	-
	<i>Acanthobrama marmid</i> Heckel, 1843	Wood Barbel	-	-	LC	-	X	-
	<i>Barbus plebejus</i>	Common Barbel	-	Additional III	LC	-	X	-
	<i>Luciobarbus mystaceus</i>	Mustached Barbel	-	-	WHA T	-	X	-
	<i>Alburnus mossulensis</i> Heckel, 1843	Mosul Barbel	-	-	WHA T	-	X	-
	<i>Capoeta capoeta</i>	Capoeta	-	-	WHA T	-	X	-
	<i>Capoeta trutta</i> (Heckel, 1843)	Brown Trout	-	-	LC	-	X	-
	<i>Cyprinion macrostomum</i>	Big-mouthed Barbel	-	-	LC	-	X	-
	<i>Chondrostoma regime</i> (Heckel, 1843)	Karaburun Barbel	-		LC		X	-
	<i>Garra rufa</i> (Heckel, 1843)	Doctor Fish	-		LC		X	-
	<i>Squalius cephalus</i> (L., 1758)	Common Chub	-		LC		X	-
Balitoridae	<i>Xynoemacheilus argyrogramma</i>	Scavenger Fish	-		LC		X	-

1.4 Biodiversity Risk Evaluation

1.4.1 Flora

of the project's Area of Analysis (AoA), CR, EN and VU types (VU types likely to trigger Criterion 1b) has been developed based on baseline data. In this context, critical flora species have been identified around the project area, and the critical habitats determined in the project area are given in Table 2. made As a result of the studies, 7 critical species were identified in the project area and its surroundings (Table 2). All of these species have EN Status. In this context, the habitats where these species occur have been determined as critical habitats, and information about critical habitats is given in Table 8.

Table 8: IFC In the scope of Critical Type And habitat Evaluation

Critical Herb taxa	Turkish First Name	Critical habitats
<i>Bellevalia crassa</i>	Virgo Hyacinth	H3
<i>Hesperis breviscapa</i>	Highland Eveningstar	H3
<i>Reseda tomentosa</i> var. <i>glabrata</i>	Towel Necklace	H5
<i>Sonchus erzincanicus</i>	Sorrel	C1.2
<i>Thymus convolutus</i>	Bend Down Thyme	H3
<i>Trigonosciadium intermedium</i>	Sapphirewort	H3
<i>Verbascum leiocarpum</i>	Robust Mullein	H3

➤ 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.

of the project effect in the field invader flora types detection (Table 3.10). biodiversity Action
The 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, in order 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.

Table9: Project in the field Found Invader Species

<i>Acer negundo</i> (ash tree leafy maple) Areas open to andropogenic influence	
<i>agropyron repens</i> (Separate herb) Field, open area	

<i>ailanthus altissima</i> (Kokarağaç) andropogenic to the effect open spaces		
<i>amaranthus retroflexus</i> (Fox dry) Field, open area		
<i>Boreava orientalis</i> (Sariat) Field, roadside		
<i>chenopodium album</i> (While crying) Flood, flood bearings		
<i>Cirsium arvense</i> (Köygöçüren) Flood, flood bearings		

<i>conyza canadensis</i> (cypress) andropogenic to the effect open fields	
<i>conyza bonariensis</i> (Coyote) andropogenic to the effect open spaces	
<i>conyza albida</i> (Maplewort) andropogenic to the effect open spaces	
<i>Cuscuta campestris</i> (Turkish) meadow-pasture habitats	

<i>Lepidium draba</i> (Diġnik) andropogenic to the effect open spaces	
<i>nasturtium officinale</i> (Suteresi) streamside	
<i>Reseda lutea</i> (Love flower) Path edge, field	
<i>rumex acetocella</i> (Sorrel) Path edge, field And barren places	

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

<i>paspalum distichum</i> (This discrete) This communities inside on channels		
<i>Robinia pseudoacacia</i> (White flowering liar acacia) roadsides		
<i>xanthium strumarium</i> (Big Pitrak) Flood, flood bearings		
<i>xanthium spinosum</i> (Yellow Pitrak) Flood, flood bearings		

Viscum album (Lime herb) to the trees interference



1.4.2 Fauna

IFC PS-6 and Guidance Taking into account the Note 6 criteria, the "critical species" evaluation and "critical habitat" evaluation were made in section 4.5 , and there is no Critical species in terms of fauna (Amphibia, Reptile, Mammal) in the region, and accordingly, there is no critical habitat .

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.

Lynx Risk assessment for 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 was determined by us and confirmed by project staff. There are plenty of fish in the stream bed after the dam and a very suitable area for otter feeding has been created. has been observed. This connected aspect in in the field This in your bed of rocks on plenty of

Otter droppings have been observed. No threat to the species has been observed. It would be beneficial for the species to reduce human activity and never fish in the ponded water bed below the Spillway outlet , which is understood to be frequently used by the otter . These issues are detailed in the Biodiversity Action Plan.

Red-cheeked terrapin (*Trachemys scripta*) species : This species is a commercial species brought to Turkey through animal trade and sold in pets. However owners watery due to leaving it to the fields Turkey's various It started to be observed in water resources in the regions. It is an invasive and alien species. There is a risk of competing with similar natural species in the water resources where they are released and taking over their habitats, reducing the amount of natural native species or removing them from the environment. In this regard, it is necessary to monitor this invasive species in the field and reveal the extent of the risk it will pose. These issues are detailed in the Biodiversity Action Plan.

1.4.3 Ornithology

IFC PS-6 and Guidance Taking into account the Note 6 criteria, the “critical species” evaluation and “critical habitat” evaluation were made in section 4.5 , and there are Critical species in terms of birds in the region. This species is the Lesser Vulture (*Neophron percnopterus*) . Attention should be paid to the actions provided in the Biodiversity Action Plan for the species in question.

Moreover facility around percolator other some bird species also detection has been And This species There is a risk of collision with transmission lines. Some of these species include the red hawk (*Buteo rufinus*) and the lesser forest eagle (*Clanga pomarina*) . valley of the facility Its location at the base reduces the risk of soaring bird collisions with electrical transmission lines in the facility (Hanssen et al., 2020). of the facility By reducing the water flow of itself and the regulator, it directly affects the birds that live directly connected to the stream and the riverside, riparian habitats. Some of these species include the ostrich (*Cinclus cinclus*), white wagtail (*Motacilla alba*) and mountain wagtail (*Motacilla cinerea*). For this reason, it is of great importance for the bird species living in the region between the regulator and the HEPP to have sufficient amounts of living water at all times. Necessary determinations must be made on this issue and, if necessary, measures must be taken according to the results (see Biodiversity Action Plan). Apart from this, the facility does not have a direct negative impact on bird diversity and populations.

1.4.4 hydrobiology

There are no intensive fishing activities in the region. Domestic and industrial pollution sources of residential areas in the upper basin of Tercan significantly threaten the existence and density of fish species. These species are widespread and abundant in the inland waters of all Anatolia.

Rivers are complex and dynamic ecosystems. By changing these areas, lotic species will be affected and reduced by the loss of breeding grounds along with significant environmental change. River species normally live and spawn in shallow places and look for such habitats after the formation of the dam lake. If they cannot find it, they face losing competition with other lentic species due to the difference in their ecological niches. After the formation of such areas in HEPP-like applications, areas where some species can live should also be protected. Aquatic species; It adapts to the living conditions in a particular river section and creates characteristic biocoenoses shaped by the change of abiotic factors along the stream (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.

invasive algae, zooplankton , benthic organisms or fish species were found in Tercan HEPP and surrounding areas. Social responsibility projects and biodiversity action plans are important at this point.

1.4.5 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,
- weather 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. The 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. Regarding the issue dated 26.06.2021 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	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;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. 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".
		Medical Wastes	For medical waste generated within the scope of the activity; waste at the source -most member will download system establishment 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, 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.
		Waste Electronic Things	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.
		Waste oils	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

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 06.06.2015 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 It is collected in the septic tank and it has been determined that it is disposed of by using a sewer 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.

1.5 Biodiversity Action plan

Tercan dam And HEPP facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
T1	Critical Habitats	Critical Habitat Protection	Critical Habitats (H3, H5, C1.2)	Project Effect Area It should be protected because it contains habitats that have not lost their naturalness and contain critical flora species.	Tree segments of Prevention, Not Throwing Waste or Residual Materials, Not Lighting Fires, Preventing Dust Emission from Vehicles and Raising Awareness with Warning Signs Your studies to be done	During Operation	During Operation
T2	Critical Habitats	Critical Conservation of Plant Species	(H3, H5, C1.2)	Endangered Flora types Research should be conducted in the Project Area and its surroundings	Population by Expert Biologists Level Monitoring	During Operation	Between March and November Each Moon 3 Days, Total 27 Days 5 Years Population Views And mapping
T3	All Habitats	Critical Conservation of Fauna Species	General Area	Endangered Fauna types His research particularly focused on the Lesser Vulture (<i>Neophron Percnopterus</i>) Type in Project Area and Surroundings It should be investigated	Population by Expert Biologists Level Monitoring	During Operation	2 Year Duration: March- November Between

T4	All Habitats	Critical Conservation of Fauna Species	General Area	Red-cheeked terrapin <i>Trachemys scripta</i> And <i>mauremys caspica</i> Project Area of Types and Around It should be investigated	Population by Expert Biologists Level Monitoring	During Operation	2 Year Duration: June-July

Tercan dam And HEPP facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
T5	Business	Fauna Conservation of Species	Project Area And surroundings	Tortoise (<i>Testudo</i> Facility Employees Should Be Provided Training About <i>Graeca</i>) Species. Pay Attention to Certain Points of the Project Area Tortoise may come out signs It must be placed.	Biologists who are experts on the subject Training Should Be Provided by	During Operation	April-May 2024 one Times
T6	Business	Fauna Conservation of Species	Project Area And surroundings	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
T7	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.	Population by Expert Biologists At the level Tracing	During Operation	2024 Year September Bear 1 Time
T8	Business	Fauna Conservation of Species	Project Area And surroundings	Lynx About the Lynx) Species Facility Employees Should Be Provided Training	Biologists who are experts on the subject Training Should Be Provided by	During Operation	April-May 2024

Tercan dam And HEPP facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
T9	Business	Fauna Conservation of Species	Project Area And surroundings	Bear (<i>Ursus</i>) in the area <i>arctos</i>) is available. Human-bear encounters can sometimes be dangerous. In order not to attract bears to the area, there are no open areas in the facility. Garbage containing food should never be left behind. A trash management plan should be prepared and information on how to store and remove trash that might attract bears should be prepared. The application must be reported.	Company By	During Operation	Continually
T10	Business	Fauna Conservation of Species	Project Area And surroundings	Pet Cats Should Never Be Kept in the Facility. Although it is recommended not to keep a pet dog, even if it is kept, it may be dangerous, especially at night. Free to their wanderings Permission should not be given	Company By	During Operation	April-May 2024
T11	All Habitats	Invader Blocking Species	Project Area And surroundings	Especially <i>Ailanthus</i> in the Project Area and Surroundings <i>altissima</i> Invasive Species Investigating Project Area and Surroundings by watching dismantling Plan Must Be Prepared	Population by Expert Biologists Level Monitoring	During Operation	one Year Duration in July and August

Tercan dam And HEPP facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
T12	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
T13	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
T14	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
T15	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

T16	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	

BEYKÖY REGULATOR AND HEPP FACILITY BIODIVERSITY ACTION PLAN

1.1 Entrance

Beyköy Hydroelectric Power Plant (HES) is located on the Sakarya River in the Sarıcakaya district of Eskişehir. The power plant, owned by Zorlu Enerji, has an installed capacity of 16.80 MWe, making it the 622nd largest power plant in Turkey and the 6th largest in Eskişehir. The plant is also the 259th largest hydroelectric power plant in Turkey.

Beyköy HES generates an average of 48,441,458 kilowatt-hours of electricity, which can meet all the electricity needs (housing, industry, metro transportation, public offices, street lighting, etc.) of approximately 13,337 people in their daily lives. When considering only residential electricity consumption, Beyköy HES can produce enough electricity to meet the needs of 16,217 homes.

The project area is located approximately 1.9 km away from Laçın village in a straight line. Additionally, the site is about 1.2 km from Düköy village, 2.1 km from Yenice village, 4.4 km from Kuzucular village, 10.4 km from Osmanköy village, 12.8 km from Kavakköy village, 6.8 km from Alapınar village, 8.1 km from Çamalan village, 4.6 km from Tekirler village, 12 km from Dağküplü village, 4.7 km from Kapıkaya village, 7.9 km from Mayıslar village, 9.6 km from Iğdır village, 11.3 km from Sarıcakaya village, 16.3 km from Yukarıçaylı village, 17.1 km from Aşağıçaylı village, and 10.3 km from Beyyayla village (Figures 1 – 5).

There are significant wetland areas surrounding the project site. In addition to being located on the Sakarya River, the project site is approximately 3.1 km from Yenice Dam, 14.7 km from Gökçekaya Dam, 10.9 km from Çamalan Pond, and 11.4 km from Hamamboğazı Stream in a straight line. Additionally, there are numerous small ponds in the vicinity (Figures 6 – 8).



Shape one Project to the field belonging Satellite image

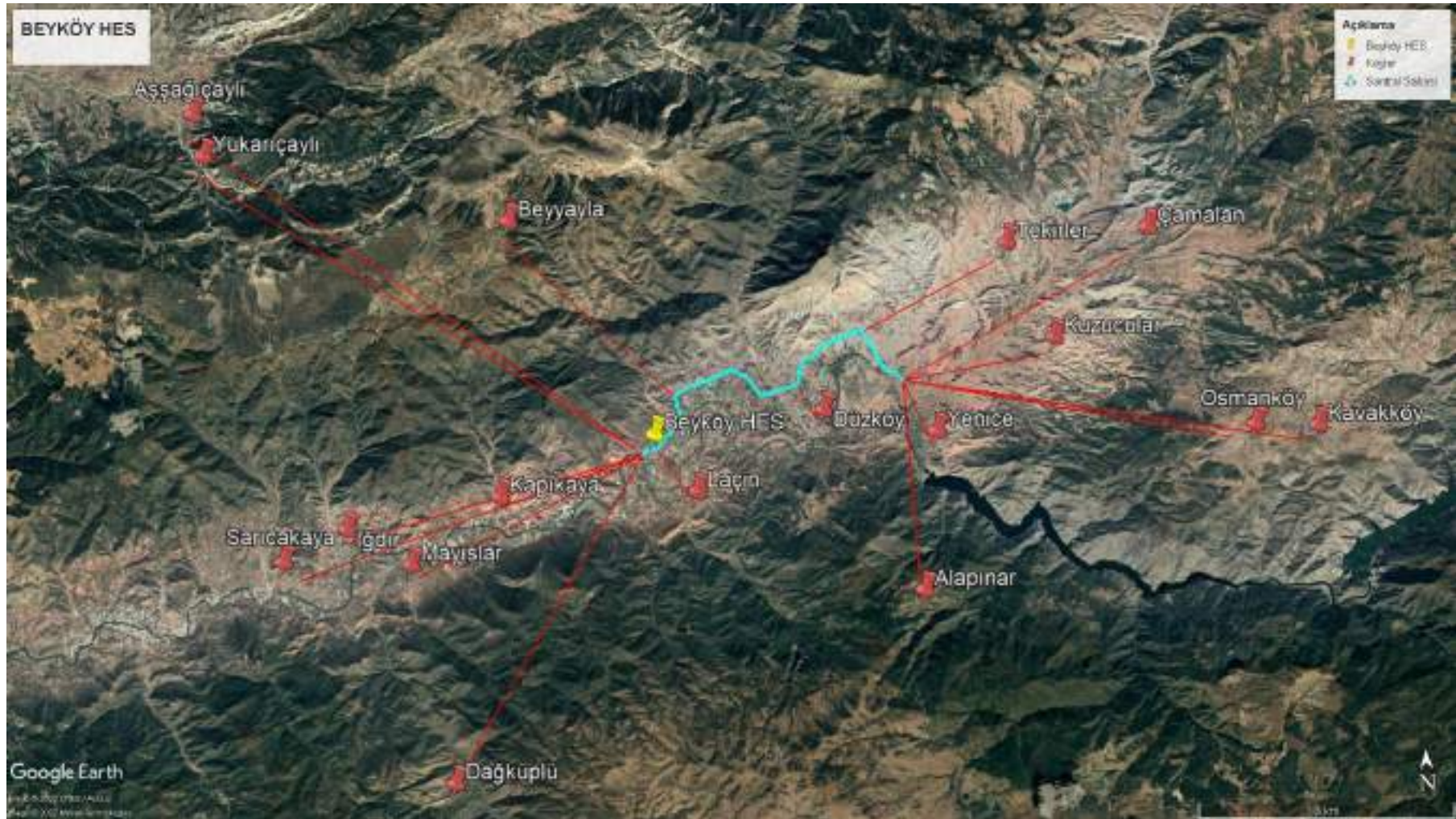


Figure 2: Settlements of Villages (Neighborhoods) in the Vicinity of the Project Area



Figure 3 Settlements of Villages (Neighborhoods) in the Vicinity of the Project Area

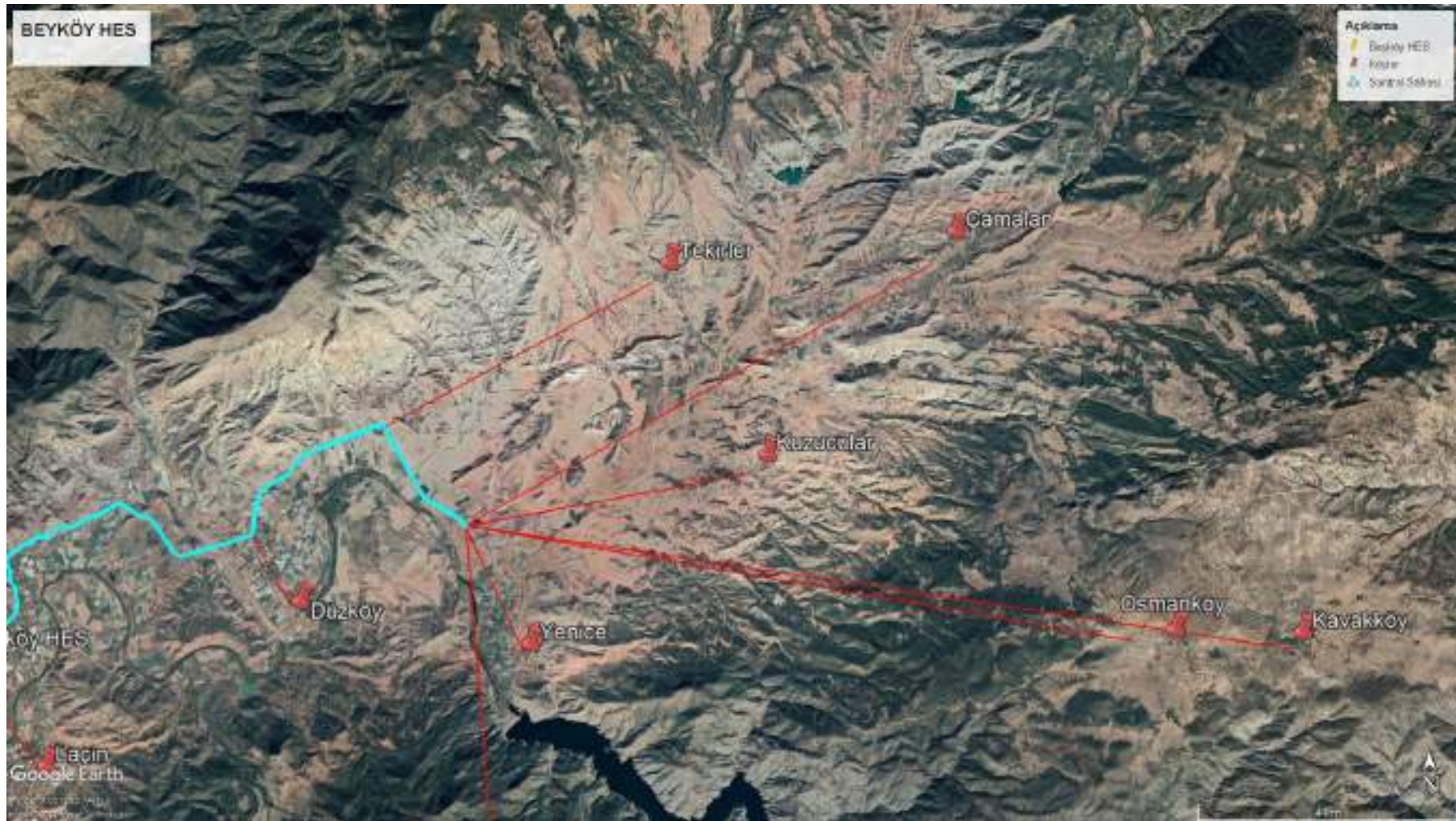


Figure 4: Village (Neighborhood) Settlements in the Vicinity of the Project Site.



Figure 5: Village (Neighborhood) Settlements in the Vicinity of the Project Site

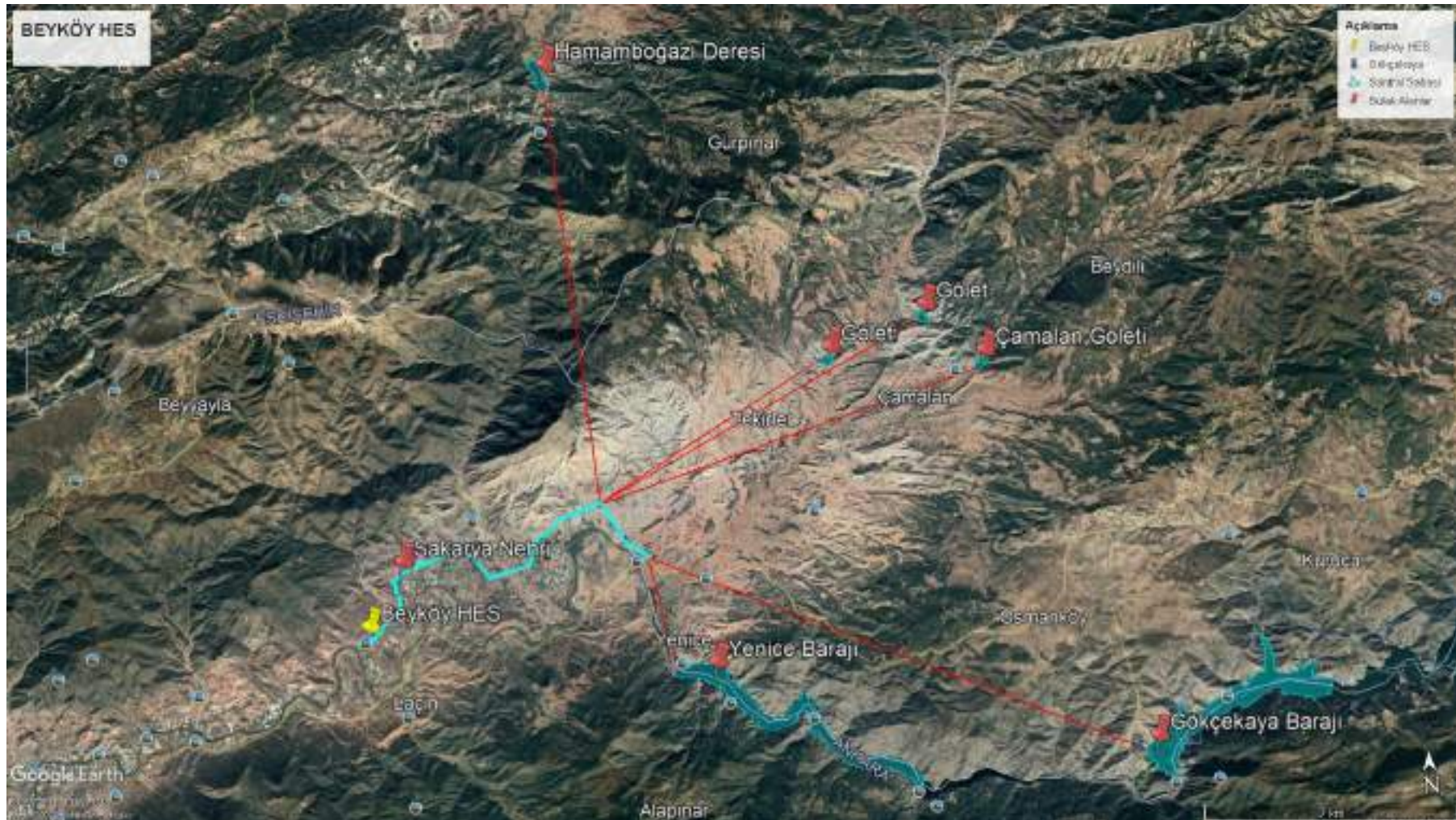


Figure 6: Significant Water Bodies Surrounding the Project Area



Figure 8: Significant Water Bodies Surrounding the Project Area

1.2 Relationship of the Area with Protected and Special Status Areas:

Considering the position of Beyköy HPP site in relation to the surrounding protected areas, there is an approximate 1.4 km distance between the Sundiken Mountains Key Biodiversity Area (KBA) boundary and the outer boundary of the plant site (Figure 9).



Figure 9: Satellite Image Showing the Relationship Between the Project Site and Protected Areas.

1.3 Identification and Classification of Habitats within the Impact Area of Beyköy Regulator and HPP Facility:

The “Beyköy Regulator and Hydroelectric Power Plant (HPP) project” is operated by Zorlu Doğal Elektrik Üretimi A.Ş., located on the Sakarya River in the Sarıcakaya district of Eskişehir.

There are 10 different habitat types within the project area. Of these habitats, 6 are natural, and the remaining 4 are modified habitats. The types of vegetation that develop in natural areas are characterized by their vegetation types according to Level 3 and Level 2 codes in the EUNIS Habitat Classification (Figure 10).

**Beyköy HES EUNIS
Habitat Haritası**

Ölçek: 1:6,000



- ** Tesis binaları
- * C2.2: Mevsimsel olmayan, hızlı akan akarsular
- * E3: Mevsimsel ıslak çayırlar, ıslak çayırlar
- * G1: Yaprak döken ormanlar
- * G3: Herdem yeşil iğne yapraklı ormanlar
- * G5: Antropojenik ormanlar, baltalıklar, ağaç sıraları
- * H5: Bitki örtüsü seyrek açık alanlar
- ** I1.3: Yoğun olmayan tarımsal yöntemlerle yetiştirilen ürünlerin olduğu ekili alanlar
- ** J4.2: Yol ağları
- ** J4.6: Kaldırımlar, beton yüzeyler, rekreasyon alanları
- ** J5.41: İnsan yapımı tatlı su kanalları



0 125 250
Meters

Figure 10: Beyköy HES EUNIS Habitat Map.

➤ **Natural habitats**

C2.2 Non-seasonal Fast-flowing Rivers

At an elevation of 220 meters near the facility, the subspecies *Cirsium arvense vestitum* is present in this habitat; observed species include *Potentilla reptans*, *Sanguisorba minor* subspecies *lasiocarpa*, *Periploca graeca* variety *graeca*, *Convolvulus lineatus*, *Symphytum orientale*, *Scutellaria hastifolia*, *Lamium purpureum* variety *purpureum*, *Nepeta italica* subspecies *italica*, *Prunella vulgaris*, *Mentha aquatica*, *Mentha longifolia* subspecies *typhoides* variety *typhoides*, *Gonilimonium incanum*, *Salix alba*, *Galium rivale*, *Galium verum* subspecies *verum*, and *Hordeum geniculatum*.



Photos 1: Non-seasonal Fast-flowing Rivers (EUNIS: J2.2)

E3 Seasonal Wet meadows, Wet streams

In this habitat observed at an elevation of 220 meters around the facility, the following plant taxa have been identified: *Ranunculus constantinopolitanus*, *Sanguisorba minor* subspecies *lasiocarpa*, *Anthemis triumfettii*, *Tripleurospermum sevanense*, *Centaurea thirkei*, *Cichorium intybus*, *Scorzonera cana* variety *cana*, *Hieracium pannosum*, *Campanula olympica*, *Campanula rapunculus* variety *rapunculus*, *Cynoglossum montanum*, *Verbascum georgicum*, *Veronica gentianoides* subspecies *gentianoides*, *Veronica serpyllifolia*, *Teucrium orientale* variety *orientale*, *Nepeta nuda* subspecies *nuda*, *Prunella laciniata*, *Salvia virgata*, *Plantago maritima*, *Plantago lanceolata*, *Asparagus tenuifolius*, *Asphodeline damascena* subspecies *damascena*, and *Allium atrovioleaceum*.

G1 Deciduous Forests

Starting at an elevation of 250 meters, the plant taxa identified in this habitat include: *Dorycnium graecum*, *Pyrus elaeagnifolia* subspecies *elaeagnifolia*, *Periploca graeca* variety *graeca*, *Veronica chamaedrys*, *Veronica officinalis*, *Prunella laciniata*, *Salvia sclarea*, *Aristolochia bodamae*, *Corylus columna*, *Asperula involucrata*, *Galium odoratum*, *Carex distans*, and *Phleum pratense*.



Photos: 2 Deciduous Forests (EUNIS: G1)

G3 Evergreen Needle Leaf Forests

In this habitat, starting at an elevation of 220 meters, the following plant taxa have been identified: *Pinus sylvestris*, *Pyrus elaeagnifolia* subspecies *elaeagnifolia*, *Salvia sclarea*, *Carex distans*, *Dorycnium graecum*, *Prunella laciniata*, *Lotus corniculatus* variety *alpinus*, *Helichrysum graveolens*, *Anthemis aciphylla* variety *aciphylla*, *Tanacetum poteriifolium*, *Carduus pycnocephalus* subspecies *albidus*, *Crupina crupinastrum*, *Crepis foetida* subspecies *commutata*, *Legousia speculum-veneris*, *Moneses uniflora*, *Pinus nigra*.



Photos 3: Evergreen Needle Leaf Forests (EUNIS: G3)

G5 Anthropogenic Forests, Coppice Forests

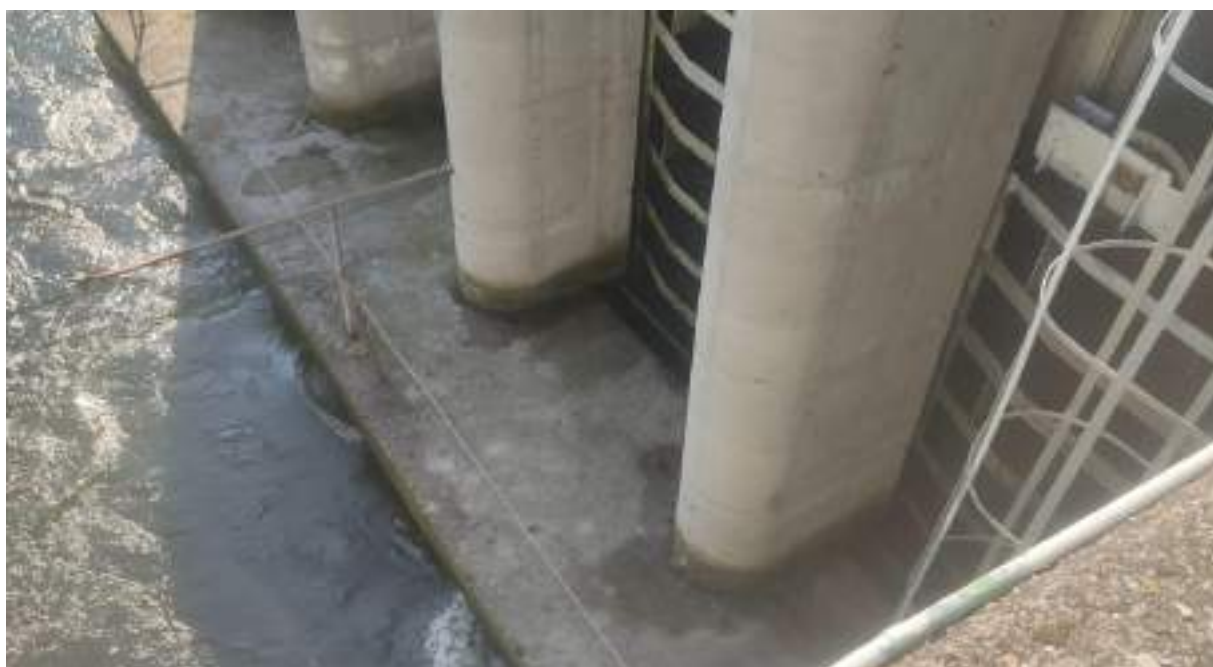
This habitat, beginning at an elevation of 230 meters and spreading into G1 and G3 habitats, consists of a mixture of plant taxa found nearby the facility.

H5 Sparse Vegetation Clearings

At an elevation of 230 meters at the facility, the following plant taxa have been identified: *Ranunculus isthmicus* subspecies *stepporum*, *Brassica elongata*, *Crambe tataria* variety *tataria*, *Isatis glauca* subspecies *glauca*, *Fumana aciphylla*, *Polygala pruinosa* subspecies *pruinosa*, *Silene dichotoma* subspecies *sibthorpiana*, *Echinophora tournefortii*, *Scandix australis* subspecies *grandiflora*, *Inula montbretiana*, *Anthemis tinctoria* variety *pallida*, *Achillea wilhelmsii*, *Gundelia tournefortii* variety *tournefortii*, *Onopordum turcicum*, *Centaurea coronopifolia*, *Centaurea pichleri* subspecies *pichleri*, *Crupina crupinastrum*, *Scorzonera laciniata* subspecies *laciniata*, *Crepis sancta*, *Phlomis pungens* variety *hirta*, *Sideritis montana* subspecies *montana*.

➤ Modified Habitats

Areas with habitat codes J4.2, J42, J6.1 are characterized by concrete, chemical water, and asphalt and lack floral content. However, the cleaning of seeds germinating in cracks in these structures is important for the integrity of the system. In habitats coded J4.6 and I.1.3, care should be taken that the plants used for landscaping and food purposes are not invasive species.



Photos 4: Actively Used Industrial Structures in Rural Areas (EUNIS: J2.3)



Photos 5: Road Networks with Sidewalks and Recreational Areas (EUNIS: J4.2 and J4.6)



Photos 6: Man-made Freshwater Channels (EUNIS: J41)



Photos 7: Cultivated Fields with Crops Grown Using Low-Intensity Agricultural Methods (EUNIS: I1.3)

When examining the vegetation of the project site and its surroundings, a large part is comprised of natural deciduous, coniferous, or mixed forest areas that are susceptible to anthropogenic effects, along with human-shaped fruit orchards and streambed habitats.

➤ **Aquatic Habitats**

The degradation and reduction of habitats in aquatic ecosystems are increasing day by day due to anthropogenic activities and climate change. Interventions in the water regime, deterioration of water quality, illegal fishing, and uncontrolled activities are harming aquatic life and their surrounding habitats. Understanding and managing the impact of human activities on aquatic ecosystems is crucial. Having knowledge of the spatial distribution of habitats and mapping them is essential for effective management.

In the classification of aquatic habitats in the area, the most current version of the EUNIS Habitat Classification has been used, providing a method that allows a broader analysis of habitats in relation to ecological regions, climate, soil, and environmental pressures. This classification method not only facilitates data comparison with other countries but also organizes the system into 10 main categories and their subcategories according to a standardized terminology.

The investigations conducted in the Beyköy HES area have not identified any particular habitat type. Semi-natural habitats are noticeable in the regulator and power plant areas, while other sections follow the natural habitat structure along the streams. In the area, fishes that feed on algae, zooplankton, or benthic organisms are at the top of the aquatic food chain. Fish habitats observed in the Beyköy HES area are listed in Table 1.

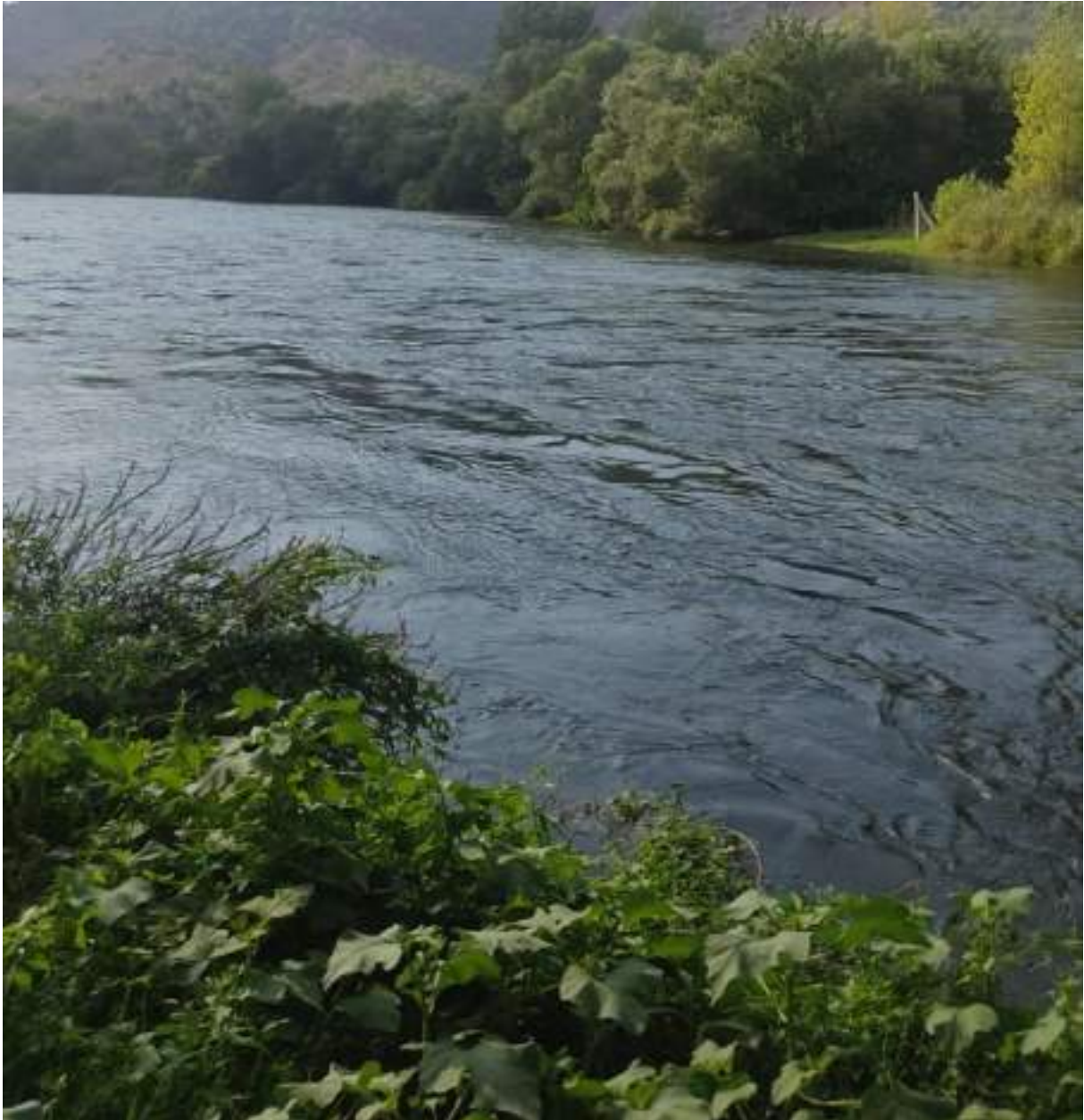
Table1: Beyköy HEPP aquatic habitat And Features

EUNIS CODE	HABITAT NAME	FEATURES	RAID SPECIES
C2	surface streams	in the field Other Continuous 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 the hornbill (<i>Chondrostoma regium</i>), fresh water mullet (<i>Squalius cephalus</i>) type diversity more is too much.

The stream bed generally looks like a natural habitat (Photo 9). Degraded habitat structures around Beyköy HEPP have adapted to the natural environment since there has been no external influence so far.



Photos 8: Beykoy HEPP in the field Exit juice around Semi-Natural habitat Structure



Photos 9: Project Area Natural habitat Structure

1.2 Beyköy regulator And HEPP facility Effect in the field floristic biodiversity

Definition

IFC PS-6 and Guidance in the facility area No plant taxon with CR and EN status that complies with Note 6 criteria was found. Therefore, there is no critical habitat supporting these taxa . Apart from the coppice tree communities whose cover has been broken by human influence, there are reeds, reeds and willows in non-seasonal, fast-flowing stream beds.

1.3 Beyköy regulator And HEPP facility Effect in the field faunistic biodiversity

Definition

1.3.1 Amphibian

Project in the field generation in danger One amphibian There is no type .

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.

1.3.2 Reptiles

There are no endemic reptile species in the project area. According to the 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.

Apart from this, there is no endangered or endemic reptile species in the project area .

are *Natrix* , which are partially or largely water-dependent reptile species. *tessellata* and *Natrix natrix* . The impact of these species may be due to the decrease in water in the stream bed due to not enough water being released into the stream bed. However, since the amount of lifewater released into the stream bed is at a very good level, no negative impact on these species has been observed in the current situation.

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

Criterion 1: Refers to Critically Endangered (CR) and/or Endangered (EN) Species. **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** .

1.3.3 Mammals

(*Lynx*) is **one** of the species likely to be distributed in the region. *lynx*) is listed in the EN category according to the IUCN Mediterranean assessment. 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 not endangered, an important mammal species for the project area is **the Otter (*Lutra lutra*)** . Power plant employees confirmed the presence of the Otter in the area. 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 regional species 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 .

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 areas 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 connection also extends across elevation and climate gradients and across crest-to- coast to coast)” also includes biological corridors.

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 in 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. Beyköy The area where the 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 a large number of critical and/or endemic species. In this regard, the area **does not meet** Criterion 5 .

1.3.4 Ornithology

As a result of the studies, a total of 134 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 2 below.

A total of 4 globally endangered bird species have been identified around the facility. These species are assessed as “EN”, that is, endangered. Little Vulture (*Neophron percnopterus*) and “VU”, which means Vulnerable, the Imperial Eagle (*Aquila heliaca*), stepmother (*Streptopelia turtur*) and Elmabaş Patka (*Aythya ferina*) species. Of the identified species, 94 are listed in BERN Agreement Annex-2, 31 are listed in BERN Agreement Annex-1, 3 are listed in CITES Annex-1 and 14 are listed in CITES Annex-2.

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

Little Vulture (*Neophron percnopterus*) has a global Red List status of “EN” endangered. The species is expected to be seen in the project area during migration and in the spring and summer months corresponding to the breeding season (Kirwan et al., 2008). 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

Facility birds around This criterion It does not trigger.

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

Beyköy Weir and HEPP facility, elevation, moisture gradients or any other site that indicates that the region is vital to sustaining unique or distinctive evolutionary processes. is not significantly different from the surrounding region in terms of a geological, ecological or evolutionary factor. This for this reason facility around from habitats none, Criterion 5th It does not trigger.

Table 2: Project in the field Found and Finding Likely Bird Types

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	bern	MAKK	CITES
<i>Accipiter nisus</i>	Eurasian Sparrowhawk	Not endemic	LC	Annex 2	KD	Annex 2
<i>Acrocephalus scirpaceus</i>	Eurasian Reed Warbler	Not endemic	LC	KD	KD	KD
<i>Aegithalos caudatus</i>	Long-tailed Tit	Not endemic	LC	Annex 3	KD	KD
<i>Aegypius monachus</i>	Cinereous Vulture	Not endemic	LC	Annex 2	KD	KD
<i>Alauda arvensis</i>	Eurasian Skylark	Not endemic	LC	Annex 3	Annex 1	KD
<i>Alectoris chukar</i>	Chukar Partridge	Not endemic	LC	Annex 3	Annex 2	KD
<i>Anas platyrhynchos</i>	Mallard	Not endemic	LC	Annex 3	Annex 2	KD
<i>Anthus spinoletta</i>	Water Pipit	Not endemic	LC	Annex 2	KD	KD
<i>Apus apus</i>	Common Swift	Not endemic	LC	Annex 3	KD	KD
<i>Aquila chrysaetos</i>	Golden Eagle	Not endemic	LC	Annex 2	KD	Annex 2
<i>Aquila heliaca</i>	Eastern Imperial Eagle	Not endemic	VU	Annex 2	KD	Annex 1
<i>Ardea alba</i>	Great White Egret	Not endemic	LC	Annex 2	KD	KD
<i>Ardea cinerea</i>	Grey Heron	Not endemic	LC	Annex 3	Annex 1	KD
<i>Ardea purpurea</i>	Purple Heron	Not endemic	LC	Annex 2	KD	KD
<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>Caprimulgus europaeus</i>	European Nightjar	Not endemic	LC	Annex 2	KD	KD
<i>Carduelis carduelis</i>	European Goldfinch	Not endemic	LC	Annex 2	KD	KD
<i>Cecropis daurica</i>	Red-rumped Swallow	Not endemic	LC	Annex 2	KD	KD
<i>Cettia cetti</i>	Cetti's Warbler	Not endemic	LC	Annex 2	KD	KD
<i>Chloris chloris</i>	European Greenfinch	Not endemic	LC	Annex 2	KD	KD
<i>Ciconia ciconia</i>	White Stork	Not endemic	LC	Annex 2	KD	KD

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	bern	MAKK	CITES
<i>Ciconia nigra</i>	Black Stork	Not endemic	LC	Annex 2	KD	Annex 2
<i>Circaetus gallicus</i>	Short-toed Snake Eagle	Not endemic	LC	Annex 2	KD	Annex 2
<i>Coccothraustes coccothraustes</i>	Hawfinch	Not endemic	LC	Annex 2	KD	KD
<i>Columba livia</i>	Rock Pigeon	Not endemic	LC	Annex 3	Annex 2	KD
<i>Columba oenas</i>	Stock Dove	Not endemic	LC	Annex 3	Annex 1	KD
<i>Columba palumbus</i>	Common Wood Pigeon	Not endemic	LC	KD	Annex 2	KD
<i>Corvus corax</i>	Common Raven	Not endemic	LC	Annex 3	Annex 1	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>	Jackdaw	Not endemic	LC	KD	Annex 2	KD
<i>Cuculus canorus</i>	Common Cuckoo	Not endemic	LC	Annex 3	KD	KD
<i>Curruca communis</i>	Lesser Whitethroat	Not endemic	LC	Annex 2	KD	KD
<i>Curruca crassirostris</i>	Marmora's Warbler	Not endemic	LC	Annex 2	KD	KD
<i>Curruca curruca</i>	Lesser Whitethroat	Not endemic	LC	Annex 2	KD	KD
<i>Curruca melanocephala</i>	Sardinian Warbler	Not endemic	LC	Annex 2	KD	KD
<i>Cyanistes caeruleus</i>	Blue Tit	Not endemic	LC	Annex 2	KD	KD
<i>Delichon urbicum</i>	Common House Martin	Not endemic	LC	Annex 2	KD	KD
<i>Dendrocopos major</i>	Great Spotted Woodpecker	Not endemic	LC	Annex 2	KD	KD
<i>Dendrocytes medius</i>	Middle Spotted Woodpecker	Not endemic	LC	Annex 2	KD	KD
<i>Dryobates minor</i>	Lesser Spotted Woodpecker	Not endemic	LC	Annex 2	KD	KD
<i>Egretta garzetta</i>	Little Egret	Not endemic	LC	Annex 2	KD	KD
<i>Emberiza calandra</i>	Corn Bunting	Not endemic	LC	Annex 3	Annex 1	KD
<i>Emberiza cia</i>	Rock Bunting	Not endemic	LC	Annex 2	KD	KD
<i>Emberiza cirrus</i>	Cirl Bunting	Not endemic	LC	Annex 2	KD	KD

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	bern	MAKK	CITES
<i>Emberiza citrinella</i>	Yellowhammer	Not endemic	LC	Annex 2	KD	KD
<i>Emberiza hortulana</i>	Ortolan Bunting	Not endemic	LC	Annex 3	Annex 1	KD
<i>Emberiza melanocephala</i>	Black-headed Bunting	Not endemic	LC	Annex 2	KD	KD
<i>Erithacus rubecula</i>	European Robin	Not endemic	LC	Annex 2	KD	KD
<i>Falco peregrinus</i>	Peregrine Falcon	Not endemic	LC	Annex 2	KD	Annex 1
<i>Falco subbuteo</i>	Eurasian Hobby	Not endemic	LC	Annex 2	KD	Annex 2
<i>Falco tinnunculus</i>	Common Kestrel	Not endemic	LC	Annex 2	KD	Annex 2
<i>Falco vespertinus</i>	Red-footed Falcon	Not endemic	VU	Annex 2	KD	Annex 2
<i>Ficedula albicollis</i>	Collared Flycatcher	Not endemic	LC	Annex 2	KD	KD
<i>Fringilla coelebs</i>	Chaffinch	Not endemic	LC	Annex 3	Annex 1	KD
<i>Fringilla montifringilla</i>	Brambling	Not endemic	LC	Annex 3	Annex 1	KD
<i>Fulica atra</i>	Common Coot	Not endemic	LC	Annex 3	Annex 2	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>Garrulus glandarius</i>	Eurasian Jay	Not endemic	LC	KD	Annex 2	KD
<i>Gypaetus barbatus</i>	Bearded Vulture	Not endemic	NT	KD	KD	Annex 2
<i>Haliaeetus albicilla</i>	White-tailed Eagle	Not endemic	LC	Annex 2	KD	Annex 1
<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>Irania gutturalis</i>	White-throated Robin	Not endemic	LC	Annex 2	KD	KD
<i>Lanius collurio</i>	Red-backed Shrike	Not endemic	LC	Annex 2	Annex 1	KD
<i>Lanius minor</i>	Lesser Grey Shrike	Not endemic	LC	Annex 2	KD	KD
<i>Lanius nubicus</i>	Masked Shrike	Not endemic	LC	Annex 2	KD	KD
<i>Lanius senator</i>	Woodchat Shrike	Not endemic	LC	Annex 2	KD	KD

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	bern	MAKK	CITES
<i>Linaria cannabina</i>	Common Linnet	Not endemic	LC	Annex 2	KD	KD
<i>Loxia curvirostra</i>	Red Crossbill	Not endemic	LC	Annex 2	KD	KD
<i>Lullula arborea</i>	Wood Lark	Not endemic	LC	Annex 3	Annex 1	KD
<i>Luscinia megarhynchos</i>	Common Nightingale	Not endemic	LC	Annex 2	KD	KD
<i>Mareca penelope</i>	Eurasian Wigeon	Not endemic	LC	Annex 3	Annex 2	KD
<i>Melanocorypha bimaculata</i>	Two-spotted Lark	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>Monticola saxatilis</i>	Rock Thrush	Not endemic	LC	Annex 2	KD	KD
<i>Monticola solitarius</i>	Blue Rock Thrush	Not endemic	LC	Annex 2	KD	KD
<i>Motacilla alba</i>	White Wagtail	Not endemic	LC	Annex 2	KD	KD
<i>Motacilla cinerea</i>	Grey 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>Neophron percnopterus</i>	Egyptian Vulture	Not endemic	MOST	Annex 2	KD	Annex 2
<i>Nycticorax nycticorax</i>	Black-crowned Night Heron	Not endemic	LC	Annex 2	KD	KD
<i>Oenanthe isabellina</i>	Isabelline Wheatear	Not endemic	LC	Annex 2	Annex 1	KD
<i>Oenanthe melanoleuca</i>	Black-eared Wheatear	Not endemic	LC	Annex 2	KD	KD
<i>Oenanthe oenanthe</i>	Northern Wheatear	Not endemic	LC	Annex 2	Annex 1	KD
<i>Oriolus oriolus</i>	Golden Oriole	Not endemic	LC	Annex 2	KD	KD
<i>Pandion haliaetus</i>	Osprey	Not endemic	LC	Annex 2	KD	Annex 2
<i>Parus major</i>	Great Tit	Not endemic	LC	Annex 2	KD	KD
<i>Passer domesticus</i>	House Sparrow	Not endemic	LC	KD	Annex 2	KD
<i>Passer hispaniolensis</i>	Spanish Sparrow	Not endemic	LC	Annex 3	Annex 1	KD

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	bern	MAKK	CITES
<i>Passer montanus</i>	Eurasian Tree Sparrow	Not endemic	LC	Annex 3	Annex 1	KD
<i>Perdix perdix</i>	Grey Partridge	Not endemic	LC	KD	Annex 2	KD
<i>Periparus ater</i>	Coal Tit	Not endemic	LC	Annex 2	KD	KD
<i>Pernis apivorus</i>	European Honey Buzzard	Not endemic	LC	Annex 2	KD	Annex 2
<i>Petronia petronia</i>	Rock Sparrow	Not endemic	LC	Annex 2	KD	KD
<i>Phalacrocorax carbo</i>	Great Cormorant	Not endemic	LC	Annex 3	Annex 1	KD
<i>Phoenicurus ochruros</i>	Black Redstart	Not endemic	LC	Annex 2	KD	KD
<i>Phoenicurus phoenicurus</i>	Common 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>Pica pica</i>	Magpie	Not endemic	LC	KD	Annex 2	KD
<i>Picus viridis</i>	European Green Woodpecker	Not endemic	LC	Annex 2	KD	KD
<i>Podiceps cristatus</i>	Great Crested Grebe	Not endemic	LC	Annex 3	KD	KD
<i>Poecile lugubris</i>	Sombre Tit	Not endemic	LC	Annex 2	KD	KD
<i>Ptyonoprogne rupestris</i>	Rock Martin	Not endemic	LC	Annex 2	KD	KD
<i>Regulus ignicapillus</i>	Firecrest	Not endemic	LC	Annex 2	KD	KD
<i>Regulus regulus</i>	Goldcrest	Not endemic	LC	Annex 2	KD	KD
<i>Saxicola rubicola</i>	European Stonechat	Not endemic	LC	Annex 2	KD	KD
<i>Serinus serinus</i>	European Serin	Not endemic	LC	Annex 2	KD	KD
<i>Sitta europaea</i>	Eurasian Nuthatch	Not endemic	LC	Annex 2	KD	KD
<i>Sitta krueperi</i>	Krüper's Nuthatch	Not endemic	NT	Annex 2	KD	KD
<i>Sitta neumayer</i>	Western Rock Nuthatch	Not endemic	LC	Annex 2	KD	KD
<i>Spinus spinus</i>	Eurasian Siskin	Not endemic	LC	Annex 2	KD	KD
<i>Sterna hirundo</i>	Common Tern	Not endemic	LC	Annex 2	KD	KD

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	bern	MAKK	CITES
<i>Streptopelia decaocto</i>	Eurasian Collared Dove	Not endemic	LC	Annex 3	Annex 1	KD
<i>Streptopelia senegalensis</i>	Laughing Dove	Not endemic	LC	Annex 3	Annex 1	KD
<i>Streptopelia turtur</i>	European Turtle Dove	Not endemic	VU	Annex 3	Annex 2	KD
<i>Sturnus vulgaris</i>	Common Starling	Not endemic	LC	KD	Annex 1	KD
<i>Sylvia atricapilla</i>	Blackcap	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>Troglodytes troglodytes</i>	Wren	Not endemic	LC	Annex 2	KD	KD
<i>Turdus iliacus</i>	Redwing	Not endemic	NT	Annex 3	Annex 1	KD
<i>Turdus merula</i>	Common Blackbird	Not endemic	LC	Annex 3	Annex 2	KD
<i>Turdus philomelos</i>	Song Thrush	Not endemic	LC	Annex 3	Annex 2	KD
<i>Turdus pilaris</i>	Fieldfare	Not endemic	LC	Annex 3	Annex 1	KD
<i>Turdus torquatus</i>	Ring Ouzel	Not endemic	LC	Annex 2	KD	KD
<i>Turdus viscivorus</i>	Mistle Thrush	Not endemic	LC	Annex 3	Annex 1	KD
<i>Upupa epops</i>	Hoopoe	Not endemic	LC	Annex 2	KD	KD

1.1 Identification of Hydrobiological Biodiversity in the Impact Area of Beyköy Regulator and HEPP Facility

taxa (species and subspecies) belonging to 4 different algae classes have been identified in and around the project area . Especially the Bacillariophyta (diatom) group of algae has become the richest class in terms of diversity. 52 taxa belonging to this class, 12 belonging to Chlorophyta , 11 belonging to Cyanophyta and 1 taxon belonging to Euglenophyta were found.

Bacillariophyta (Diatom) in all of the sampling stations . The second dominant group in terms of species diversity of the region is Chlorophyta and Cyanophyta . These taxa have been reported from many localities in Turkey and have a wide distribution. Among the species belonging to Chlorophyta , Spirogyra sp. type comes to the fore. The most dominant species of the class Cyanophyta Oscillatoria sp. has happened. This to the genus connected species very wide One distribution profiles has. Dinophyta and Euglenophyta classes were found in very few numbers in terms of species number and density .

In general, all identified freshwater algae species are cosmopolitan and there are no endemic, rare or endangered species specific to the region.

During the examinations carried out in and around the project area, a total of 13 taxa belonging to Rotifera and Copepoda, which are groups that constitute zooplanktonic organisms, were identified. The most dominant group of these is the Rotifera group. Rotifera While there are 12 taxa belonging to the phylum Brachionus calyciflorus and Keratella cochlearis species are dominant. One taxon has been identified from Copepoda , Cyclops sp. was found to be important in this group. The main factors affecting the distribution of zooplankton in freshwater systems can be classified as food, competition, mechanical relations with other living things, predation and parasitism, as well as the physical and chemical properties of the water. Changes in environmental factors depending on temperature affect the distribution of zooplanktonic organisms (Wetzel, 1983, Herzig , 1984). zooplankton Another important factor affecting community structure is predation . Many invertebrates and fish feed on Rotifera at least during a certain period of their lives (Herzig , 1980). In addition, current is a disadvantage in the distribution of zooplanktonic organisms.

A total of 17 benthic invertebrate species belonging to four major groups were identified based on sampling at 4 different stations in and around the project area . Of these, 2 belong to Gastropoda , 1 to Crustaceae , 1 to Crustaceae , and 13 to Insecta .

In aquatic ecosystems, benthic organisms have a significant proportion of indicator species. These creatures are also an indicator group of communities that are polluted or under stress, especially as a result of anthropogenic effects. According to the sampling results, no species that could be described as a pollution indicator was found. In addition, in high mountain waters and Crustacea, which is considered a clean water indicator. *Gammarus* The taxon is known as a clean water indicator. In particular, this taxon is the dominant group in both stations and are biological indicators that indicate that the area has clean water quality.

8 fish species belonging to 3 different families have been identified in the project area and its surroundings . The Cyprinidae family is represented by the highest number of species (6 species).

Among the most important species of the study area is *Oncorhynchus*, belonging to the Salmonidae family. *mykiss* (Rainbow Trout) species. *oncorhynchus mykiss* It is a cultured species and not a natural fish of these waters. Individuals escaping from the surrounding fish farms have adapted to these environments. The distribution of these species in Turkey is in the river basins of Anatolia and they are not narrowly distributed endemic species.

Table 3 Project Area And Around belonging Alga Types

BACILLARIOPHYTA	<i>Melosira varians</i>	CYANOPHYTA
<i>cyclotella meneghiniana</i>	<i>meridion circulare</i>	<i>Chroococcus limneticus</i>
<i>cyclotella ocellata</i>	<i>Navicula arenaria</i>	<i>gomphosphaeria aponina</i>
<i>Melosira varians</i>	<i>N. bacillum</i>	<i>lyngbya aerugineo - caerulea</i>
<i>Achnanthes minutissima</i>	<i>N. cryptocephala</i>	<i>nostoc commune</i>
<i>amphora ovalis</i>	<i>N. cryptocephala there is. intermedia</i>	<i>Oscillatoria amphibia</i>
<i>A. ovalis there is. pediculus</i>	<i>N. cryptocephala there is. Veneta</i>	<i>HE. curviceps</i>
<i>anomoeoneis sphaerophora</i>	<i>N. radiosa</i>	<i>HE. limnetica</i>
<i>aulacoseria granulate</i>	<i>N. rhynchocephala</i>	<i>HE. limosa</i>
<i>caloneis permagna</i>	<i>Nitzschia constricta</i>	<i>HE. subbrevis</i>
<i>ceratoneis arcus</i>	<i>Nitzschia hungarica</i>	<i>HE. tenuis</i>
<i>C. arcus there is. amphioxys</i>	<i>Nitzschia palea</i>	<i>spirulina major</i>
<i>coconeis placenta</i>	<i>Nitzschia sigmoidae</i>	EUGLENOPHYTA
<i>cyclotella meneghiniana</i>	<i>Rhopalodia gibba</i>	<i>Euglena oxyuris</i>
<i>Cymatopleura solea</i>	<i>surirella angustate</i>	
<i>Cymbella affinis</i>	<i>S. linearis</i>	
<i>Cymbella cistula</i>	<i>S. ovalis</i>	
<i>C. amphicephala</i>	<i>S. robusta</i>	
<i>C. cymbiformis</i>	<i>S. robusta there is. splendida</i>	
<i>C. prostrata</i>	CHLOROPHYTA	
<i>C. sinuata</i>	<i>Chlamydomonas sp.</i>	
<i>C. tumidula</i>	<i>Scenedesmus sp.</i>	
<i>diatom vulgare there is. brevis</i>	<i>ulothrix variabilis</i>	
<i>didymosphenia geminata</i>	<i>oedogonium sp.</i>	
<i>Epithemia Argus</i>	<i>Closterium aciculare</i>	
<i>Epithemia sores</i>	<i>Closterium littoral</i>	
<i>Fragilaria construens</i>	<i>C. lunula</i>	
<i>F. crotonensis</i>	<i>C. parvulum</i>	
<i>Fragilaria dilatata</i>	<i>cosmarium botrytis</i>	
<i>Fragilaria ulna</i>	<i>C. laeve</i>	
<i>gyrosigma acuminatum</i>	<i>C. vexatum</i>	
<i>gomphonema constriction</i>	<i>Spirogyra sp.</i>	
	<i>G. olivaceum</i>	
	<i>hantzschia amphioxys</i>	

Table 4 Project Area And Around belonging zooplanktonic Types

ROTIFERA
<i>Ascomorpha reign</i>
<i>brachionus quadridentatus</i>
<i>brachionus calyciflorus</i>
<i>cephalodella gibba</i>
<i>Euchlanis dilatata</i>
<i>filinia longiseta</i>
<i>keratella cochlearis</i>
<i>keratella quadrata</i>
<i>Lecane luna</i>
<i>Mytilina ventralis</i>

<i>notholca acuminata</i>
<i>polyarthra dolichoptera</i>

IN COPEPO
<i>cyclops sp.</i>

Table 5 Project Area And Around belonging benthic organisms

Branch: MOLLUSIAN
Class: GASTROPODA
Set: PROSOBRAHCHIATA
Family: Valvatidae
<i>Valvata piscinalis</i> Müller
Set: PULMONATA
Family: Ancyliidae
<i>Ancylus fluviatilis</i> Müller
Branch: ANNELIDA
Class: CLITELLATA
Set: HIRUDINEA
Family: Erpobdellidae
<i>Erpobdella octoculata</i> L.
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: heptageniidae
<i>heptagenia sp.</i>
Family: Ephemerellidae
<i>ephemerella ignita</i> poda
Set: PLECOPTERA
Family: perlidae
<i>perla marginate</i> Sun .
Set: COLEOPTERA
Family: Noteridae
<i>noterus clavicornis</i> (Deg .)
Family: Elmidae
<i>Elmis sp.</i>
Set: TRICHOPTERA
Family: Rhyacophilidae
<i>rhyacophila sp.</i>
Family: Hydropsychidae
<i>hydropsyche sp.</i>
Set: DIPTERA
Family: Blephariceridae
<i>liponeura sp.</i>
Family: Limoniidae
<i>Eriocera sp.</i>
Family: Simuliidae
<i>Simulium sp.</i>
Family: Athericidae

Atherix ibis F.
Family: chironomidae
Chrinomus sp.

Table 6 Project in the field Detection made Fish Types And Protection Status

Family	Type And subspecies	Turkish First Name	endemism	BERN	IUCN	CITES	natural kind	exotic species
Salmonidae	<i>oncorhynchus mykiss</i>	Rainbow trout	-	-	WHA T	-	X	-
Cyprinidae	<i>alburnoides bipunctatus</i>	Dotted Pearl snapper	-	-	LC	-	X	-
	<i>barbus escherichii</i>	moustachioed Fish	-		VU	-	X	-
	<i>Capoeta sieboldii</i>	Fringed Syraz	-	-	WHA T	-	X	-
	<i>cyprinus carpio</i>	Carp	-	-	LC	-	X	-
	<i>Squalius pursakensis</i>	Freshwater mullet	-	-	LC	-	X	-
	<i>chondrostoma angorense</i>	Karaburun	-	-	LC	-	X	-
Siluridae	<i>Silurus glanis</i>	Broadcasting fish	-	-	LC	-	X	-

1.4 biodiversity Risk Evaluation

1.4.1 Flora

IFC PS-6 and Guidance in the facility area No plant taxon with CR and EN status that complies with Note 6 criteria was found. Therefore, there is no critical habitat supporting these taxa . Apart from the coppice tree communities whose cover has been broken by human influence, there are reeds, reeds and willows in non-seasonal, fast-flowing stream beds.

➤ 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 7). 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, in order 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 7 Project in the field Found And Finding Likely Invader Species

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

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

conyza bonariensis (Coyote) andropogenic to the effect
open spaces



conyza albida (Maplewort) andropogenic to the effect
open spaces



Cuscuta campestris (Turkish) meadow-pasture habitats



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

<i>Senecio vernalis</i> (Canary herb) Path edge And Areas shaped by human influence	
<i>Sicyos angulatus</i> (Itdolanbacı) Damp fields	
<i>Solanum americanum</i> (Push grape) This edge And moist shady places	
<i>portulaca oleracea</i> (Purslane) Field, open area	
<i>phytolacca americana</i> (Confectioner dye) Stream bearings and moist habitats	

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

Viscum album (Lime herb) to the trees interference



1.4.2 Fauna

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

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.

Lynx Risk assessment for lynx) : The habitat of the project area and its surroundings seems suitable for this species and it has a general distribution in the region. It is difficult to be seen by humans because it prefers to stay away from humans and is very well camouflaged. It seems unlikely that the animal will be negatively affected by a HEPP facility due to its lifestyle. Although it has moved away from the area to some extent due to human activity and noise only during the construction period, it is highly likely that it will continue to use the area during the current operation phase. However, it would be useful to raise awareness about the species and take some precautions to prevent harm to the species, especially in possible human-lynx encounters. These issues are detailed in the Biodiversity Action Plan.

Risk assessment for otter (*Lutra lutra*) : Its presence in the project area is highly likely. There is no direct threat to the species. The species will continue to exist as long as there is sufficient life water in the stream beds .

1.4.3 Ornithology

IFC PS-6 and Guidance Taking into account the Note 6 criteria, the "critical species" assessment and "critical habitat" assessment were made in chapter 4, and Critical There are species. This type Small Vulture (*Neophron percnopterus*) . Attention should be paid to the actions provided in the Biodiversity Action Plan for the species in question.

According to the field studies and literature compilation, there are many structures around the Beyköy HEPP facility and dam. floating bird Type And active migration movements detection has been made. Detection made migration Storks in groups (*Ciconia ciconia*) And Black stork (*Ciconia nigra*) like species is has been observed. It has been determined in past studies that storks collide with transmission lines (Garrido and Fernández-Cruz , 2003). In addition, the endangered soaring predators of the Royal Eagle (*Aquila*) *around the facility. heliaca*) and Little vulture (*Neophron percnopterus*) species have also been detected, and these species, like other soaring predators, are at risk of colliding with transmission lines. Making the necessary determinations on this issue and taking precautions, if necessary, according to the results. must be taken (see Biodiversity Action Plan). Apart from this, the facility does not have a direct negative impact on bird diversity and populations .

1.4.4 hydrobiology

There are no intensive fishing activities in the region. However, cage type fishing activities are carried out to a small extent.

Rivers are complex and dynamic ecosystems. By changing these areas, lotic species will be affected and reduced by the loss of breeding grounds along with significant environmental change. River species normally live and spawn in shallow places and look for such habitats after the formation of the dam lake. If they cannot find it, they face losing competition with other lentic species due to the difference in their ecological niches. After the formation of such areas in HEPP-like applications, areas where some species can live should also be protected. Aquatic species; It adapts to the living conditions in a particular river section and creates characteristic biocoenoses shaped by the change of abiotic factors along the stream (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.

invasive algae, zooplankton , benthic organisms or fish species were found in Beyköy HEPP and surrounding areas. Social responsibility projects and biodiversity action plans are important at this point.

1.4.5 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 8 .

Table 8 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. Regarding the issue dated 26.06.2021 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	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; 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. 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".
		Medical Wastes	For medical waste generated within the scope of the activity; waste at the source -most member will download system establishment 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, 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.
		Waste Electronic Things	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 22.02.2012 and numbered 28300.to be is required.
		Waste oils	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

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 06.06.2015 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 211.2006 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 It is collected in the septic tank and it has been determined that it is disposed of by using a sewer 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.

1.5 biodiversity Action plan

Beykoy regulator And HEPP facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
BK1	All Habitats	Critical Conservation of Fauna Species	General Area	Endangered Fauna types His research particularly focused on the Lesser Vulture (<i>Neophron Percnopterus</i>) Species Project Area and Around It should be investigated	Population by Expert Biologists Level Monitoring	During Operation	2 Year Duration: March-November Between
BK2	Business	Fauna Conservation of Species	Project Area And surroundings	Tortoise (<i>Testudo</i> Facility Employees Should Be Provided Training About <i>Graeca</i>) Species. "Attention Tortoise" at Certain Points of the Project Area "It may come out." signs It must be placed.	Biologists who are experts on the subject Training Should Be Provided by	During Operation	April-May 2024 one Times
BK3	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 Researched And Training Should Be Provided.	Population by Expert Biologists Level Monitoring	During Operation	2024 Year September Bear 1 Time
BK4	Business	Fauna Conservation of Species	Project Area And surroundings	Lynx (<i>lynx lynx</i>) Type About Facility Employees Should Be Provided Training	subject professional biologists Training Should Be Provided by	During Operation	April-May 2024

BK5	Business	Fauna Conservation of Species	Project Area And surroundin gs	Pet Cats Should Never Be Keeped in the Facility. Although it is recommended not to have a pet dog, Even Especially Night Free They Should Not Be Allowed To Roam	Company By	During Operatio n	April-May 2024

Beykoy regulator And HEPP facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
BK6	Business	Fauna Conservation of Species	Project Area And surroundings	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
BK7	Business	Man And All Fauna Species Conservation	Project Area And surroundings	The Water Transmission Channel of the Project is Largely in the Form of an Open Channel. Some parts of this canal are surrounded by fences, but it has been observed that some parts are not fenced . Animal to the Channel And Person Fencing the Entire Channel to Prevent Falling It is recommended.	Company By	During Operation	2022 November
BK8	All Habitats	Invader Blocking Species	Project Area And surroundings	Invasive Species Found in and Around the Project Area Should be Investigated Area And Surroundings by watching dismantling of your plan Must be prepared	Population by Expert Biologists Level Monitoring	During Operation	one Year Duration in July and August

Beykoy regulator And HEPP facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
BK9	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
BK10	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
BK11	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
BK12	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	

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).

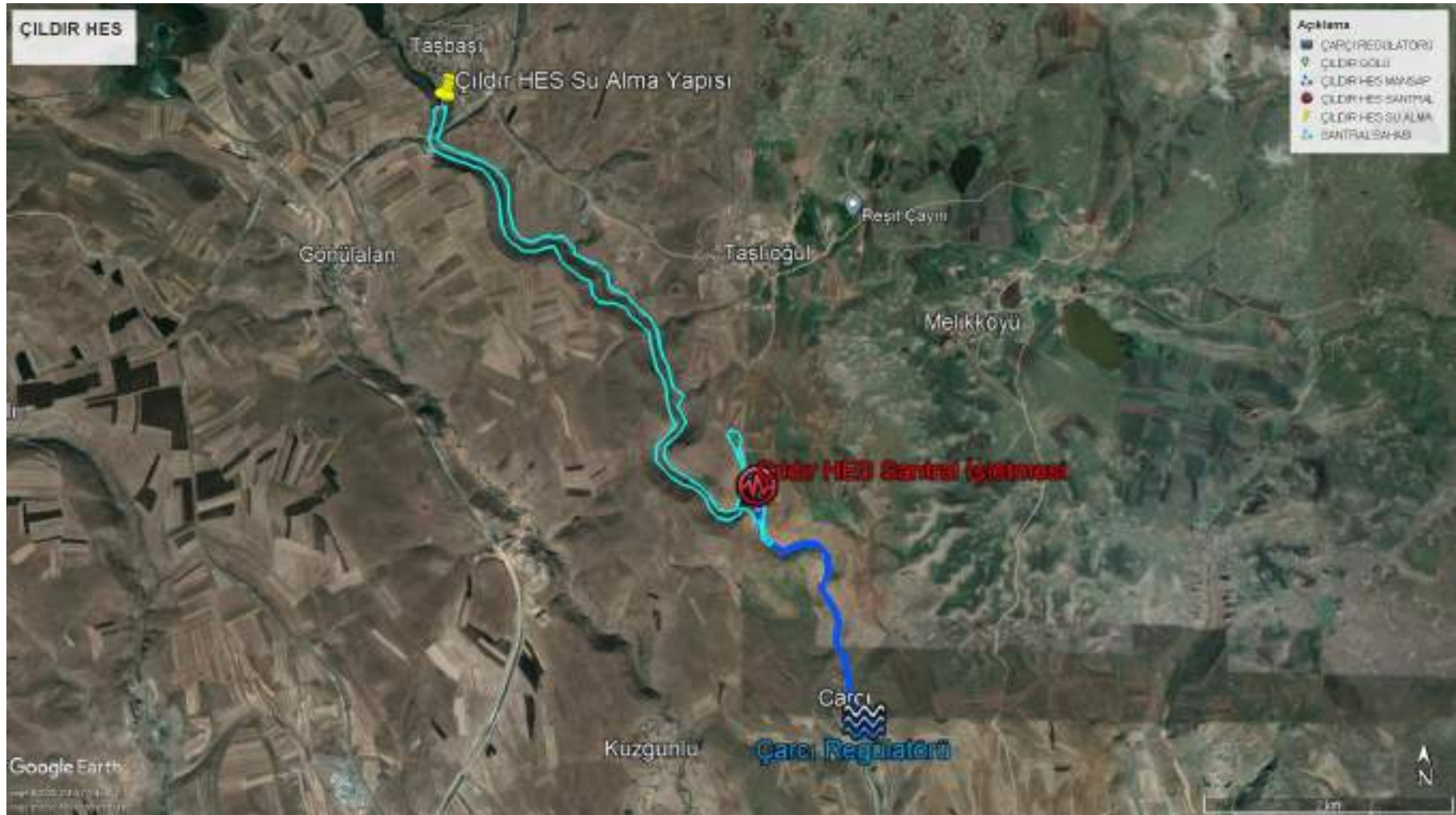


Figure 1: Satellite Image of the Project Site

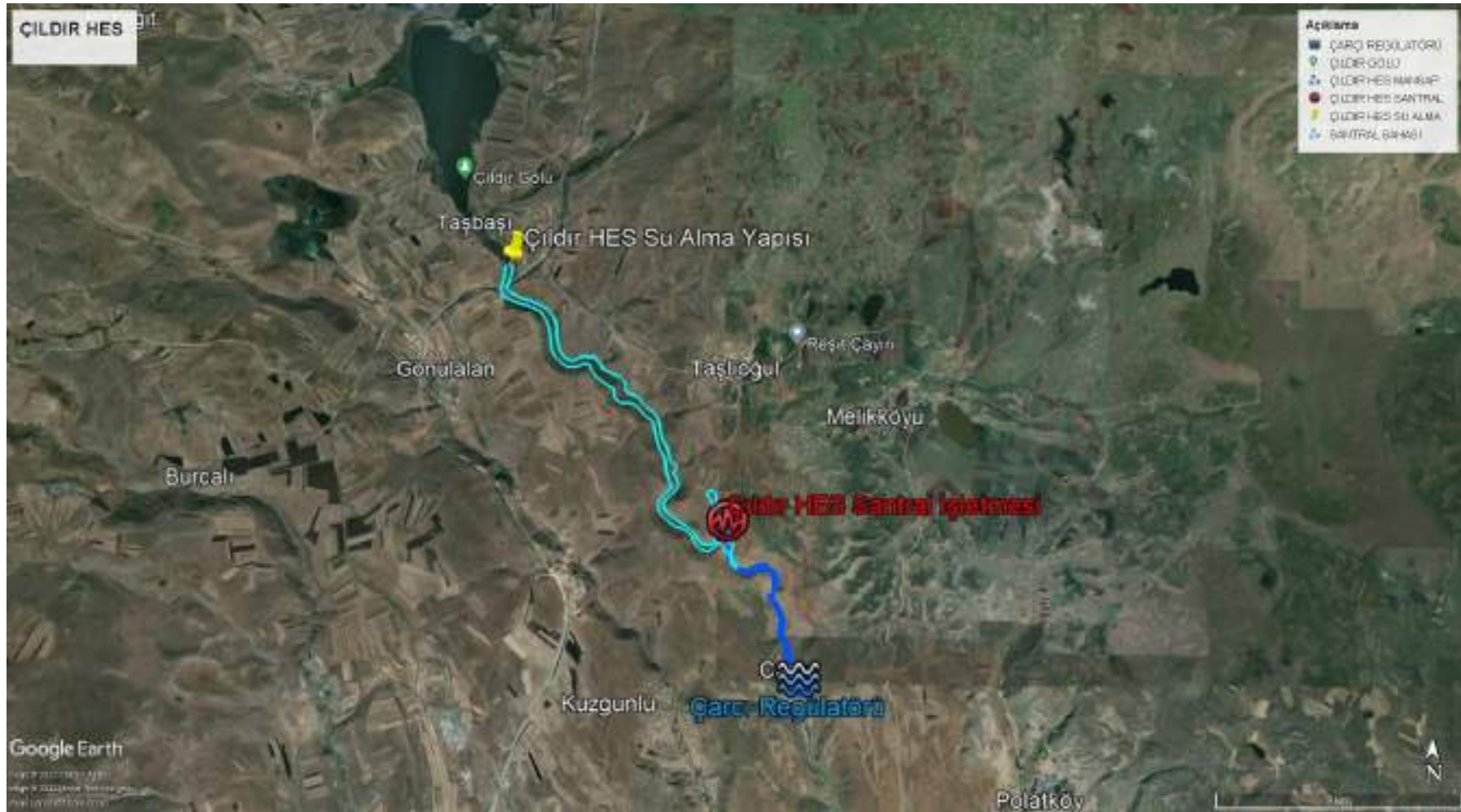


Figure 2: Satellite Image of the Project Field

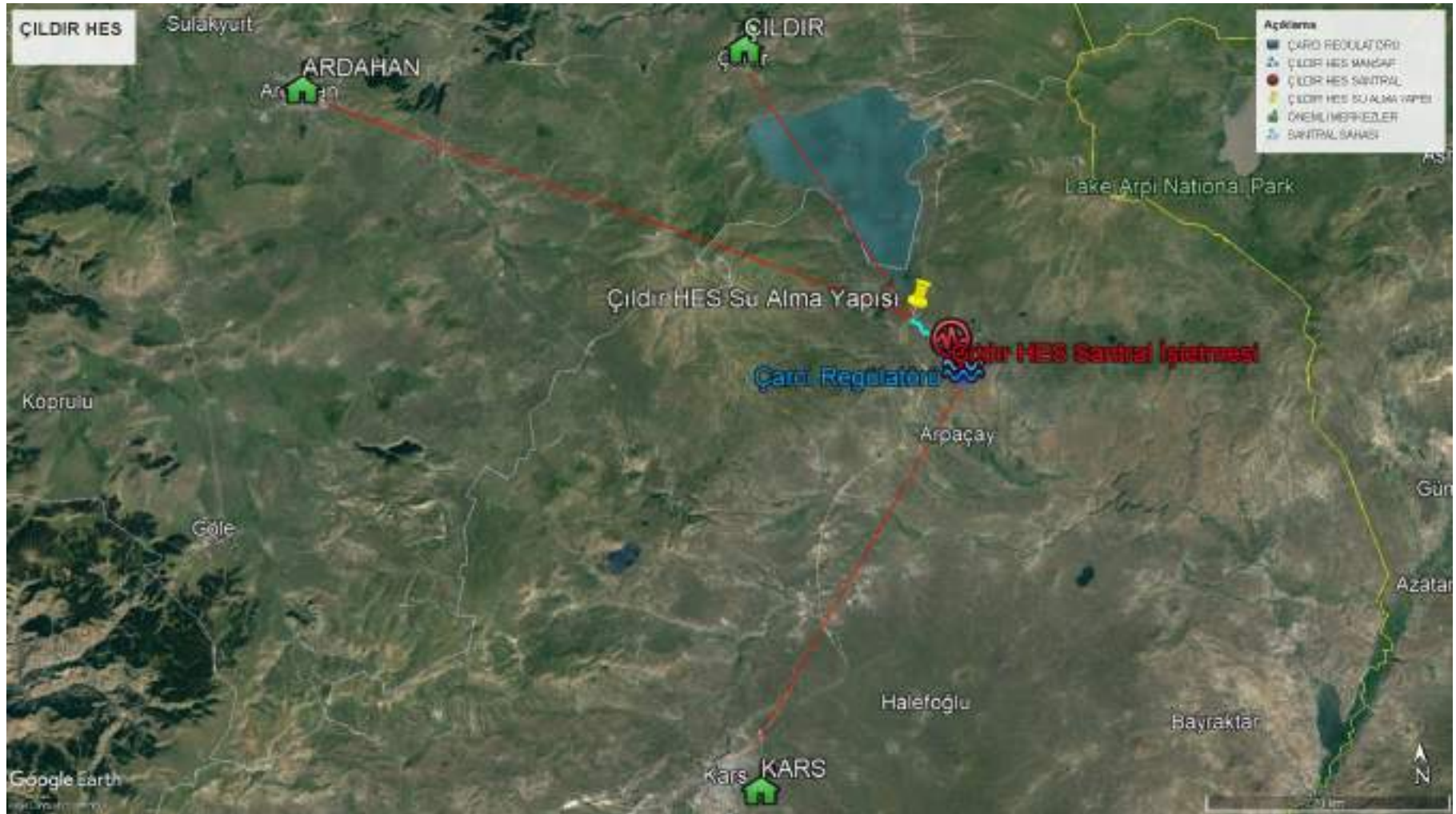


Figure 4: Settlements Near the Project Site

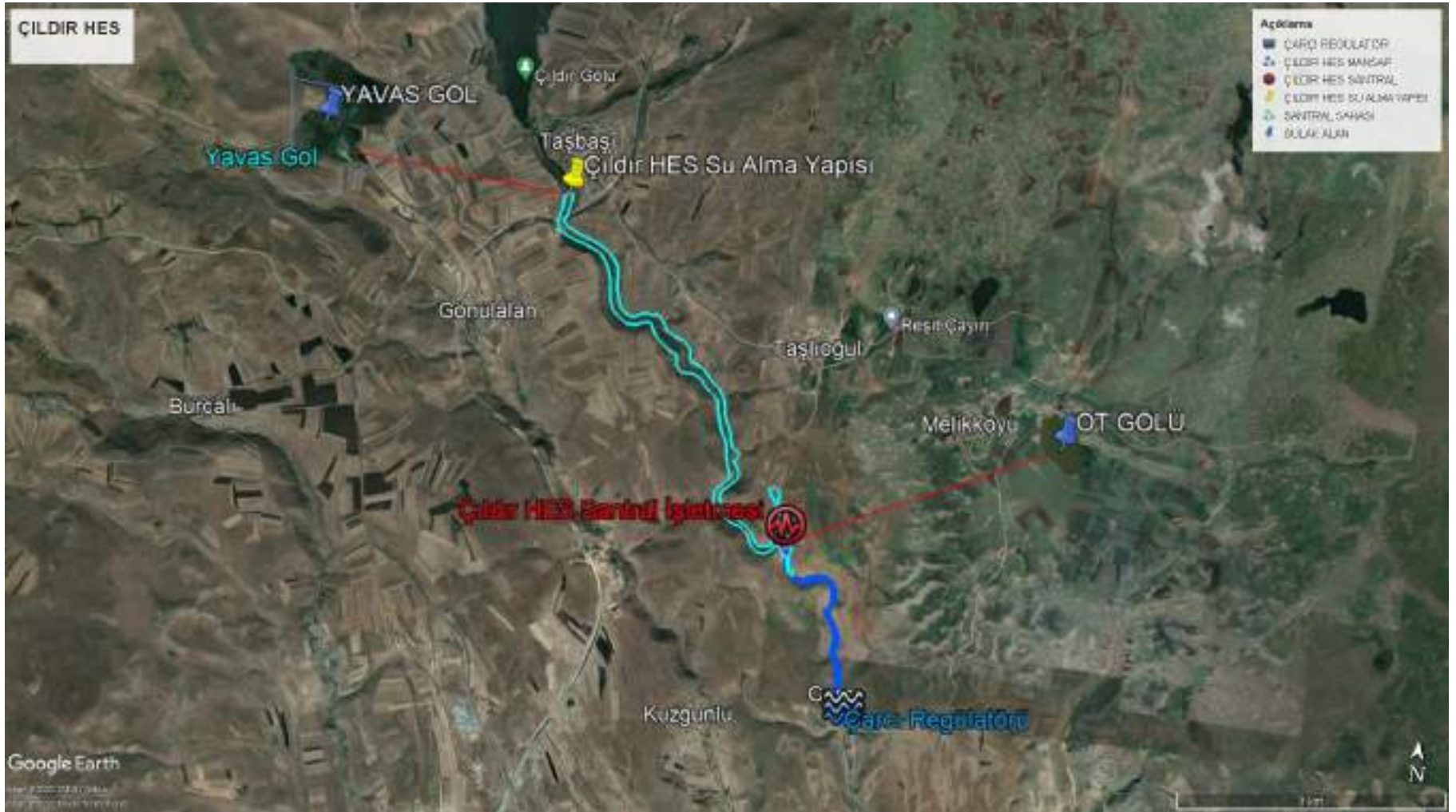


Figure 5: Significant Water Bodies Surrounding the Project Area

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).



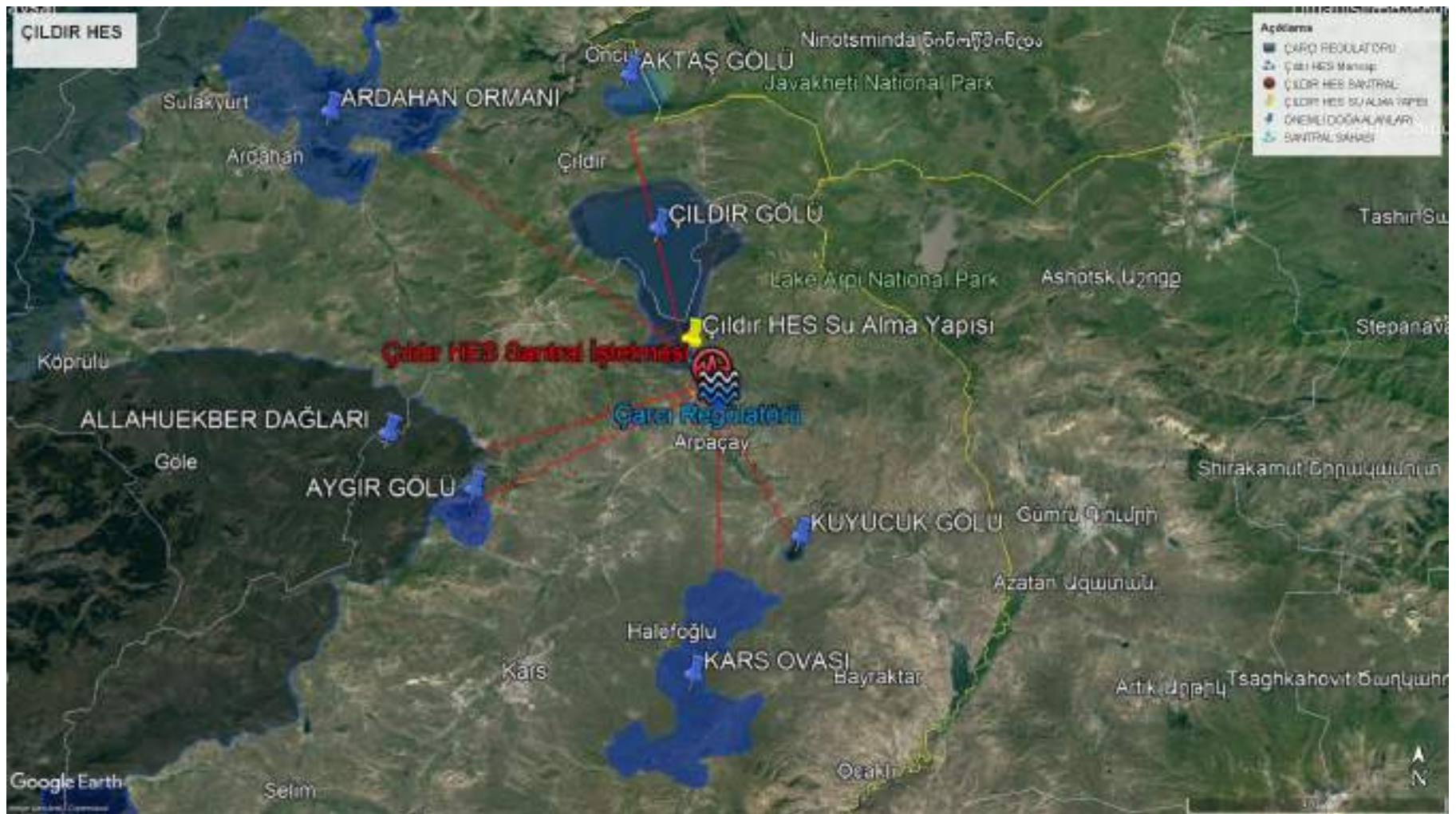


Figure 7: Satellite Image Showing the Relationship Between the Project Site and Protected Areas

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 Arpaçay 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

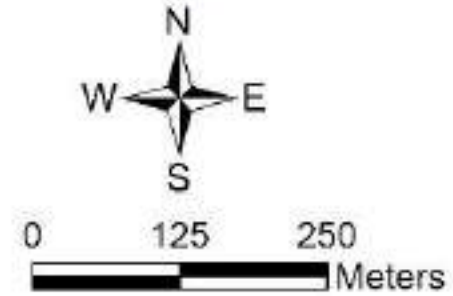


Figure 8: Çıldır HPP EUNIS Habitat Map 1



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* , *Bellevalia 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 *eriopoda*, *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 raloides</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>	Syrax, 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

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

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

conyza bonariensis (Coyote) andropogenic to the effect
open spaces



conyza albida (maplewort) andropogenic to the effect
open fields



Cuscuta campestris (Turkish) meadow-pasture habitats



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

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

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

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	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; 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. 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".
		Medical Wastes	For medical waste generated within the scope of the activity; waste at the source -most member will download system establishment 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, 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.
		Waste Electronic Things	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.
		Waste oils	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

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

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	in the region Bear (<i>Ursus Arctos</i>) is available. Human-Bear Encounters Can Sometimes Be Dangerous. 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.	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 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

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	

İKİZDERE REGULATOR AND HEPP FACILITY BIODIVERSITY ACTION PLAN

1.1 Entrance

The İkizdere Hydroelectric Power Plant (HPP), operated by Zorlu Doğal Elektrik Üretimi A.Ş., is located on the İkizdere River (downstream known as İyidere) within the borders of İkizdere District, Rize Province, in the Eastern Black Sea Basin. It is situated on the Tortum G45-a4 sheet of the 1/25,000 scale Topographic Map.

Construction of the İkizdere Hydroelectric Power Plant began in 1955, and it commenced production activities in 1961. In 1971, with the transition to the interconnected system, it was transferred to the Turkish Electricity Authority and, under the General Directorate of EÜAŞ, produced an average of 120 million kWh of electricity annually. In 2007, it was incorporated into Ankara Doğal Elektrik Üretim A.Ş., and the energy facilities were privatized as a state policy. In this context, the İkizdere Hydroelectric Power Plant was purchased by Zorlu Doğal Elektrik Üretimi A.Ş. and is operated under the production license EÜ/1723-42/1247 issued by the Energy Market Regulatory Authority (EPDK) on 01.09.2008.

Currently, the water taken by the Tirol-type Demirkapı Regulator, constructed at an elevation of 630.50 m on the İkizdere River, is transferred to the Cimil Regulator, constructed at an elevation of 625.50 m on the Cimil Stream, via a free-surface diversion tunnel 794 m in length. The flow diverted by both regulators is channeled to the loading pool at the end of a 3,327 m free-surface tunnel and then dropped to the İkizdere HPP, which has an installed capacity of 18.6 MWm - 17.14 MWe, at a tailwater level of 457.50 m, converting it into energy. The active volume of the loading pool is 570 m³.

The İkizdere HPP Project is located in the Black Sea Region, within the borders of Rize Province. Rize, surrounded by Of (Trabzon) to the west, İspir (Erzurum) to the south, Yusufeli and Arhavi (Artvin) to the east, and the Black Sea to the north, covers an area of 3,920 km² excluding its lakes. The Demirkapı Regulator is located 2.00 km southeast of İkizdere District, 2.00 km south of Mezra Neighborhood, 1.00 km north of Sancaklı Neighborhood, and at an elevation of 630.50 m on the İkizdere River. The Cimil Regulator is situated 1.60 km southeast of İkizdere District, 500.00 m south of Gündoğdu Neighborhood, 1.00 km north of Aylalar Neighborhood, 1.60 km

northwest of Punburluk Hill, and at an elevation of 625.50 m on the Cimil Stream, which joins the İkizdere River on the right bank downstream. The İkizdere HPP is located 1.80 km northwest of İkizdere District, 1.50 km south of Cami Neighborhood, 1.20 km northeast of Güney Neighborhood, 2.50 km southwest of İstarina Hill, and at a tailwater level of 4550 m on the right bank of the İkizdere River (downstream known as İyidere). The district center of İkizdere is situated in a deep valley at the confluence of the steep and high Rize mountains, which reach elevations of 2000 meters (Figures 3-4).

The Çağrankaya Mountains and plateaus lie to the east, while the Rüzgarlı Koyu Mountains and plateaus are to the west. The district, located at the confluence of the Camlık and Cimil Streams, which flow from the valleys of these two opposing mountains, is named "İKİZDERE," meaning "Twin Streams." With an area of 898 km², İkizdere is the largest district in Rize Province and borders Trabzon, İspir, Çamlıhemşin, Rize, Kalkandere, and Çayeli. The average elevation of the study area and its surroundings is 1773.83 m, with a maximum elevation of 3150 m and a minimum of 170 m, creating a varied topographic structure. There are significant wetlands in the planed area that may attract birds (Figure 5)

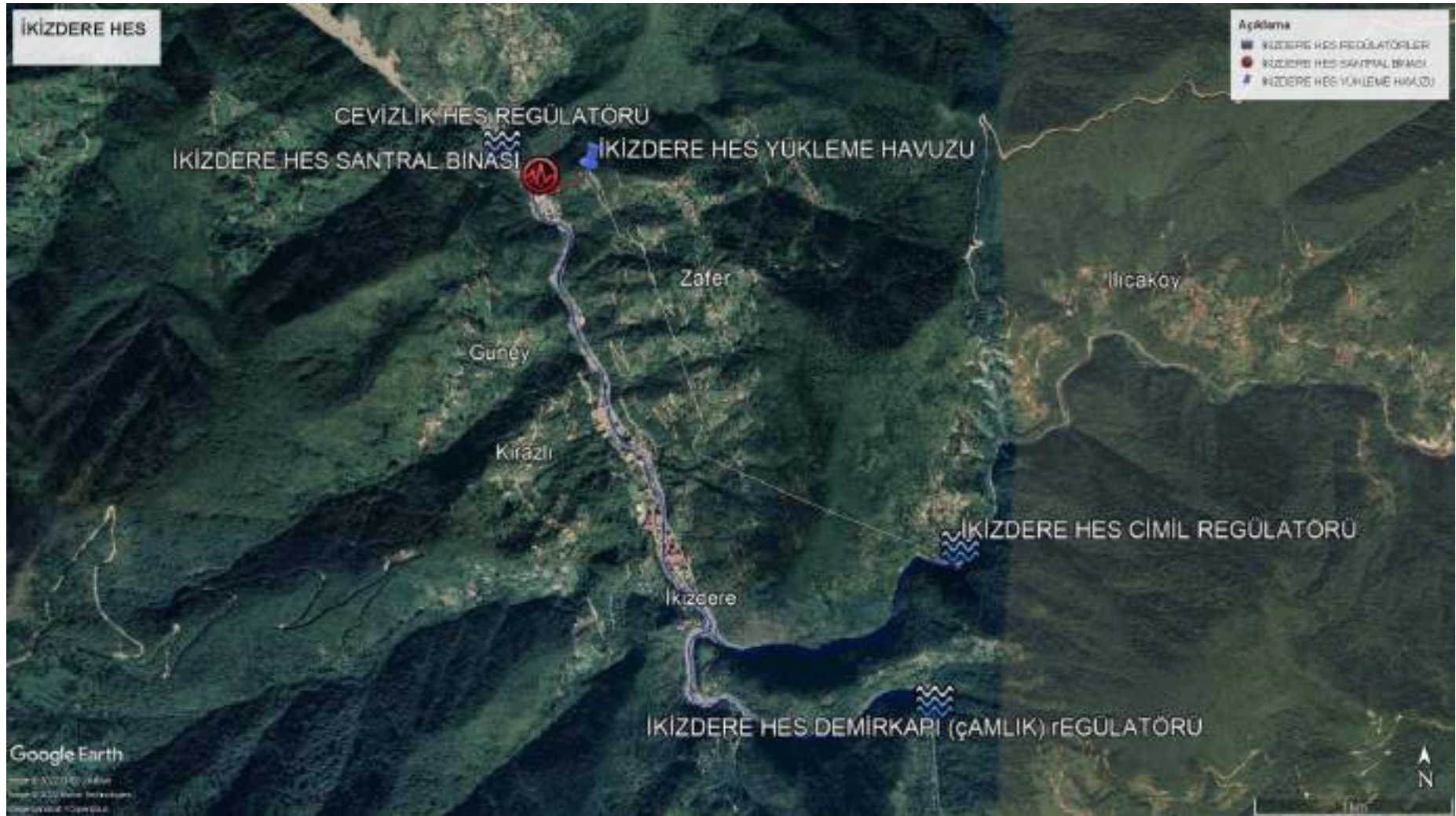


Figure 1: Satellite Image of the Project Site

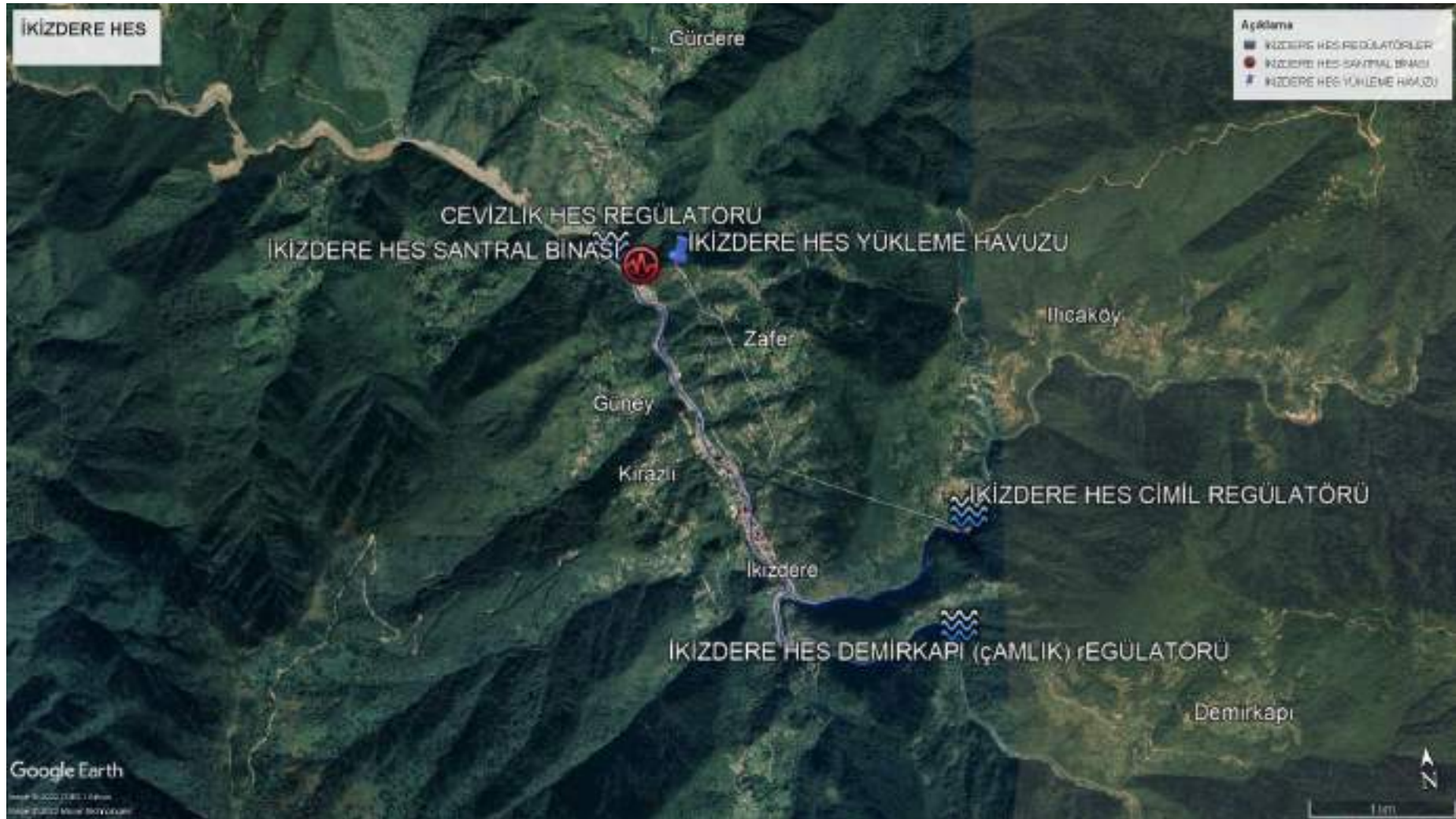


Figure 2: Satellite Image of the Project Site

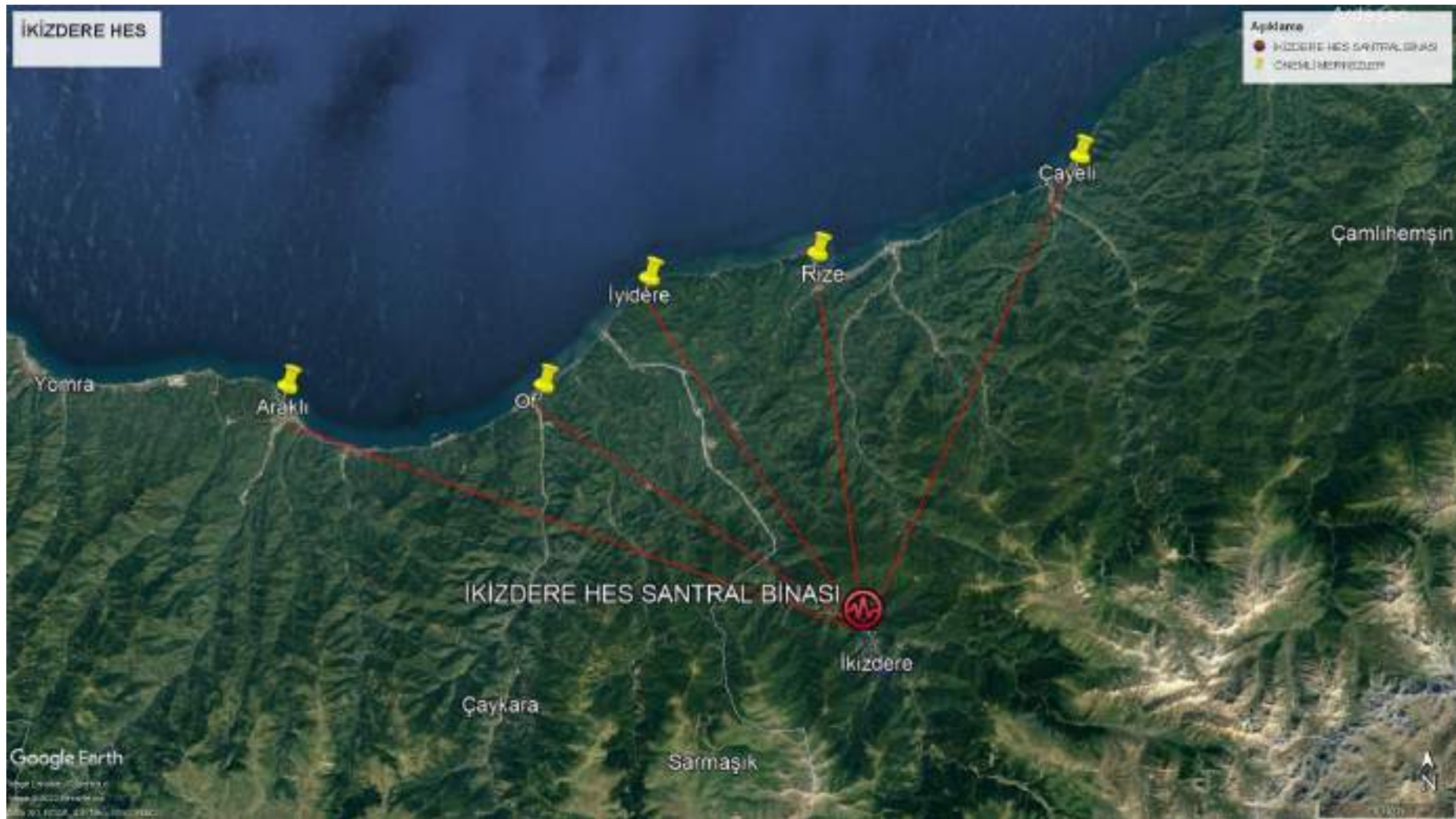


Figure 4: Settlements Near the Project Site



Figure 5: Significant Wetlands Surrounding the Project Area

1.2 Relationship of the Area with Protected and Special Status Areas

When evaluating the İkizdere HPP site and the surrounding protected areas and important natural sites, the project area is located within the Eastern Black Sea Mountains Important Natural Area (ÖDA). Additionally, the following significant areas are located at various distances from the project site: Çoruh Valley is approximately 45.5 km away, Isırlık Nature Park is 21.5 km away, Handüzü Nature Park is 12.2 km away, Uzungöl Nature Park is 25.5 km away, Kaçkar Mountains National Park is 23 km away, and Erzurum İspir Verçenik Mountain is 26.7 km away (Figures 6-7).

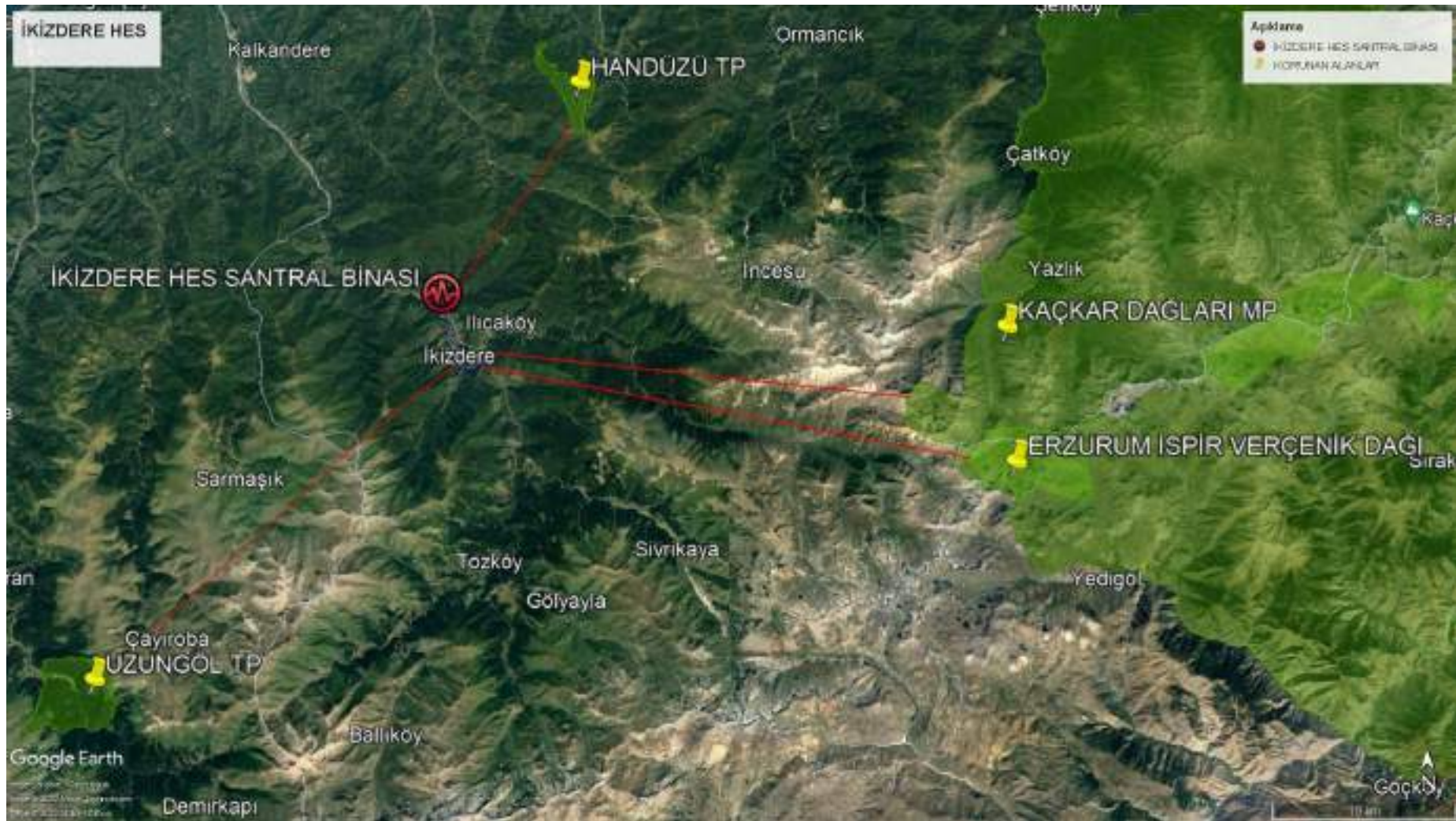


Figure 6: Satellite Image Showing the Relationship Between the Project Site and Protected Areas

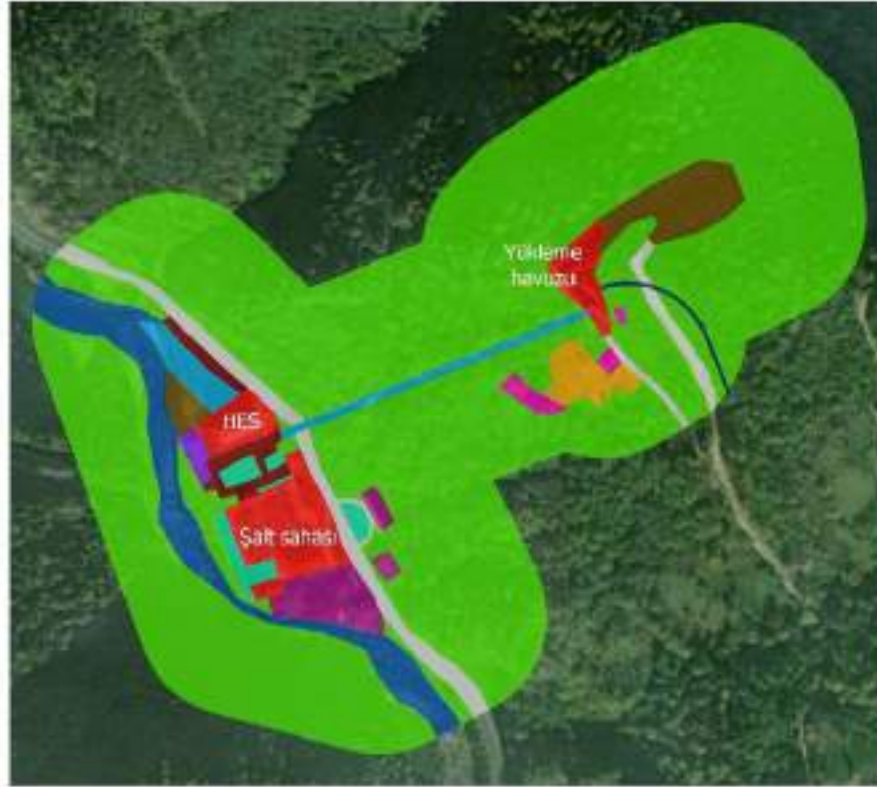


Figure 7: Satellite Image Showing the Relationship Between the Project Site and Protected Areas

1.3 Identification and Classification of Habitats in the Impact Area of İkizdere Regulator and HEPP Facility

Zorlu Doğal Elektrik Üretimi A.Ş. operates the İkizdere Hydroelectric Power Plant (HEPP) facility, which is located on İkizdere (İyidere downstream) within the borders of the Eastern Black Sea Basin, Rize Province, İkizdere District, and on the Tortum G45-a4 sheet of the 1/25,000 scale Topographic Map.

There are 12 different habitat types in the project area. 5 of these habitats are natural and the remaining 7 have modified habitat characteristics. The 1st, 2nd and 3rd Level codes and vegetation types of the vegetation types that develop in natural areas according to the EUNIS Habitat Classification are given below (Figure 8-10)



İkizdere HES EUNIS Habitat Haritası 1

Ölçek: 1:6,000

- ** Tesis binaları
- * C2.2: Mevsimsel olmayan, hızlı akan akarsular
- ** E2.64: Çimlik alanlar, park çimlikleri
- * G4: Kaşık ormanlar
- * H5: Bitki örtüsü seyrek açık alanlar
- ** I1.3: Yoğun olmayan tarımsal yöntemlerle yetiştirilen ürünlerin ekili olduğu tarım alanları
- ** J2.1: Kırsaldaki dağınık konutlar
- ** J2.3: Kırsaldaki aktif kullanılan endüstriyel yapılar
- ** J4.2: Yol ağları
- ** J4.6: Kaldırımlar, beton yüzeyler, rekreasyon alanları
- ** J5.41: İnsan yapımı tatlı su kanalları
- ** J5.43: İnsan yapımı yeraltı tatlı su kanalları
- ** J6.5: Endüstriyel atık depolama sahası

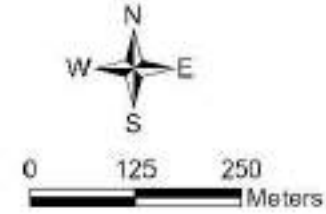
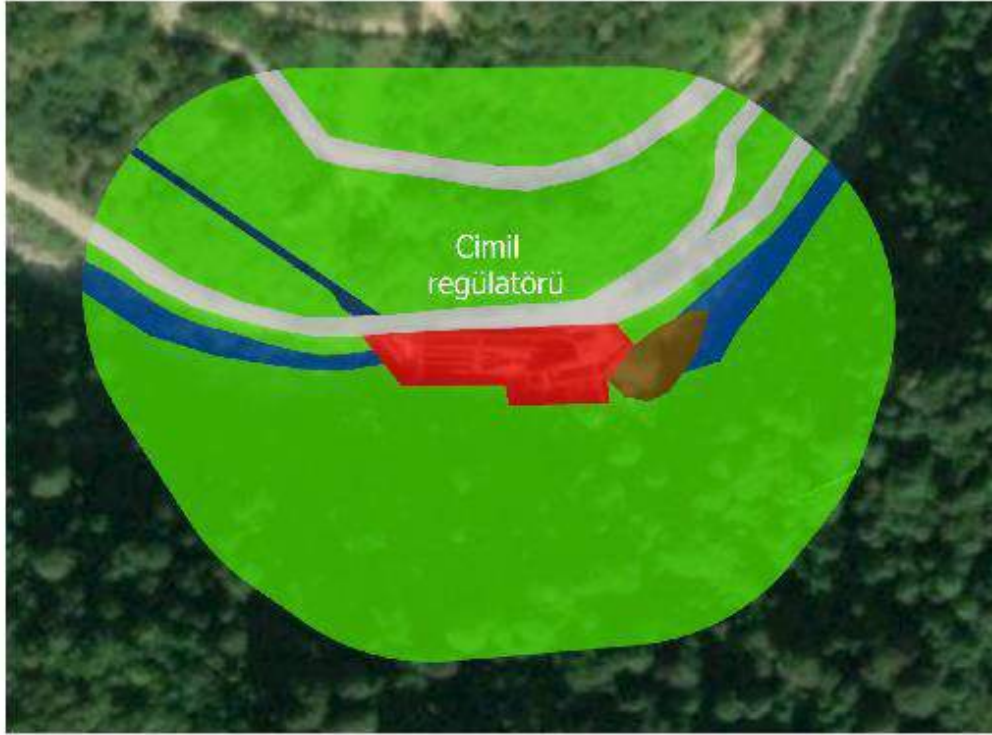


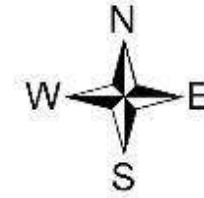
Figure 8: İkizdere HPP EUNIS Habitat Map 1



İkizdere HES EUNIS Habitat Haritası 2

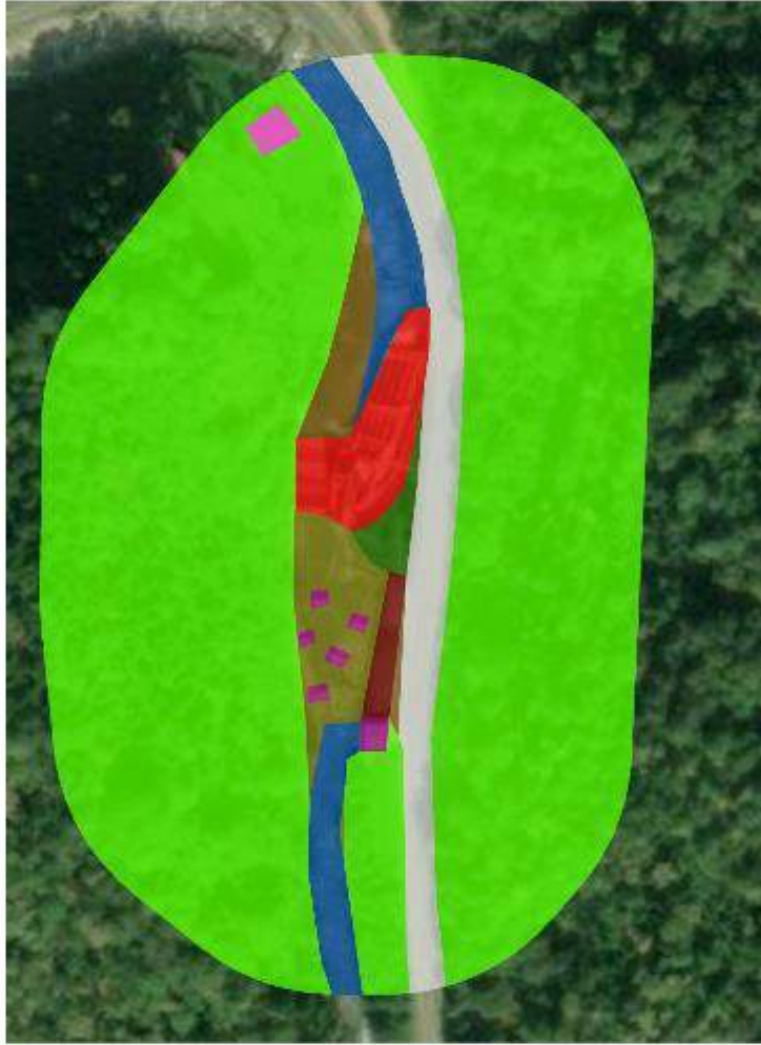
Ölçek: 1:4,000

- ** ■ Tesis binaları
- * ■ C2.2: Mevsimsel olmayan, hızlı akan akarsular
- * ■ G4: Karışık ormanlar
- * ■ H5: Bitki örtüsü seyrek açıklık alanlar
- ** ■ J4.2: Yol ağları
- ** ■ J5.43: İnsan yapımı yeraltı tatlı su kanalları



0 110 220
Meters

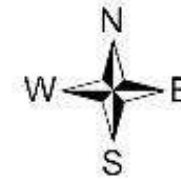
Figure 9: İkizdere HPP EUNIS Habitat Map 2



İkizdere HES EUNIS Habitat Haritası 3

Ölçek: 1:4,000

- ** ■ Tesis binaları
- * ■ C2.2 : Mevsimsel olmayan hızlı akan akarsular
- * ■ E3 : Islak çayırlar, mevsimsel ıslak çayırlar
- * ■ G4 : Karışık ormanlar
- * ■ G5 : Antropojenik ormanlar, baltalıklar, ağaç sıraları
- * ■ H5 : Bitki örtüsü seyrek açıklik alanlar
- ** ■ J2.1 : Kırsaldaki aktif kullanılan dağınık konutlar
- ** ■ J2.3 : Kırsaldaki aktif kullanılan endüstriyel yapılar
- ** ■ J4.2 : Yol ağları
- ** ■ J4.6: Kaldırımlar, beton yüzeyler, rekreasyon alanları



0 75 150
Meters

Figure 10: İkizdere HPP EUNIS Habitat Map 3

➤ Natural habitats

H5 Herb Cover Rare Openness Fields

In open areas at an altitude of 650-700 m; *polygala anatolica* , *Silene compacta* , *Eryngium giganteum* , *Logfia arvensis* , *Aster caucasicus* , *Doronicum balansae* , *Lapsana communis* subsp . *intermedia* , *Salix caprea* , *Carex caryophyllea* , *Carex caryophyllea* , *Cicerbita racemosa* , *Rhinanthus angustifolius* subsp . *grandiflorus* .

C2.2 seasonal Non, Fast Flowing Streams

Characteristic taxa of riparian habitats that form the streamside vegetation flowing throughout the year at an altitude of 480 m ; *alnus glutinosa* , *Arenaria rotundifolia* subspecies *rotundifolia* , *Hypericum androsaemum* , *Geranium pyrenaicum* , *Padus avium* , *filipendula ulmaria* , *Alchemilla retinervis* , *Epilobium colchium* , *Epilobium palustre* , *Saxifraga cymbalaria* var. *cymbalaria* , *Parnassia palustris* , *Chaerophyllum angelicifolium* , *Ligusticum alatum* , *Cephalaria gigantea* , *Cirsium arvense* subsp . *vestitum* , *Primula elatior* subsp . *pseudoelatior* , *Primula auriculata* , *Periploca graeca* var. *graeca* , *Centaureum erythraea* subsp . *turcicum* , *Solanum dulcamara* , *Scrophularia nodosa* , *Veronica anagallis-aquatica* subsp . *anagallis -aquatica* , *Odontites glutinosa* , *Pedicularis wilhelmsiana* , *Rhynchocorys elephas* subsp . *is elephas* .



Photos 1: Habitats with Surface Fluidity (EUNIS: C2.2)

G5. anthropogenic with character coppice Forests

G4 habitat in the code plant taxa closedness broken aspect This area They are valid in .

G4 Mixed Forests

These communities seen at an altitude of 500 m; *fagus orientalis* , *Picea orientalis* , *Castanea sativa* *Carpinus orientalis* , *Lycopodium clavatum* , *Osmunda regalis* , *Athyrium filix-foemina* , *Aconitum orientale* , *Cardamine bulbifera* , *Viola reichenbachiana* , *Geranium asphodeloides* subsp . *asphodeloides* , *Vicia crocea* , *Trifolium* There is medium . medium , *Laurocerasus officinalis* , *Epilobium montanum* , *Oenanthe pimpinelloides* , *Heracleum sphondylium* subsp . *cyclocarpum* .



Photos 2 Mixed Forests (EUNIS:G 4)

H5 Herb Cover Rare Openness Fields

In open areas at an altitude of 650-700 m; *polygala anatolica* , *Silene compacta* , *Eryngium giganteum* , *Logfia arvensis* , *Aster caucasicus* , *Doronicum balansae* , *Lapsana communis* subsp . *intermedia* , *Salix caprea* , *Carex caryophyllea* , *Carex caryophyllea* , *Cicerbita racemosa* , *Rhinanthus angustifolius* subsp . *grandiflorus* .

E3 Wet meadows, seasonal Wet meadows

In these streamside habitats observed at an altitude of 500 m; *Ranunculus constantinopolitanus* , *Thalictrum minus* var. *majus* , *Draba nemorosa* , *Cardamine impatiens* var. *pectinata* , *Myosoton aquaticum* , *Vicia cracca* subsp . *cracca* , *Chaerophyllum angelicifolium* , *Heracleum apiifolium* , *Inula orientalis* , *Gnaphalium luteo-album* subspecies *leuto-album* , *Conyza canadensis* plant taxa are widespread.

➤ Modified Habitats

J2.1, J2.3, Areas with habitat codes J4.2, J4.6, J5.41, J5.43, J6.5 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. Care should be taken to ensure that only the plants used for landscaping and food purposes in the E2.64, J4.6 and I1.3 coded habitats are not invasive species.



Photos 3 in the countryside Active Used Industrial Buildings (EUNIS: J2.3)



Photos 4 Path networks With sidewalks And Recreation Fields (EUNIS: J4.2 And J4.6)



Photos 5 Person making Salty Non This channels (EUNIS: J5.41)



Photos 6 Person making Underground Stream lines (EUNIS: J5.43)



Photos 7 *alnus glutinosa*



Photos 8 *Carpinus orientalis*



Photos 9: *polygala anatolica*

When looking at the vegetation structure of the project site and its surroundings; It is a regulator and HEPP facility , a large part of which is settled in mixed deciduous and coniferous forests and has become compatible with the habitats over time . While it creates a riparian vegetation zone around the constantly fluid stream bed , there are grassy fields created as a result of constructions and landscaping activities created as a result of andropogenic activities in non-natural habitats .

➤ **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 .

In the examinations and studies conducted, İkizdere No special habitat types were found in the HEPP area. 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 İkizdere HEPP area where observations were made are in Table 1. has been given.

Table 1: İkizdere HEPP aquatic habitat And Features

EUNIS CODE	HABITAT NAME	FEATURES	RAID SPECIES
C2	surface streams	in the field Other Continuous 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 the hornbill (<i>Chondrostoma regium</i>), fresh water mullet (<i>Squalius cephalus</i>) type diversity more is too much.

The stream bed generally looks like a natural habitat (Photo 11). The deteriorated habitat structures around İkizdere HEPP have adapted to the natural environment since there has been no external influence to date .



Photos 10 İkizdere HEPP in the field Exit juice around Semi-Natural habitat Structure



Photos 11th İkizdere HEPP of the field Natural habitat Structure

1.4 İkizdere HEPP facility Effect in the field floristic Defining Biodiversity

When we look at the vegetation structure of the project site and its surroundings; It is a regulator and HEPP facility , a large part of which is settled in mixed deciduous and coniferous forests and has become compatible with the habitats over time . While it creates a riparian vegetation zone around the constantly fluid stream bed , there are grassy fields created as a result of constructions and landscaping activities created as a result of andropogenic activities in non-natural habitats .

IFC PS-6 and Guidance in terms of floristics in the project area Considering the Note 6 criteria, no plant taxon or habitat containing it has been found with CR and EN status according to IUCN , within the scope of the Bern Convention and its annexes, the CITES convention and its annexes . All areas, except the untouched natural areas around the facility's session area and the man-made construction areas that have been integrated over time, have integrated with the natural areas by creating an integrated transition zone .

1.5 İkizdere HEPP facility Effect in the field faunistic biodiversity Definition

1.5.1 Amphibian

that are and are likely to be found in the project area are listed and critical species are given in the report. There are no endangered and/or endemic amphibian species in the project area. Amphibian species found in the area are common species. During field work abundant *Pelophylax ridibundus* (Lowland frog) was observed. The region is also **home to the Caucasian newt (*Mertensiella caucasica*)** is also located in its distribution area. The Caucasian salamander is a vulnerable species and is listed as **VU** (Vulnerable) by the IUCN.

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

One of the endemic reptile species that may be found in the project area is the Baran viper (*Vipera barani*) . The IUCN criterion for the species is listed as NT . This species is directly dependent on water One type is not there And my species project in the field possible to their habitats project by One Since no harm was done, no negative impact on the species was observed.

Apart from this, there is no endangered or endemic reptile species in the project area .

are *Natrix* , which are partially or largely water-dependent reptile species. *tessellata* and *Natrix natrix* . The impact of these species may be due to the decrease in water in the stream bed due to not enough water being released into the stream bed. However, since the amount of lifewater released into the stream bed is at a very good level, no negative impact on these species has been observed in the current situation.

Criterion 1: Refers to Critically Endangered (CR) and /or Endangered (EN) Species. **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. It refers to Endemic and/or Narrowly Ranged Species. Baran viper (*Vipera*) , which is endemic to the project area barani) is widespread. The distribution area of this endemic species is more than 50,000 square kilometers. (km^2) is too much. To say that the project site is an area that regularly harbors $\geq 10\%$ of the global population size of that species and ≥ 10 breeding units of a species. It is not possible. In this regard, according to the available information, **the threshold value for Criterion 2 of the project site is does not meet.**

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

There is no endemic or endangered mammal species in the project region that will be directly negatively affected by the project. The mammal species most likely to be affected by the project is the Otter (*Lutra lutra*) . Since it feeds in water, if not enough water is released into the stream bed, there may be a possibility of negative effects as the amount of water in the feeding areas and the amount of fish that make up its food may decrease . However, since the amount of stream used in the project was quite high, it was observed that plenty of water was released into the stream bed. The IUCN criterion for the otter is NT and it is likely to be found in the region.

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 .

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 areas 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 connection also extends across elevation and climate gradients and across crest-to- coast to coast)” also includes biological corridors.

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 İkizdere 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 a large number of 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 103 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 2 below.

Two of the species found around the facility are threatened on a global scale. These species are Turtle Dove (*Streptopelia turtur*) and the steppe eagle (*Aquila nipalensis*) . Of these species, the stepmother (*Streptopelia turtur*) global Red List status “VU” vulnerable, Steppe Eagle (*Aquila nipalensis*) "EN" has been identified as endangered. Of the species found around the facility, 76 are in BERN Agreement Annex-2, 14 are in BERN Agreement Annex-3, 2 are in CITES Annex-1, 11 are in CITES Annex-1 and 11 are in CITES Annex-2. is also located .

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

Habitats Important to Critically Endangered (CR) or Endangered (EN) Species

Aquila) spotted near the facility *nipalensis*) is a migratory species in the region and is seen during migration times in the region (Kirwan et al., 2008). The species nests and hunts in open steppe areas (Cramp , 1977 ; Kirwan et al., 2008). It is an important place for this species in the region. It is not considered to be habitat and therefore this criterion is not triggered.

Criterion 2: endemic And Narrow widespread Species For Important Habitats

Facility birds around This criterion It does not trigger.

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

The study area does not differ significantly from the surrounding region in terms of elevation, moisture gradients , or any other geological, ecological, or evolutionary factor that indicates the region was vital for sustaining unique or distinctive evolutionary processes. Therefore, none of the habitats around the facility trigger Criterion 5.

Table 2: Project in the field Found and Finding Likely Bird Species

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Accipiter gentilis</i>	Northern Goshawk	Not endemic	LC	Annex 2	KD	Annex 2
<i>Accipiter nisus</i>	Eurasian Sparrowhawk	Not endemic	LC	Annex 2	KD	Annex 2
<i>Acrocephalus palustris</i>	Marsh Warbler	Not endemic	LC	Annex 2	KD	KD
<i>Actitis hypoleucos</i>	Common Sandpiper	Not endemic	LC	Annex 2	KD	KD
<i>Aegithalos caudatus</i>	Long-tailed Tit	Not endemic	LC	Annex 3	KD	KD
<i>Aegypius monachus</i>	Cinereous Vulture	Not endemic	LC	Annex 2	KD	KD
<i>Anthus spinoletta</i>	Water Pipit	Not endemic	LC	Annex 2	KD	KD
<i>Anthus trivialis</i>	Tree Pipit	Not endemic	LC	Annex 2	KD	KD
<i>Aquila chrysaetos</i>	Golden Eagle	Not endemic	LC	Annex 2	KD	Annex 2
<i>Aquila nipalensis</i>	Steppe Eagle	Not endemic	MOST	Annex 2	KD	Annex 2
<i>Ardea cinerea</i>	Grey Heron	Not endemic	LC	Annex 3	Annex 1	KD
<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>Calandrella brachydactyla</i>	Greater Short-toed Lark	Not endemic	LC	Annex 2	KD	KD
<i>Carduelis carduelis</i>	European Goldfinch	Not endemic	LC	Annex 2	KD	KD
<i>Carpodacus erythrinus</i>	Common Rosefinch	Not endemic	LC	Annex 2	KD	KD
<i>Certhia brachydactyla</i>	Short-toed Treecreeper	Not endemic	LC	Annex 2	KD	KD
<i>Certhia familiaris</i>	Eurasian Treecreeper	Not endemic	LC	Annex 2	KD	KD
<i>Cettia cetti</i>	Cetti's Warbler	Not endemic	LC	Annex 2	KD	KD
<i>Chloris chloris</i>	European Greenfinch	Not endemic	LC	Annex 2	KD	KD
<i>Cinclus cinclus</i>	White-throated Dipper	Not endemic	LC	Annex 2	KD	KD
<i>Clanga pomarina</i>	Lesser Spotted Eagle	Not endemic	LC	Annex 2	KD	Annex 2
<i>Coccothraustes coccothraustes</i>	Hawfinch	Not endemic	LC	Annex 2	KD	KD
<i>Columba livia</i>	Rock Dove	Not endemic	LC	Annex 3	Annex 2	KD

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Columba oenas</i>	Stock Dove	Not endemic	LC	Annex 2	Annex 1	KD
<i>Coracias garrulus</i>	European Roller	Not endemic	LC	Annex 2	KD	KD
<i>Corvus corax</i>	Common Raven	Not endemic	LC	Annex 3	Annex 1	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>Coturnix coturnix</i>	Common Quail	Not endemic	LC	Annex 3	Annex 2	KD
<i>Crex crex</i>	Corn Crake	Not endemic	LC	Annex 2	KD	KD
<i>Cuculus canorus</i>	Common Cuckoo	Not endemic	LC	Annex 3	KD	KD
<i>Cyanistes caeruleus</i>	Eurasian Blue Tit	Not endemic	LC	Annex 2	KD	KD
<i>Delichon urbicum</i>	Common House Martin	Not endemic	LC	Annex 2	KD	KD
<i>Dendrocopos major</i>	Great Spotted Woodpecker	Not endemic	LC	Annex 2	KD	KD
<i>Emberiza cia</i>	Rock Bunting	Not endemic	LC	Annex 2	KD	KD
<i>Emberiza hortulana</i>	Ortolan Bunting	Not endemic	LC	Annex 3	Annex 1	KD
<i>Eremophila alpestris</i>	Horned Lark	Not endemic	LC	Annex 2	KD	KD
<i>Erithacus rubecula</i>	European Robin	Not endemic	LC	Annex 2	KD	KD
<i>Falco subbuteo</i>	Eurasian Hobby	Not endemic	LC	Annex 2	KD	Annex 2
<i>Falco tinnunculus</i>	Common Kestrel	Not endemic	LC	Annex 2	KD	Annex 2
<i>Fringilla coelebs</i>	Chaffinch	Not endemic	LC	Annex 3	Annex 1	KD
<i>Garrulus glandarius</i>	Eurasian Jay	Not endemic	LC	KD	Annex 2	KD
<i>Gypaetus barbatus</i>	Bearded Vulture	Not endemic	NT	KD	KD	KD
<i>Hieraetus pennatus</i>	Booted Eagle	Not endemic	LC	Annex 2	KD	Annex 2
<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 collurio</i>	Red-backed Shrike	Not endemic	LC	Annex 2	Annex 1	KD

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Lanius minor</i>	Lesser Grey Shrike	Not endemic	LC	Annex 2	KD	KD
<i>Larus michahellis</i>	Yellow-legged Gull	Not endemic	LC	Annex 3	Annex 1	KD
<i>Linaria cannabina</i>	Common Linnet	Not endemic	LC	Annex 2	KD	KD
<i>Linaria flavirostris</i>	Twite	Not endemic	LC	Annex 2	KD	KD
<i>Loxia curvirostra</i>	Red Crossbill	Not endemic	LC	Annex 2	KD	KD
<i>Luscinia megarhynchos</i>	Common Nightingale	Not endemic	LC	Annex 2	KD	KD
<i>Lyrurus mlokosiewiczii</i>	Caucasian Black Grouse	Not endemic	LC	KD	KD	Annex 1
<i>Melanocorypha bimaculata</i>	Bimaculated Lark	Not endemic	LC	Annex 2	KD	KD
<i>Merops apiaster</i>	European Bee-eater	Not endemic	LC	Annex 2	KD	KD
<i>Milvus migrans</i>	Black Kite	Not endemic	LC	Annex 2	KD	KD
<i>Monticola saxatilis</i>	Rufous-tailed Rock Thrush	Not endemic	LC	Annex 2	KD	KD
<i>Monticola solitarius</i>	Blue Rock Thrush	Not endemic	LC	Annex 2	KD	KD
<i>Montifringilla nivalis</i>	White-winged Snowfinch	Not endemic	LC	Annex 2	KD	KD
<i>Motacilla alba</i>	White Wagtail	Not endemic	LC	Annex 2	KD	KD
<i>Motacilla cinerea</i>	Grey Wagtail	Not endemic	LC	Annex 2	KD	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>Parus major</i>	Great Tit	Not endemic	LC	Annex 2	KD	KD
<i>Passer domesticus</i>	House Sparrow	Not endemic	LC	KD	Annex 2	KD
<i>Perdix perdix</i>	Grey Partridge	Not endemic	LC	Annex 2	KD	KD
<i>Periparus ater</i>	Coal Tit	Not endemic	LC	Annex 2	KD	KD
<i>Phoenicurus ochruros</i>	Black Redstart	Not endemic	LC	Annex 2	KD	KD
<i>Phoenicurus phoenicurus</i>	Common Redstart	Not endemic	LC	Annex 2	KD	KD
<i>Phylloscopus collybita</i>	Common Chiffchaff	Not endemic	LC	Annex 2	KD	KD
<i>Phylloscopus nitidus</i>	Green Warbler	Not endemic	LC	KD	KD	KD

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Phylloscopus sindianus</i>	Mountain Chiffchaff	Not endemic	LC	KD	KD	KD
<i>Pica pica</i>	Eurasian Magpie	Not endemic	LC	KD	Annex 2	KD
<i>Prunella collaris</i>	Alpine Accentor	Not endemic	LC	Annex 2	KD	KD
<i>Prunella modularis</i>	Dunnoek	Not endemic	LC	Annex 2	KD	KD
<i>Prunella ocularis</i>	Radde's Accentor	Not endemic	LC	Annex 2	KD	KD
<i>Ptyonoprogne rupestris</i>	Eurasian Crag Martin	Not endemic	LC	Annex 2	KD	KD
<i>Pyrrhonorax graculus</i>	Alpine Chough	Not endemic	LC	Annex 2	KD	KD
<i>Pyrrhonorax pyrrhonorax</i>	Red-billed Chough	Not endemic	LC	Annex 2	KD	KD
<i>Pyrrhula pyrrhula</i>	Eurasian Bullfinch	Not endemic	LC	KD	Annex 1	KD
<i>Regulus ignicapilla</i>	Firecrest	Not endemic	LC	Annex 2	KD	KD
<i>Regulus regulus</i>	Goldcrest	Not endemic	LC	Annex 2	KD	KD
<i>Rhodopechys sanguineus</i>	Trumpeter Finch	Not endemic	LC	KD	Annex 1	KD
<i>Saxicola rubicola</i>	European Stonechat	Not endemic	LC	Annex 2	KD	KD
<i>Scolopax rusticola</i>	Eurasian Woodcock	Not endemic	LC	Annex 3	Annex 2	KD
<i>Serinus pusillus</i>	Red-fronted Serin	Not endemic	LC	Annex 2	KD	KD
<i>Serinus serinus</i>	European Serin	Not endemic	LC	Annex 2	KD	KD
<i>Sitta europaea</i>	Eurasian Nuthatch	Not endemic	LC	Annex 2	KD	KD
<i>Sitta krueperi</i>	Krüper's Nuthatch	Not endemic	NT	Annex 2	KD	KD
<i>Spinus spinus</i>	Eurasian Siskin	Not endemic	LC	Annex 2	KD	KD
<i>Streptopelia turtur</i>	European Turtle Dove	Not endemic	VU	Annex 3	Annex 2	KD
<i>Strix aluco</i>	Tawny Owl	Not endemic	LC	Annex 2	KD	Annex 2
<i>Sylvia atricapilla</i>	Blackcap	Not endemic	LC	Annex 2	KD	KD
<i>Tetraogallus caspius</i>	Caspian Snowcock	Not endemic	LC	KD	KD	Annex 1
<i>Tringa ochropus</i>	Green Sandpiper	Not endemic	LC	Annex 2	KD	KD
<i>Troglodytes troglodytes</i>	Eurasian Wren	Not endemic	LC	Annex 2	KD	KD

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Turdus merula</i>	Common Blackbird	Not endemic	LC	Annex 3	Annex 2	KD
<i>Turdus philomelos</i>	Song Thrush	Not endemic	LC	Annex 3	Annex 2	KD
<i>Turdus torquatus</i>	Ring Ouzel	Not endemic	LC	Annex 2	KD	KD
<i>Turdus viscivorus</i>	Mistle Thrush	Not endemic	LC	Annex 3	Annex 1	KD

1.1 Identification of Hydrobiological Biodiversity in the Impact Area of İikizdere Regulator and HEPP Facility

Project area in 4 separate alga to class belonging to total 78 taxon (type And subspecies) diagnosis has been made. Especially the Bacillariophyta (diatom) group of algae has become the richest class in terms of diversity. 52 taxa belonging to this class, 12 belonging to Chlorophyta , 11 belonging to Cyanophyta and 1 taxon belonging to Euglenophyta were found.

Project in the field, sampling stations built in all also raid class Bacillariophyta (Diatom) aspect has been found. of the region type diversity in terms of second raid group Chlorophyta And Cyanophyta is coming. This taxa Turkey's A lot from locality record reported as is wide One It has distribution. Chlorophyta belonging to species in Spirogyra sp. type comes to the fore. The most dominant species of the Cyanophyta class is Oscillatoria sp. has happened. Species belonging to this genus have a very wide distribution profile. Dinophyta and Euglenophta classes were found in very few numbers in terms of species number and density. General aspect diagnosis made freshwater alga species all cosmopolitan is to the region There are no specific endemic, rare or endangered species.

During the examinations carried out in the project area, a total of 13 taxa belonging to Rotifera and Copepoda, which are groups that constitute zooplanktonic organisms, were identified. The most dominant group of these is the Rotifera group. Rotifera While there are 12 taxa belonging to the phylum Brachionus calyciflorus and Keratella cochlearis species are dominant. One taxon was identified from Copepoda and it was Cyclops sp. was found to be important in this group. The main factors affecting the distribution of zooplankton in freshwater systems can be classified as food, competition, mechanical relations with other living things, predation and parasitism, as well as the physical and chemical properties of the water. Depending on temperature, environmental Changes in factors affect the distribution of zooplanktonic organisms (Wetzel, 1983, Herzig , 1984). zooplankton Another important factor affecting community structure is predation . Many invertebrates and fish feed on Rotifera at least during a certain period of their lives (Herzig , 1980). In addition, current provides a disadvantage in the distribution of zooplanktonic organisms.

A total of 17 benthic invertebrate species belonging to four major groups were identified according to the samples taken at 4 different stations in the study area . Of these, 2 belong to Gastropoda , 1 to Crustaceae , 1 to Crustaceae , and 13 to Insecta .

In aquatic ecosystems, benthic organisms have a significant proportion of indicator species. These creatures are also an indicator group of communities that are polluted or under stress, especially as a result of anthropogenic effects. According to the sampling results, no species that could be described as a pollution indicator was found. In addition, in high mountain waters and Gammarus , which is considered a clean water indicator and belongs to Crustacea. The taxon is known as a clean water indicator. In particular, this taxon is the dominant group in both stations and are biological indicators that indicate that the area has clean water quality.

6 fish species belonging to 3 different families have been identified in the project area. The Cyprinidae family is represented by the highest number of species (3 species).

Among the most important species of the project area is *Salmo* , belonging to the Salmonidae family. *rizensis* (*Salmo macrostigma* -Mountain Trout), *Oncorhynchus mykiss* (Rainbow Trout) species are also included. Of these, *Salmo rizensis* (*Salmo macrostigma* -Mountain Trout) is the natural species of the region, *Oncorhynchus mykiss* It is a cultured species and not a natural fish of these waters. surrounding fish from their farms fugitive individuals This to environments adapt they have been .

Among the species identified from the area, two fish species (*Ponticola*) included in the Bern (Appendix III) list *Kessleri* And *salmo rizensis*) There are. Moreover *barbus tauricus* taxon Europe to the Red List (IUCN- Red Alburnoides is in the VU (vulnerable) category according to List bipunctatus and *Ponticola kessleri* species in the LC (low risk) category and other species *Salmo rizensis* , *Oncorhynchus mykiss* and *Capoeta tinca* species are also given as unevaluated.

Salmo fish species *rizensis* (*Salmo macrostigma* -Mountain Trout) and *Capoeta tinca* species are considered endemic. The distribution of these species in Turkey is in the river basins of the Central and Eastern Black Sea . They are not widespread endemic species.

Table 3 Project Area And Around belonging Alga Types

BACILLARIOPHYTA	<i>Melosira varians</i>	CYANOPHYTA
<i>cyclotella meneghiniana</i>	<i>meridion circulare</i>	<i>Chroococcus limneticus</i>
<i>cyclotella ocellata</i>	<i>Navicula arenaria</i>	<i>gomphosphaeria aponina</i>
<i>Melosira varians</i>	<i>N. bacillum</i>	<i>lyngbya aerugineo - caerulea</i>
<i>Achnanthes minutissima</i>	<i>N. cryptocephala</i>	<i>nostoc commune</i>
<i>amphora ovalis</i>	<i>N. cryptocephala there is. intermedia</i>	<i>Oscillatoria amphibia</i>
<i>A. ovalis there is. pediculus</i>	<i>N. cryptocephala there is. Veneta</i>	<i>HE. curviceps</i>
<i>anomoeoneis sphaerophora</i>	<i>N. radiosa</i>	<i>HE. limnetica</i>
<i>aulacoseria granulate</i>	<i>N. rhynchocephala</i>	<i>HE. limosa</i>
<i>caloneis permagna</i>	<i>Nitzschia constricta</i>	<i>HE. subbrevis</i>
<i>ceratoneis arcus</i>	<i>Nitzschia hungarica</i>	<i>HE. tenuis</i>
<i>C. arcus there is. amphioxys</i>	<i>Nitzschia palea</i>	<i>spirulina major</i>
<i>coconeis placenta</i>	<i>Nitzschia sigmoidae</i>	EUGLENOPHYTA
<i>cyclotella meneghiniana</i>	<i>Rhopalodia gibba</i>	<i>Euglena oxyuris</i>
<i>Cymatopleura solea</i>	<i>surirella angustate</i>	
<i>Cymbella affinis</i>	<i>S. linearis</i>	
<i>Cymbella cistula</i>	<i>S. ovalis</i>	
<i>C. amphicephala</i>	<i>S. robusta</i>	
<i>C. cymbiformis</i>	<i>S. robusta there is. splendida</i>	
<i>C. prostrata</i>	CHLOROPHYTA	
<i>C. sinuata</i>	<i>Chlamydomonas sp.</i>	
<i>C. tumidula</i>	<i>Scenedesmus sp.</i>	
<i>diatom vulgare there is. brevis</i>	<i>ulothrix variabilis</i>	
<i>didymosphenia geminata</i>	<i>oedogonium sp.</i>	
<i>Epithemia Argus</i>	<i>Closterium aciculare</i>	
<i>Epithemia sorex</i>	<i>Closterium littoral</i>	
<i>Fragilaria construens</i>	<i>C. lunula</i>	
<i>F. crotonensis</i>	<i>C. parvulum</i>	
<i>Fragilaria dilatata</i>	<i>cosmarium botrytis</i>	
<i>Fragilaria ulna</i>	<i>C. laeve</i>	
<i>gyrosigma acuminatum</i>	<i>C. vexatum</i>	
<i>gomphonema constriction</i>	<i>Spirogyra sp.</i>	
	<i>G. olivaceum</i>	
	<i>hantzschia amphioxys</i>	

Table 4 Project Area And Around belonging zooplanktonic Types

ROTIFERA
<i>Ascomorpha reign</i>
<i>brachionus quadridentatus</i>
<i>brachionus calyciflorus</i>
<i>cephalodella gibba</i>
<i>Euchlanis dilatata</i>
<i>filinia longiseta</i>
<i>keratella cochlearis</i>
<i>keratella quadrata</i>
<i>Lecane luna</i>
<i>Mytilina ventralis</i>
<i>notholca acuminata</i>
<i>polyarthra dolichoptera</i>
IN COPEPO
<i>cyclops sp.</i>

Table 5 Project Area And Around belonging benthic organisms

Branch: MOLLUSIAN
Class: GASTROPODA
Set: PROSOBRANCHIATA
Family: Valvatidae
<i>Valvata piscinalis</i> Müller
Set: PULMONATA
Family: Ancyliidae
<i>Ancylus fluviatilis</i> Müller
Branch: ANNELIDA
Class: CLITELLATA
Set: HIRUDINEA
Family: Erpobdellidae
<i>Erpobdella octoculata</i> L.
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: heptageniidae
<i>heptagenia sp.</i>
Family: Ephemerellidae
<i>ephemerella ignita</i> poda
Set: PLECOPTERA
Family: perlidae
<i>perla marginate</i> Sun .
Set: COLEOPTERA
Family: Noteridae
<i>noterus clavicornis</i> (Deg .)
Family: Elmidae
<i>Elmis sp.</i>

Set: TRICHOPTERA
Family: Rhyacophilidae
rhyacophila sp.
Family: Hydropsychidae
hydropsyche sp.
Set: DIPTERA
Family: Blephariceridae
liponeura sp.
Family: Limoniidae
Eriocera sp.
Family: Simuliidae
Simulium sp.
Family: Athericidae
Atherix ibis F.
Family: chironomidae
Chironomus sp.

Table 6 Project in the field Found Fish Types And Protection Status

Family	Type And subspecies	Turkish First Name	endemism	BERN	IUCN	CITES	natural kind	exotic species
Salmonidae	<i>salmo rizensis</i> * (<i>Syn : salmo macrostigma</i>)	mountain	X	Additional III	LC	-	X	-
	<i>oncorhynchus mykiss</i>	Rainbow trout	-	-	WHA T	-	X	-
Cyprinidae	<i>alburnoides bipunctatus</i>	Dotted Pearl snapper	-	-	LC	-	X	-
	<i>barbus tauricus</i>	moustachioed Fish	-		VU	-	X	-
	<i>Capoeta tinca</i> *	denfish	-	-	WHA T	-	X	-
Gobiidae	<i>ponticola Kessleri</i>	stone eater	X	Additional III	LC		X	-

1.6 biodiversity Risk Evaluation

1.6.1 Flora

The project site and its surroundings are floristically evaluated by IFC PS-6 and Guidance. Considering the Note 6 criteria, no plant taxon with CR and EN status within the scope of the IUCN convention, no plant taxon within the scope of the Bern Convention and its annexes, no plant taxon within the scope of the CITES convention and its annexes , and no habitat containing them have been identified. Therefore, critical species and habitat assessments have not been made within the scope of IFC (IUCN, Bern and CITES conventions and their annexes). The continuity of the existence of the facility, with the way it has been used to date , has become compatible with its environment, does not make this system harmful to the habitats where it is located and does not pose a risk to the floristic structure .

1.6.1.1 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.

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, in order 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 7 Project in the field Found And Finding Likely Invader Species

<i>Acer negundo</i> (ash tree leafy maple) Areas open to andropogenic influence	
<i>agropyron repens</i> (Separate herb) Field, open area	
<i>ailanthus altissima</i> (Kokarağaç) andropogenic to the effect open spaces	
<i>amaranthus retroflexus</i> (Fox dry) Field, open area	

<i>Boreava orientalis</i> (Sariat) Field, roadside	
<i>chenopodium album</i> (While crying) Flood, flood bearings	
<i>Cirsium arvense</i> (Köygöçüren) Flood, flood bearings	
<i>conyza canadensis</i> (cypress) andropogenic to the effect open fields	

conyza bonariensis (Coyote) andropogenic to the effect open fields



conyza albida (Maplewort) andropogenic to the effect open spaces



Cuscuta campestris (Turkish) meadow-pasture habitats



<i>Lepidium draba</i> (Diġnik) andropogenic to the effect open spaces	
<i>nasturtium officinale</i> (Suteresi) streamside	
<i>Reseda lutea</i> (Love flower) Path edge, field	
<i>rumex acetocella</i> (Sorrel) Path edge, field And barren places	

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

Paspalum distichum (This discrete) This communities inside on channels



Robinia pseudoacacia (White flowering liar acacia) roadsides



Xanthium strumarium (Big Pitarak) Flood, flood bearings



Xanthium spinosum (Yellow Pitarak) Flood, flood bearings



Viscum album (Lime herb) to the trees interference



1.6.2 Fauna

IFC PS-6 and Guidance Taking into account the Note 6 criteria, the "critical species" evaluation and "critical habitat" evaluation were made in section 35 , and there are no Critical species in terms of fauna (Amphibia, Reptile, Mammal) in the region, and accordingly, there is no critical habitat .

Risk Assessment for Otter (*Lutra lutra*) : Its presence in the project area has been confirmed by project staff. There is plenty of life water in the stream bed . No direct threat to the species has been observed.

Caucasian Salamander (*Mertensiella caucasica*): The project is located in the distribution area of the Caucasian salamander in Turkey and it is likely to be found in the streams in the project area. There is plenty of life water in the stream bed . No direct threat to the species has been observed .

1.6.3 Ornithology

IFC PS-6 and Guidance Taking into account the Note 6 criteria, the "critical species" evaluation and "critical habitat" evaluation were made in chapter 5 , and there are Critical species in terms of birds in the region. This species of steppe eagle (*Aquila nipalensis*) . Attention should be paid to the actions provided in the Biodiversity Action Plan for the species in question.

1.6.4 hydrobiology

in the region fishery activities promise subject being together busy aspect It is not done.

Rivers are complex and dynamic ecosystems. By changing these areas, lotic species will be affected and reduced by the loss of breeding grounds along with significant environmental change. River species normally live and spawn in shallow places and look for such habitats after the formation of the dam lake. If they cannot find it, they face losing competition with other lentic species due to the difference in their ecological niches. After the formation of such areas in HEPP-like applications, areas where some species can live should also be protected. Aquatic species; It adapts to the living conditions in a particular river section and creates characteristic biocoenoses shaped by the change of abiotic factors along the stream (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.

Within the scope of İkizdere HEPP project, in terms of wetland ecosystem, only the existence of stream habitat is in question. 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. When viewed from this perspective, it can be seen that the streams are a lotic habitat with freshwater characteristics . However, the water collection area of the regulators that constitute the scope of this study is almost non-existent, because the incoming water is taken directly into sedimentation pools and tunnels without collecting behind the regulators. For this reason, there is a very limited area in terms of stagnant water habitat in the project area .

It is known that current environments are divided into smaller habitats that can be repeated one after another. While fast-flowing habitats (rhitron) are seen, 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 are very evident throughout the İkizdere basin and can change sequentially.

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. The project area has fast and stagnant water habitats defined as rithron and potamon . However, it has been observed that fast current areas are less represented and mostly normal and relatively slow current habitat structure is more dominant .

When the Eastern Black Sea river ecosystems are evaluated and the existing aquatic species are compared, İkizdere stream does not have a river habitat that is very different from others and has a unique sensitivity and rarity.

The steps of the existing fish passage, especially in the upper part, are filled with heavy stones, gravel and similar materials. It is necessary to pay attention to the issues given in the biodiversity action plan .

1.6.5 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 ,
- weather 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 8 .

Table 8 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. Regarding the issue dated 26.06.2021 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 history 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 004.2012 Regulation" to the provisions respect to be is required.

STAGE	SUBJECT		PRECAUTION
		Waste Battery And Accumulators	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; 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.31.08.2004 history And 25569 numbered Official in the newspaper by publishing into force entering "Waste Waste must be disposed of in accordance with the provisions of the "Battery and Accumulator Control Regulation".
		Medical Wastes	For medical waste generated within the scope of the activity; waste at the source -most member will download system establishmentof 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, 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 separatelywaste 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.
		Waste Electronic Things	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.
		Waste oils	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

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 06.06.2015 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 was determined that waste scrap materials were stored on the ground floor in the facility. Care should be taken to store scrap materials on a concrete floor.

Domestic wastewater generated within the scope of the project is subjected to package treatment and discharged to the receiving environment. In this context, within the scope of domestic wastewater generated during the operation phase , the provisions of the "Water Pollution Control Regulation", which came into force after being published in the Official Gazette No. 25687 dated 31.12.2004, must be complied with. An analysis must be made by accredited companies by applying to the MELBES system of the Ministry of Environment, Urbanization and Climate Change at the package treatment outlet. In addition, the provisions of the Water Pollution Control Regulation and the Regulation on the Protection of Drinking and Domestic Water Basins must be complied with during the operation.

Wastewater Discharge dated 003.2019 within the scope of the Environmental Permit and License Regulation , and it has been determined that it is valid until 13.11.2022. Within the scope of the Environmental Permit and License Regulation, the Wastewater Environmental Permit must be renewed. However, all provisions in the Environmental Permit Certificate must be complied with.

1.7 biodiversity Action plan

İkizdere regulator And HEPP facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
i1	Business	Fauna Conservation of Species	Project Area And surroundings	Otter (<i>Lutra lutra</i>) And the Caucasian Salamander (<i>Mertensiella</i> Training for Facility Employees About <i>Caucasica</i>) Species should be given	Biologists who are experts on the subject Training Should Be Provided by	During Operation	2023 Year May 1 time
i2	All Habitats	Fauna Conservation of Species	Project Area And surroundings	the Baran Viper and the Caucasian Nosed Viper Species Facility To its employees Education should be given	Population by Expert Biologists At the level Tracing	During Operation	2023 Year May 1 time
i3	Business	Fauna Conservation of Species	Project Area And surroundings	in the region Bear (<i>Ursus Arctos</i>) is available. Human-Bear Encounters Can Sometimes Be Dangerous. 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.	Company By	During Operation	Continually

i4	All Habitats	Invader Blocking Species	Project Area And surroundings	Investigation of Invasive Species Found in the Project Area and Surroundings Project Area And Around by watching Dismantling Plan Must Be Prepared	Population by Expert Biologists Level Monitoring	During Operation	one Year Duration in July and August

İkizdere regulator And HEPP facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
i5	Business	Fauna Conservation of Species	Project Area And surroundings	Pet Cats Should Never Be Kept 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
i6	Business	Fish Conservation of Species	Project Area	Some Fish Species Have Long Distance and Some Have Short Distance Distance Migration They are the species that can . Particularly Gene Diversity of Fish To prevent narrowing of the fish passage, cleaning And Maintenance is Important.	In the Coordination of Biologists Expert on the Subject By Company	During Operation	2023 February March Within Months
i7	All Habitats	Critical Conservation of Fauna Species	General Area	Endangered Fauna types His research particularly focused on the Steppe Eagle (<i>Aquila nipalensis</i>) Type in Project Area and Surroundings It should be investigated	Population by Expert Biologists Level Monitoring	During Operation	2 Year Duration: March- November Between

i8	Business	Preventio n of Environm ental Pollution	Project Area	Licensed in accordance with the Waste Codes for Hazardous Wastes Generated within the Business Companies Recycling /Disposal by to its facilities Must be Delivered .	Company By	During Operatio n	6 on the moon one

İkizdere regulator And HEPP facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
i9	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
i10	Business	Prevention of Environmental Pollution	Project Area	Ensuring Control of Domestic Wastewater It is necessary. In this context, from the package purification exit Environment, Ministry of Urbanization and Climate Change, analyzed by accredited companies by applying through the MELBES system. to have it done is required	Company By	During Operation	4 on the moon one

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	

KUZGUN DAM and HPP BIODIVERSITY ACTION PLAN

1.1 Introduction

Kuzgun Dam and Hydroelectric Power Plant (HEPP) is located on the Berçeme Stream within the borders of Erzurum Province in the Eastern Anatolia Region of Turkey. Kuzgun HEPP is located 45 km from Ilica District and 60 km from Erzurum Province. Kuzgun HEPP receives the required water from the reservoir formed by Kuzgun Dam. The water coming from the water intake structure through a 2.5 m diameter tunnel, a part of which is covered with steel sheet, to the Butterfly Valve, which is the main cut valve, passes through the butterfly valve, which is a control equipment, and is transmitted to the turbines through a 2.5 m diameter penstock pipe divided into four at the entrance of the power plant building.

Erzurum province, where the project is located, is located in the northeastern part of the Eastern Anatolia region, at the beginning of the Çoruh, Euphrates and Aras basins. With an area of 25,066 km², the province is surrounded by the Kargapazarı (3,288 m) and Dumlu (3,250 m) mountains and the Soğanlı mountains. The deep valleys opened by the Çoruh and its tributaries and the plains formed by them provide transportation from our province to the Eastern Black Sea provinces. From the west through the Tercan Mountains to the north through the Keşiş Mountains, from there to the Kelkit valley through the Kop Mountain and Kop Pass, to the southwest through the Sansa Strait to the Erzincan plain, and to the south of it through the Mercan Mountains to the Munzur range. In the south, through the Palandöken range, it reaches the Şakşak and Bingöl mountains and the Murat basin.

Located in the northeastern part of the Eastern Anatolia Region, it is the largest province in this region and the 4th largest province in Turkey with an area of 25,066 km². Located at the starting point of the Çoruh, Euphrates and Aras basins, the province borders Rize and Artvin to the north, Bayburt and Erzincan to the west, Bingöl and Muş to the south, Kars and Ağrı to the east, Ardahan to the northeast and Trabzon to the northwest.

Approximate bird's eye view of the project area is 2.2 km to Ağaçkent village, 3.3 km to Eşinkaya village, 5.4 km to Rizekent village, 8.8 km to Çırıklı village, 7.1 km to Kızılkale

village, 4.2 km to Karakale village, 9.4 km to Kapılı village, 12.5 km to Başkurtdere village, 14.7 km to Güllüce village, 20.3 km to Cıbalı village and 19 km to Değirmendere village, Kirik village 18.4 km, Bozan village 13.7 km, Toprakkale village 3.4 km, Akdag village 6.1 km, Cayirbasi village 16.5 km, Leylekkoy village 17.9 km, Goyuneykoy village 14.2 km, Yesilvadi village 5.7 km, Akseki village 6.5 km, Zeyrek village 9.2 km, Alacabuk village 11.8 km, Akpınar village 13,1 km , Karahan village 12 km, Incesu village 9.8 km, Karakaya village 11.3 km, Ortaören village 9.9 km, Çatak village 0.1 km, Başovacık village 2.9 km, Başkent village 5.4 km, Bingöze village 4.9 km, Akırcık village 6.8 km, Kabaktepe village 5.5 km, Kuzuluk village 3.5 km, Sırlı village 2.4 km, Ifti village 10.9 km, Elmalı village 5.7 km, Sarkunlu village 14.3 km, Eskipolat village 15.8 km, Yükarıcaören village 16.9 km, Ocak village 15.8 km, Dağdagül village 14.2 km, Kavakdere village 11.3 km, Kumluyazı village 15.6 km, Yazıpınarı village 16.2 km, Uzunyayla village 13.4 km and Arıbahçe village 14.7 km (Figure 3-5).

There are important wetlands in and around the Project site. The Project site is located on Kuzgun Dam. Aygır Lake 14.2 km, Kazan Lake 16.7 km, Kaağans Lakes 12.6 km, Kurt Stream 13.4 km, Big Lake 13.5 km, Double Lakes 14.6 km and Başyatağın Lake 11.9 km from the Project site (Figure 6 - 8).

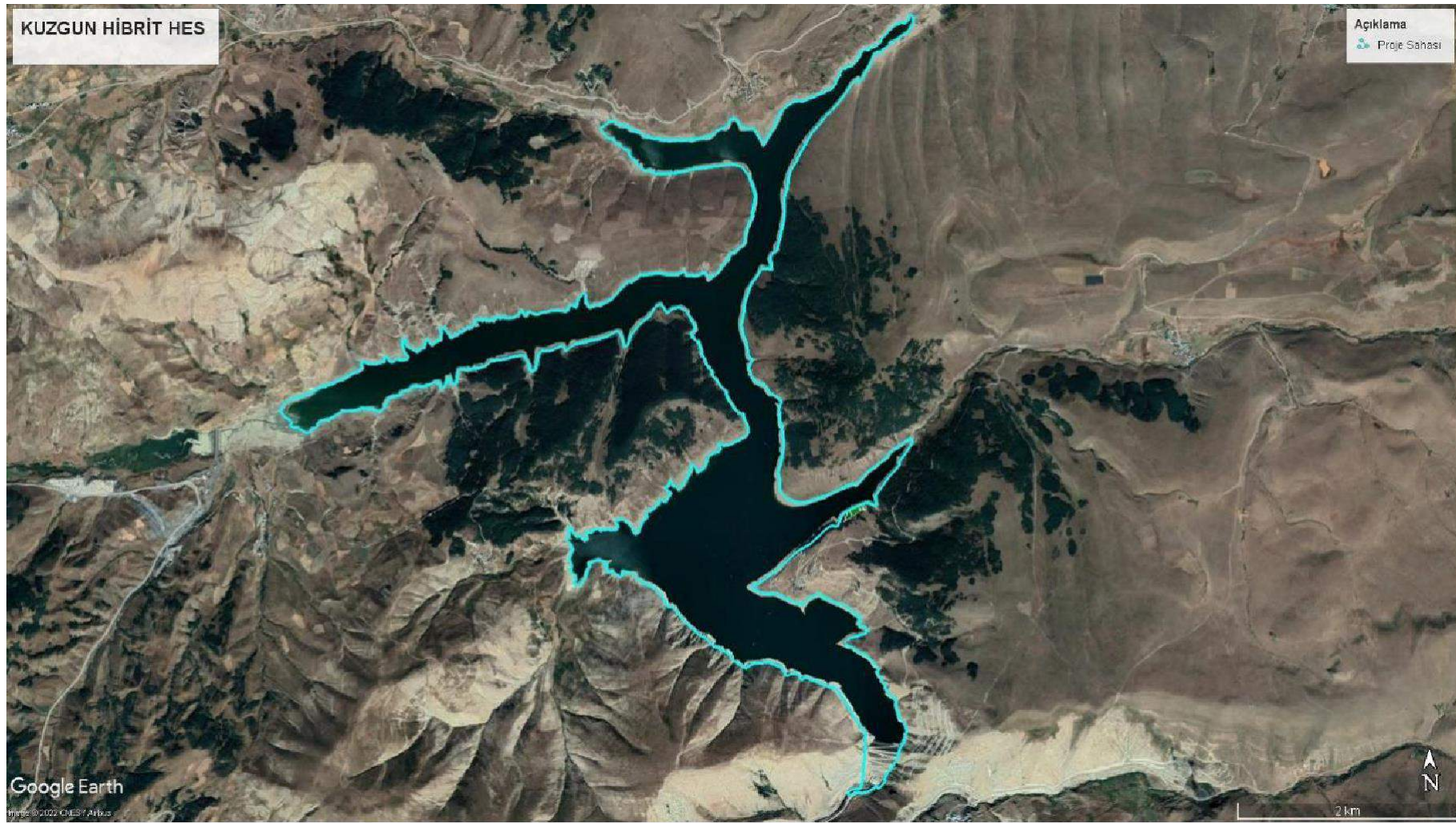


Figure 1 Satellite Image of the Project Site

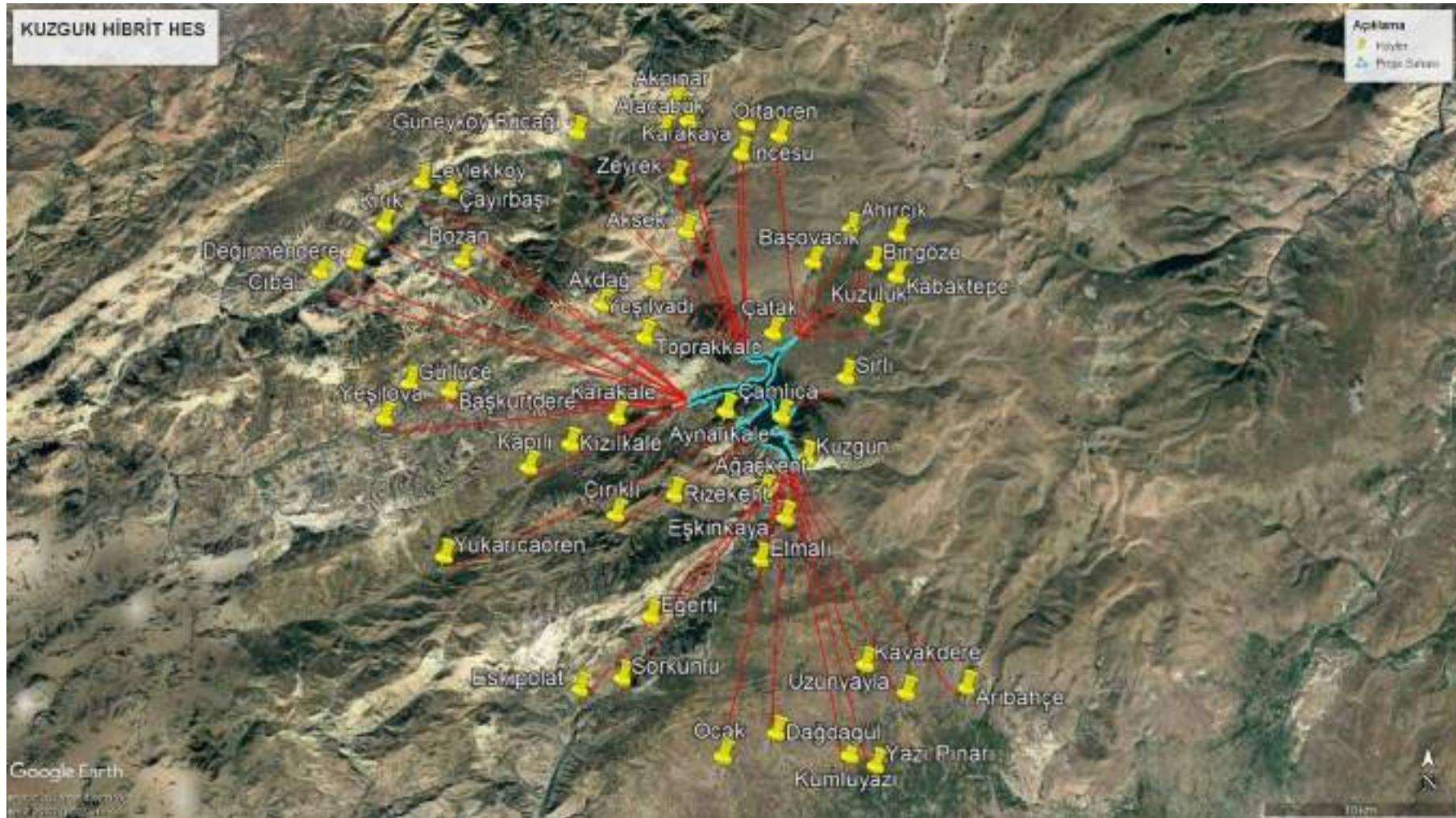


Figure 2 Village (Neighborhood) Settlements in the Vicinity of the Project Site

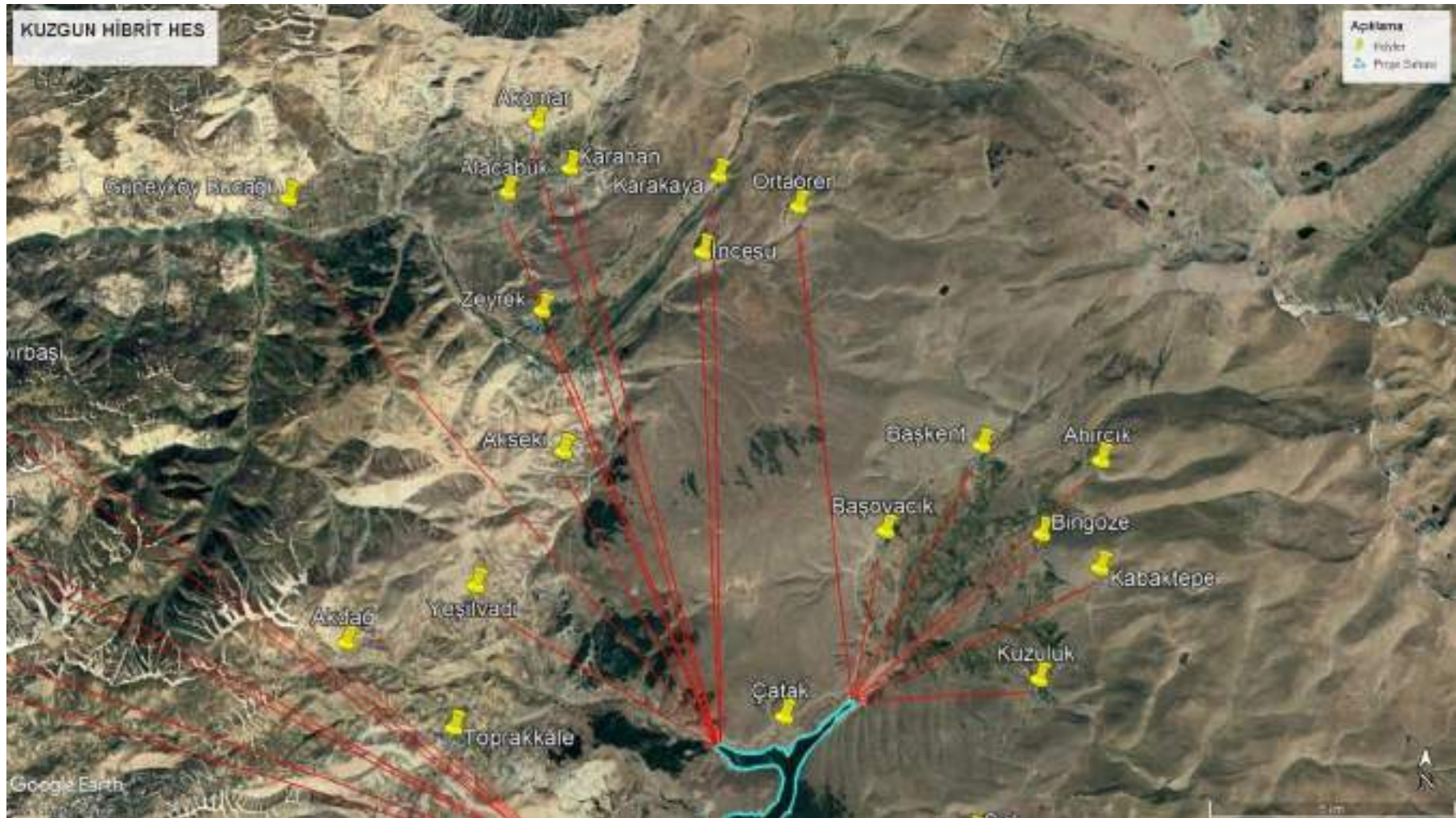


Figure 3 Village (Neighborhood) Settlements in the Vicinity of the Project Site



Figure 4 Village (Neighborhood) Settlements in the Vicinity of the Project Site

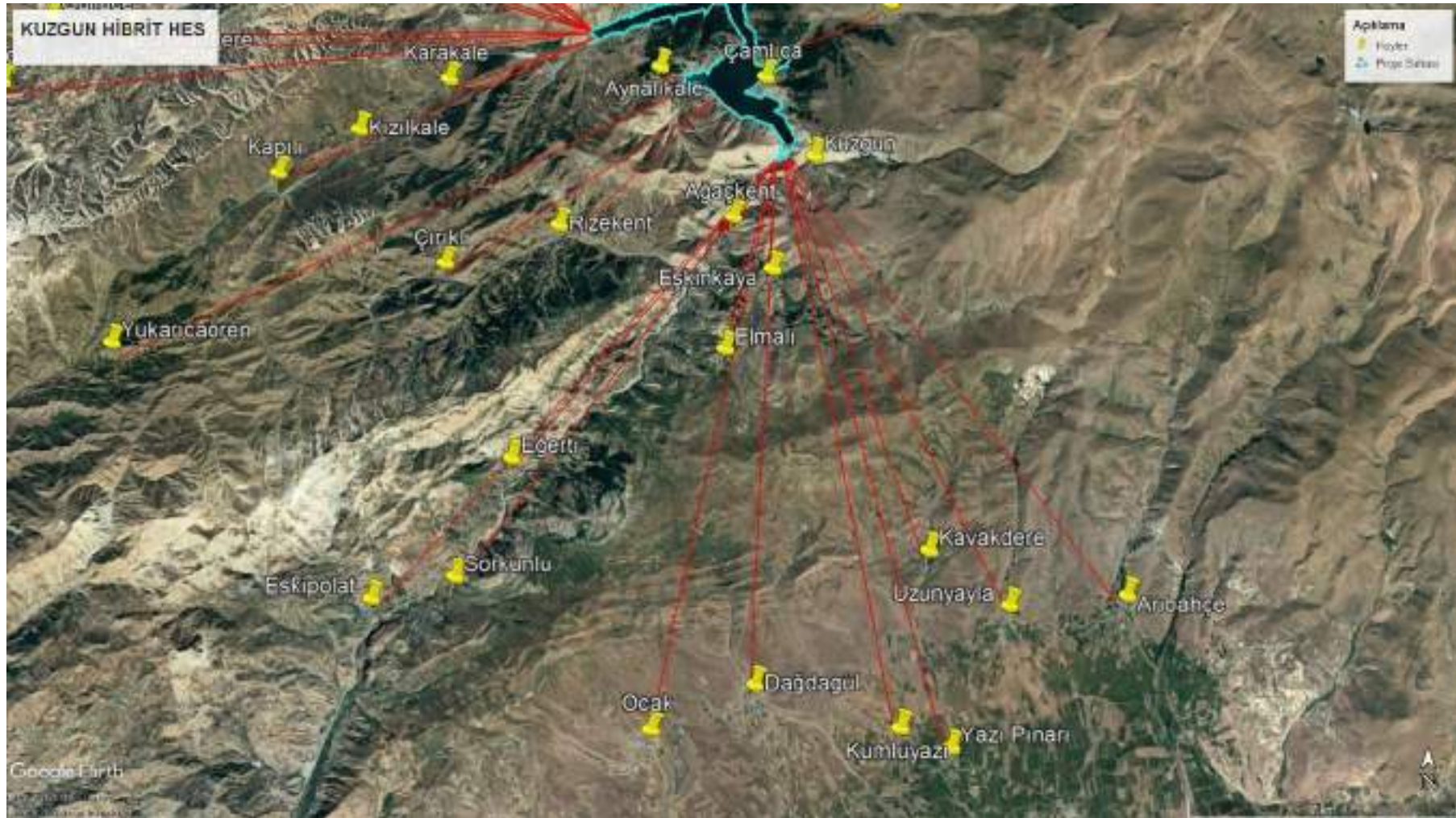


Figure 5 Settlements in the immediate vicinity of the Project Site

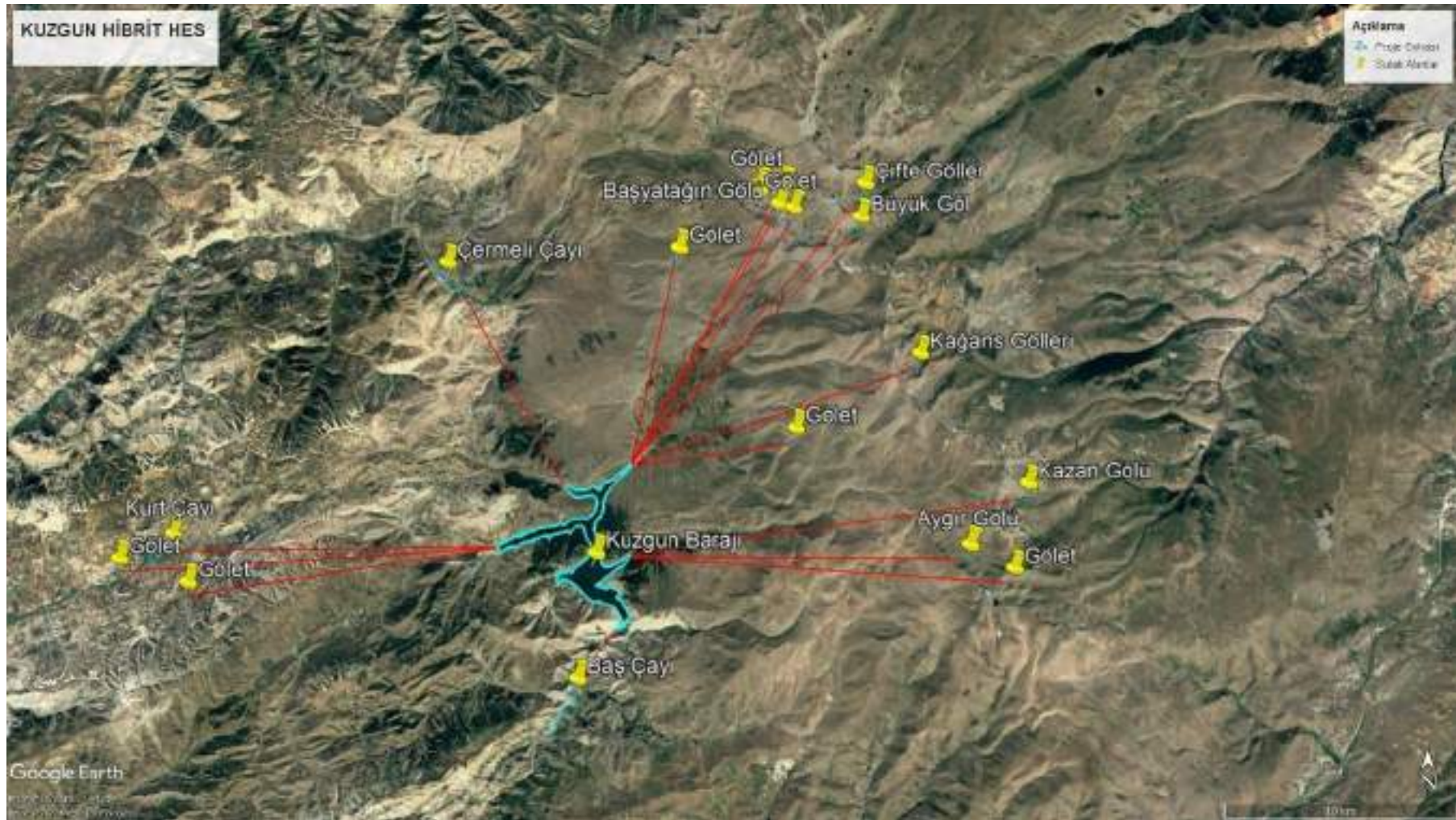


Figure 6 Important Water Bodies in the Project Environment



Figure 7 Important Water Bodies in the Project Environment



Figure 8 Important Water Bodies in the Project Environment



Figure 9 Important Water Bodies in the Project Environment

1.2 Relationship of the Area with Protected and Special Status Areas

If the protected areas and important nature areas in the vicinity of Kuzgun Dam HEPP site are evaluated; there is Tortum Basin KBA at a distance of approximately 9.8 km as the crow flies. There are no protected areas in the immediate vicinity of the project site (Figure 9).

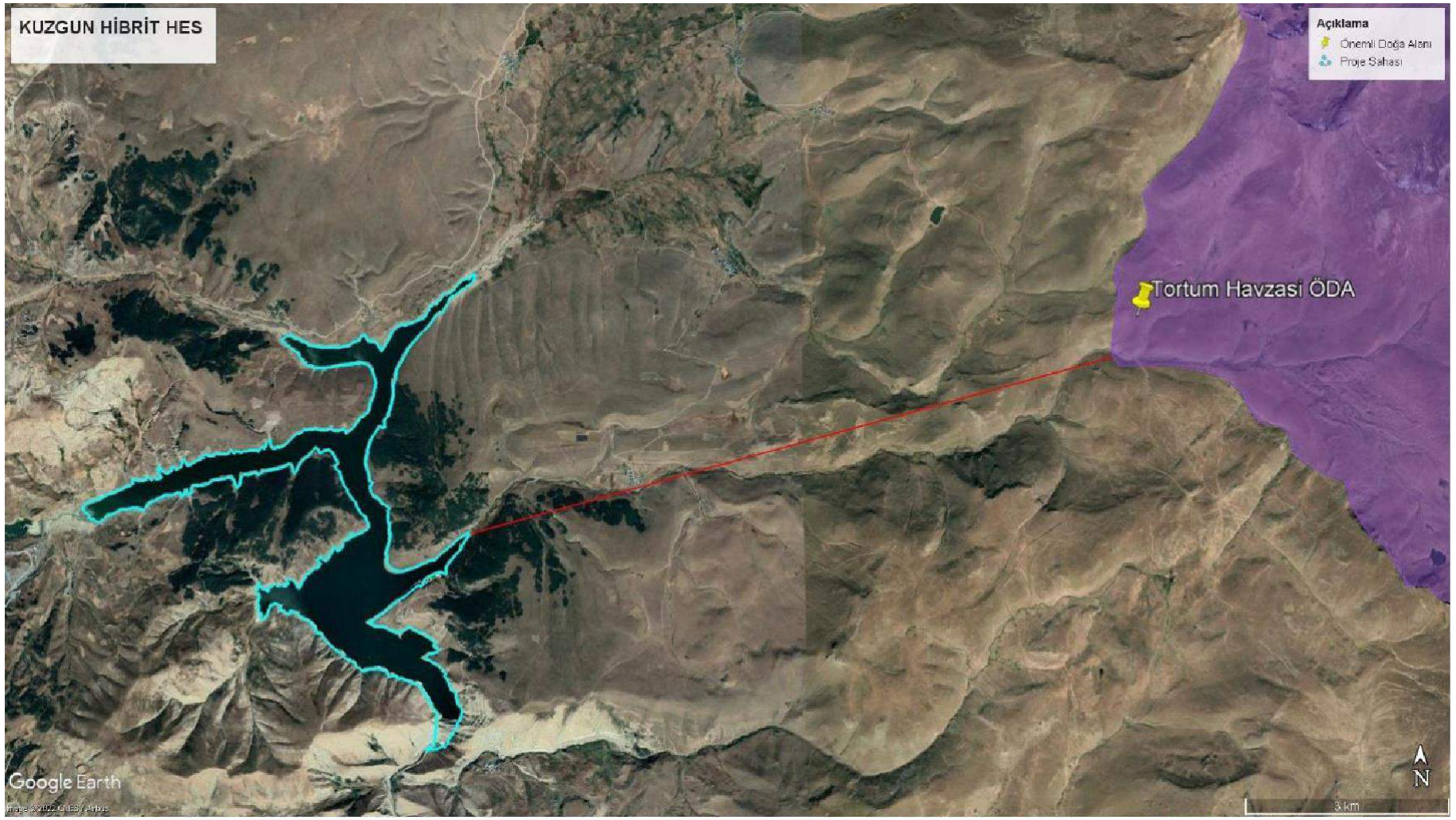


Figure 10 Satellite Image Showing the Relationship between the Project Area and Protected Areas

1.3 Identification and Classification of Habitats in the Impact Area of Kuzgun Dam and HEPP Facility

Operated by Zorlu Dođal Elektrik Üretimi A.Ş., Kuzgun Dam and HEPP is located on Serçeme Creek in Ispir district of Erzurum. The power plant, owned by Zorlu Enerji, is the 551st largest power plant in Turkey and the 551st largest power plant in Erzurum with an installed capacity of 20.90 MWe. It is also the 222nd largest hydroelectric power plant in Turkey.

There are 12 different habitat types in the Project area. 7 of these habitats are natural habitats and the remaining 5 are modified habitats, and the 1st, 2nd and 3rd level codes and vegetation types of the vegetation types developed in natural areas according to EUNIS Habitat Classification are given below (Figure 11).

Kuzgun HES EUNIS Habitat Haritası

Ölçek: 1:10,000



- ** Tesis binaları
- * C1.1 : Kalıcı oligotrofik göller, göletler ve rezervuarlar
- * C2.2 : Mevsimsel olmayan, hızlı akan akarsular
- * E2.64 : Çimlik alanlar, park çimlikleri
- * E4 : Subalpin ve alpin çayırlar
- * H3 : Sarp yamaçlar, ana kayanın yüzeye çıktığı taşlık alanlar
- * H5 : Bitki örtüsü seyrek açıklık alanlar
- * G1 : Yaprak döken ormanlar
- * G5 : Antropojenik ormanlar, baltalıklar, ağaç hatları
- ** J4.2 : Yol ağları
- ** J4.6 : Kaldırımlar, beton yüzeyler ve rekreasyon alanları
- ** J5.41 : İnsan yapımı tatlı su kanalları
- ** J6.5 : Endüstriyel atık depolama sahası

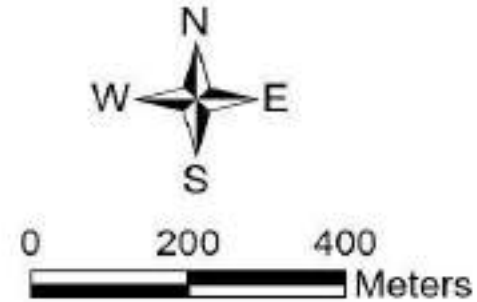


Figure 11 EUNIS Habitat Map of Kuzgun HEPP 1

Natural Habitats

C1.2 Permanent Mesotrophic Lakes, Ponds and Reservoirs

At an altitude of 2100 m, Kuzgun Pond was formed by human influence and its water mirror shows ups and downs due to the variability in the annual precipitation balance sheet. For this reason, a stable vegetation structure is not formed on the lakeside. However, there is a vegetation cover consisting of water loving plants and shaped according to the water mirror; *Polygonum amphibium*, *Sophora alopecuroides* var. *alopecuroides*, *Potentilla erecta*, *Epilobium parviflorum*, *Hippuris vulgaris*, *Inula helenium* subsp. *turcoracemosa*, *Arctium tomentosum* var. *glabrum*, *Primula auriculata*, *Calystegia sepium* subsp. *sepium*, *Veronica poljensis*, *Mentha aquatica*.



Photos 1 Permanent Mesotrophic Lakes, Ponds and Reservoirs (EUNIS:C1.2)

C2.2 Non-seasonal, fast flowing streams

At an altitude of 2030 m, the plant communities around the continuously flowing stream bed. These are *Cleome steveniana*, *Lathyrus pratensis*, *Trifolium spadiceum*, *Rubus caesius*, *Potentilla palustris*, *Agrimonia repens*, *Epilobium parviflorum*, *Epilobium minutiflorum*, *Saxifraga cymbalaria* var. *cymbalaria*, *Ribes orientale*, *Pimpinella peucedanifolia*, *Heracleum apiifolium*, *Cirsium arvense* subsp. *vestitum*, *Primula auriculata*, *Lysimachia vulgaris*, *Periploca graeca* var. *graeca*, *Swertia longifolia*, *Heliotropium circinatum*.



Photos 2 Non-seasonal, Fast Flowing Streams (EUNIS:C2.2)

G1 Deciduous Forests

The dominant plant taxa that make up the composition of these forests spread at altitudes of 2150 m are *Quercus macranthera*, *Cerasus prostrata* var. *prostrata*, *Sorbus roopiana*, *Sorbus kusnetzovii*, *Sorbus umbellata* var. *cretica*, *Pyrus syriaca* var. *syriaca*, *Lathyrus cicera*, *Trigonella fischeriana*, *Medicago rigidula* var. *rigidula*, *Crataegus pontica*, *Scandix iberica*.



Photos 3 Deciduous Forests (EUNIS:G1)

G5 Anthropogenic Forests, Coppice Forests

At 2000 m, it consists of coniferous and deciduous plant taxa. It was shaped by the anthropogenic impact of plant taxa present in the G1 habitat.

H5 Sparsely Vegetated Open Areas

At 2000 m altitude, the plants distributed in these habitats are *Grammosciadium pterocarpum*, *Evax anatolica*, *Galatella punctata*, *Senecio racemosus*, *Artemisia splendens*, *Serratula radiata* subsp. *biebersteiniana*, *Thymus leucotrichus* var. *leucotrichus*, *Crucianella exasperata*, *Asperula laxiflora*, *Allium dictyoprasum*.

H3 Steep Slopes, Stony Areas where the Bedrock Rises to the Surface

At an altitude of 2150 m, there are fragmented rocky and stony areas formed by surface runoff. The plant taxa distributed in these habitats are *Delphinium albiflorum*, *Ranunculus brachylobus* subsp. *brachylobus*, *Ranunculus dissectus* subsp. *glabrescens*, *Glaucium grandiflorum* var. *grandiflorum*, *Papaver pseudo-orientale*, *Lepidium perfoliatum*, *Aethionema cordatum*, *Alyssum stapfii*, *Alyssum longistylum*, *Hesperis bicuspidata*, *Murbeckiella huetii*, *Dianthus calocephalus*, *Saponaria prostrata* subsp. *calvertii*, *Silene italica*, *Silene ampullata*, *Atraphaxis billardieri* var. *tournefortii*, *Hypericum elongatum* subsp. *elongatum*, *Hypericum linarioides*, *Linum austriacum* subsp. *glaucescens*, *Oxytropis persica*, *Vicia sativa* subsp. *sativa*, *Medicago minima* var. *minima*, *Hedysarum hedysaroides*



Photos 4 Stony Areas where Bedrock Rises to the Soil Surface (EUNIS:H3)

E4 Subalpine and Alpine Meadows

At 2500 m altitude, the plant taxa identified in the alpine and sub-alpine layer are *Ranunculus brachylobus* subsp. *brachylobus*, *Ranunculus dissectus* subsp. *glabrescens*, *Alyssum murale* var. *alpinum*, *Astragalus onobrychis*, *Astragalus alyssoides*, *Vicia dadianorum*, *Trifolium canescens*, *Coronilla orientalis* var. *balansae*, *Potentilla argaea*, *Potentilla crantzii* var. *crantzii*, *Carum meifolium*, *Pastinaca armena* subsp. *armena*, *Valeriana alpestris*, *Gnaphalium sylvaticum*, *Senecio eriospermus* var. *eriospermus*, *Tripleurospermum caucasicum*, *Taraxacum crepidiforme* subsp. *crepidiforme*, *Campanula aucheri*, *Primula elatior* subsp. *pallasii*, *Gentiana aquatica*, *Nonea pulla* subsp. *scabrisquamata*, *Scrophularia chlorantha*, *Pedicularis caucasica*, *Pedicularis nordmanniana*, *Salvia staminea*, *Plantago atrata*, *Daphne glomerata*, *Asperula glomerata* subsp. *condensata* var. *condensata*, *Allium schoenoprasum*.



Photos 5 Subalpine and Alpine Meadows (EUNIS:E4)

Modified Habitats

Modified habitats in the Project area include grassy areas, park lawns (E2.64), road networks (J4.2), sidewalks, concrete surfaces, recreation areas (J4.6), man-made freshwater canals (J5.41), industrial landfill (J6.5) and facility buildings.



Photos 6 Switchyard

When the vegetation cover of the project area and its surroundings is examined, a large part of it consists of lakeside and riverside vegetation and alpine and subalpine mountain vegetation plants. In addition to deciduous and mixed forests, coppice deciduous forests due to human impact, steep slopes and stony areas and steppe character openings between them constitute the general vegetation structure of the area.

Aquatic Habitats

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

The classification of aquatic habitats in the area was based on the most recent version of the EUNIS Habitat Classification. This classification method allows for a broader analysis of habitats in relation to ecoregions, climate, soil and environmental pressures, as well as species, and is a way of comparing data with other countries. The system is currently organized into 10 main categories and their sub-categories according to a standardized terminology.

No special habitat types were found in the Kuzgun HEPP area during the surveys and studies. Semi-natural habitats stand out in the regulator and power plant areas. Other areas are natural habitats along the river. Fish, which feed on algae, zooplankton or benthic organisms living in the area, are at the top of the chain in the water. Fish habitats in the Kuzgun HEPP area are given in Table 1.

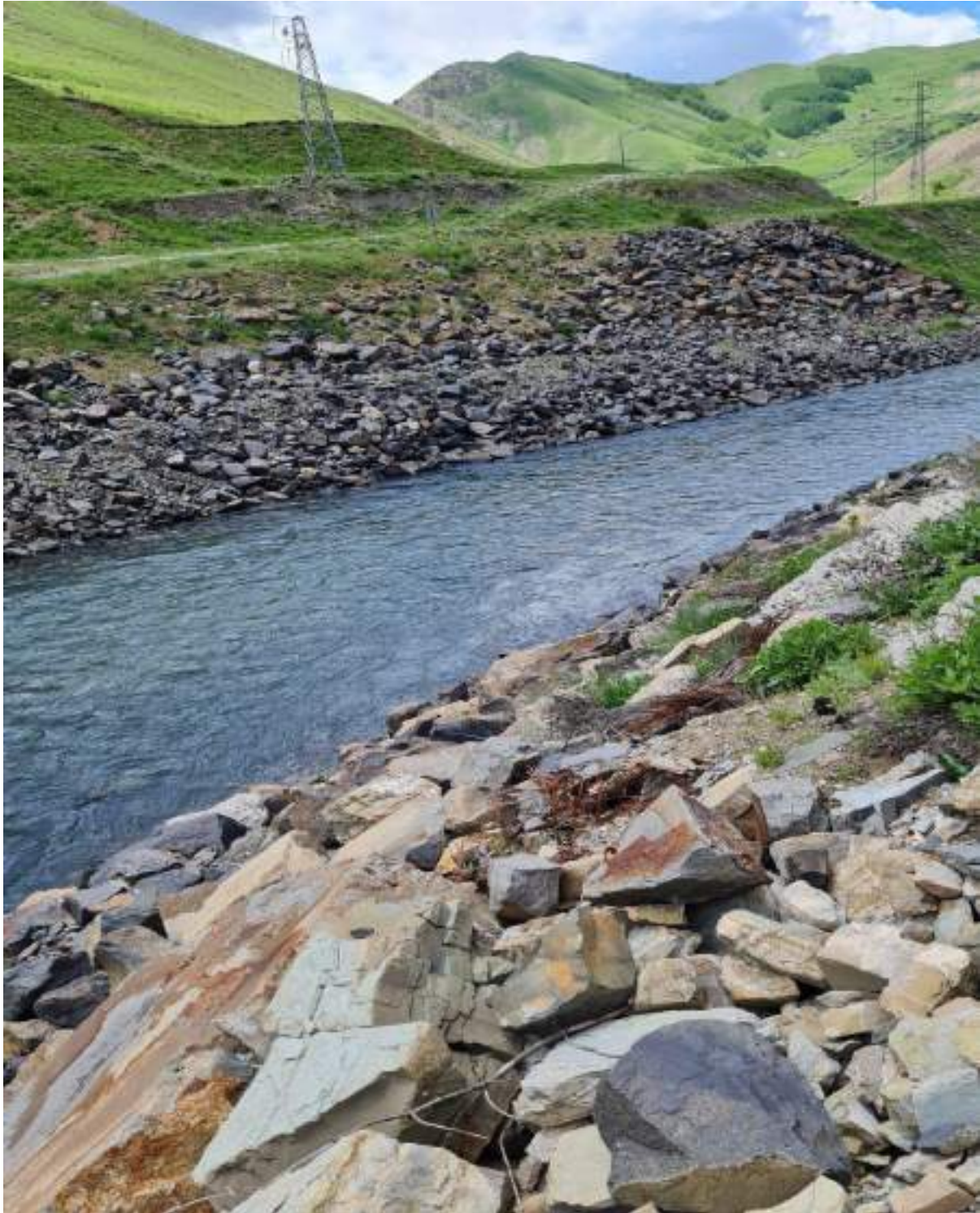
Table 1 Raven HEPP Aquatic Habitat and Characteristics

EUNIS CODE	HABITAT NAME	CHARACTERISTICS	DOMINANT SPECIES
C2	Surface Rivers	Other Perennial or Seasonal Streams in the Area are Representatives of this Habitat Type in the Area	Upper Trout Zone; <i>Salmo macrostigma</i> , Lower Trout Zone; Trout and Golyan (Pearl) fish (<i>Alburnoides bipunctatus</i>) Whiskered Fish Belt: Mustache fish (<i>Barbus lacerta</i>), plank fish (<i>Acanthobrama marmid</i>), and pufferfish (<i>Chondrostoma regium</i>), freshwater mullet (<i>Squalius cephalus</i>) species diversity is higher.

The stream bed generally looks like a natural habitat (Photograph 8). The degraded habitat structures in the vicinity of Kuzgun HEPP have adapted to the natural environment since there has been no external impact until today.



Photos 7 Semi-natural Habitat Structure around the Outflow Water in Kuzgun HEPP Area



Photos 8 Natural Aquatic Habitat Structure Near the Project Area

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

When the vegetation cover of the project area and its surroundings is examined, a large part of it consists of lakeside and riverside vegetation and alpine and subalpine mountain vegetation plants. In addition to deciduous and mixed forests, coppice deciduous forests due to human impact, steep slopes and stony areas and steppe character openings between them constitute the general vegetation structure of the area.

Considering the IFC PS-6 and Guidance Note 6 criteria, there are no plant taxa with CR and EN status under the IUCN convention and no critical habitats and plant taxa under the Bern and CITES conventions and their annexes.

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

1.5.1 Amphibian

Amphibian species found in the Project area and likely to be found are listed and critical species are given in the report. There are no endangered and/or endemic amphibian species in the Project area. The river environment after Kuzgun Dam and HEPP seems to be quite suitable for amphibians. *Rana macrocnemis* (Uludağ frog) was observed in abundance during the field study.

No negativity in terms of amphibians and measures to be taken have been observed in the project area. Sufficient water is released into the river bed after energy production.

Criterion 1: 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: Endemic and/or Narrowly Distributed Species. There are no endemic and/or narrowly distributed amphibian species in the Project area.

Criterion 3: Species that are migratory and/or concentrated in communities. There are no amphibian species in the Project area that meet this criterion.

Criterion 4: Highly Threatened and/or Uniquely Rare Ecosystems. Important habitat for amphibian species in the Project area is 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. In the current situation, it is not possible to say that the river habitat and its immediate surroundings are under a high level of threat.

Reptiles

There are no endemic reptile species in the Project area. According to IUCN lists, the only vulnerable reptile species is **the tortoise (*Testudo graeca*)** and it is listed in the VU category. The tortoise is also listed in the BERN Convention Appendix-II and CITES Appendix-II lists.

Among reptiles, the species likely to be directly affected by the project are *Mauremys caspica*, *Natrix tessellata* and *Natrix natrix*, which are partially or largely water-dependent reptile species. These species may be affected by water retention by the dam and a decrease in water in the river bed due to insufficient water being released into the river bed. However, since water is continuously released from the dam to the river bed for electricity generation, there is no negative impact on these species in the current situation.

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

Criterion 1: Critically Endangered (CR) and/or Endangered (EN) Species. **There are no** CR and/or EN category reptile species in the Project area.

Criterion 2: Endemic and/or Narrowly Distributed Species. **There are no** endemic or narrowly distributed reptile species in the Project area.

Criterion 3: Species that are migratory and/or concentrated in communities. **There are no** reptile species in the Project area that meet this criterion.

Criterion 4: Highly Threatened and/or Uniquely Rare Ecosystems. The important habitat type for reptile species in the Project area is the natural habitats in the region. The Project has been active in the area for many years. Natural habitats in the Project area have not been adversely affected by the Project. Since the Project has been in operation for many years, the negative impacts that occurred during the construction phase seem to have largely normalized. Currently, **there is no** negative impact on the reptile species that are distributed in the region.

Mammals

Lynx (*Lynx lynx*) is listed in the EN category according to the IUCN Mediterranean assessment. However, the project area is outside the IUCN Mediterranean assessment area, which generally covers the Aegean, Marmara and Mediterranean regions in Turkey. This species is not listed as endangered in the global assessment. Nevertheless, in this report, this species is considered to be a Critical species and has been assessed here. Although not endangered, an important mammal species for the project area is **the Otter (*Lutra lutra*)**. Plant staff confirmed the presence of Otter in the area. The species has an IUCN criterion of NT and a Bern Convention criterion of Annex II. In other words, it is a fauna species that needs to be strictly protected.

Criterion 1: 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: Endemic and/or Narrowly Distributed Species. **There are no** endemic and/or narrowly distributed mammal species in the Project area.

Criterion 3: Species that are migratory and/or concentrated in communities. **There are no** mammal species in the Project area that meet this criterion.

Criterion 4: Highly Threatened and/or Uniquely Rare Ecosystems. The important habitat type for mammal species in the Project area is the natural habitats in the region and the river bed. The Project has been active in the area for many years. Natural habitats in the area have not been adversely affected by the Project. Since the Project has been in operation for many years, the negative impacts that occurred during the construction phase seem to have largely normalized. Currently, **there is no** negative impact on mammal species in the region.

Criterion 5: Structural features of a region, such as topography, geology, soils, temperature, vegetation and combinations of these factors, can influence the evolutionary processes leading to the territorial patterning of species and ecological features. In some cases, distinctive spatial features have been associated with populations or subpopulations of plant and animal species that are genetically unique. Physical or spatial features have been identified as areal catalysts for evolutionary and ecological processes, and such features are often associated with species diversity. Species (or subpopulations of species) arising from the maintenance of the basic evolutionary processes inherent in an area have become a major focus of biodiversity conservation in recent years, particularly the conservation of genetic diversity. By maintaining species diversity in an area, the processes that drive speciation, as well as genetic diversity within species, provide evolutionary resilience in a system, which is especially important in a rapidly changing climate.

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

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 speciation process and high species and genetic diversity.

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

Connectivity between habitats (e.g. biological corridors) is particularly important in fragmented habitats and in the conservation of metapopulations, enabling species migration and gene flow. This connectivity also includes biological corridors along elevation and climate gradients and "crest to coast".

This includes areas of proven importance for climate change adaptation for both species and ecosystems.

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

Criterion 5 is assessed for Amphibians, Reptiles and Mammals together. Criterion 5 includes an assessment of whether the region in general contains important evolutionary processes. The area where Kuzgun 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 a large number of critical and/or endemic species. In this respect, the area **does not meet** Criterion 5.

Ornithology

As a result of the studies, a total of 47 bird species were identified in the project area and its immediate surroundings. The list of these species, their global Red List status, the status of the species in BERN, CITES and 2022 MAK decisions are given in Table 2 below.

The extinction of 1 of the species around the facility is threatened on a global scale. This species is the Lesser Vulture (*Neophron percnopterus*). The Little Vulture (*Neophron percnopterus*) has been identified as "EN" endangered according to IUCN criteria. Of the bird species found around the facility, 33 are listed in Annex-2 of the BERN Convention, 5 in Annex-3 of the BERN Convention, 1 in CITES Annex-1, 9 in CITES Annex-2 and 1 in CITES Annex-3.

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

Criterion 1: Habitats Important for Species Assessed as Critically Endangered (CR) or Endangered (EN)

The Lesser Vulture (*Neophron percnopterus*) is a globally endangered species with a Red List status of "EN". The species is expected to be seen in the project area during migration and in the spring and summer months corresponding to the breeding period (Kirwan et al., 2008). In order to make a sound assessment of this criterion, very detailed scientific studies are required in the region to make population size estimates (see Biodiversity Action Plan).

Criterion 2: Important Habitats for Endemic and Narrowly Distributed Species

Birds around the facility do not trigger this criterion.

Criterion 3: Habitats Hosting Globally Significant Numbers of Migratory and Gathering 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: Highly Threatened and/or Uniquely Rare Ecosystems

None of the habitats in the vicinity of the facility are listed as high or unique ecosystems on the IUCN Red List of Ecosystems and therefore this criterion is not triggered.

Criterion 5: Habitats identified with important evolutionary processes

The Kuzgun HEPP site is not significantly different from the surrounding area in terms of elevation, moisture gradients, or any other geological, ecological or evolutionary factor indicating that the area is vital for sustaining unique or distinctive evolutionary processes. Therefore, none of the habitats around the facility trigger Criterion 5.

Table 2 Bird Species Found and Likely to be Found in the Project Area

Species Scientific Name	Species English Name	Endemism	IUCN (Global)	BERN	MAKK	CITES
<i>Oenanthe oenanthe</i>	Northern Wheatear	Not Endemic	LC	Appx-2	Appx-1	KD
<i>Emberiza hortulana</i>	Ortolan Bunting	Not Endemic	LC	Appx-3	Appx-1	KD
<i>Lullula arborea</i>	Woodlark	Not Endemic	LC	Appx-3	Appx-1	KD
<i>Rhodopechys sanguineus</i>	Crimson-winged Finch	Not Endemic	LC	KD	Appx-1	KD
<i>Sturnus vulgaris</i>	Starling	Not Endemic	LC	KD	Appx-1	KD
<i>Columba livia</i>	Rock Pigeon	Not Endemic	LC	Appx-3	Appx-2	KD
<i>Coturnix coturnix</i>	Quail	Not Endemic	LC	Appx-3	Appx-2	KD
<i>Columba palumbus</i>	Wood Pigeon	Not Endemic	LC	KD	Appx-2	KD
<i>Corvus monedula</i>	Eurasian Jackdaw	Not Endemic	LC	KD	Appx-2	KD
<i>Pica pica</i>	Eurasian Magpie	Not Endemic	LC	KD	Appx-2	KD
<i>Tetraogallus caspius</i>	Caspian Snowcock	Not Endemic	LC	KD	KD	Appx-1
<i>Accipiter brevipes</i>	Levant Sparrowhawk	Not Endemic	LC	Appx-2	KD	Appx-2
<i>Aquila chrysaetos</i>	Golden Eagle	Not Endemic	LC	Appx-2	KD	Appx-2
<i>Buteo rufinus</i>	Long-legged Buzzard	Not Endemic	LC	Appx-2	KD	Appx-2
<i>Ciconia nigra</i>	Black Stork	Not Endemic	LC	Appx-2	KD	Appx-2
<i>Clanga pomarina</i>	Lesser Spotted Eagle	Not Endemic	LC	Appx-2	KD	Appx-2
<i>Hieraetus pennatus</i>	Booted Eagle	Not Endemic	LC	Appx-2	KD	Appx-2
<i>Milvus migrans</i>	Black Kite	Not Endemic	LC	Appx-2	KD	Appx-2
<i>Neophron percnopterus</i>	Egyptian Vulture	Not Endemic	EN	Appx-2	KD	Appx-2
<i>Gypaetus barbatus</i>	Bearded Vulture	Not Endemic	NT	KD	KD	Appx-2
<i>Carpodacus erythrinus</i>	Rosefinch	Not Endemic	LC	Appx-2	KD	Appx-3
<i>Actitis hypoleucos</i>	Sandpiper	Not Endemic	LC	Appx-2	KD	KD
<i>Aegypius monachus</i>	Cinereous Vulture	Not Endemic	LC	Appx-2	KD	KD

Species Scientific Name	Species English Name	Endemism	IUCN (Global)	BERN	MAKK	CITES
<i>Anthus spinoletta</i>	Water Pipit	Not Endemic	LC	Appx-2	KD	KD
<i>Carduelis carduelis</i>	Goldfinch	Not Endemic	LC	Appx-2	KD	KD
<i>Coracias garrulus</i>	European Roller	Not Endemic	LC	Appx-2	KD	KD
<i>Curruca curruca</i>	Lesser Whitethroat	Not Endemic	LC	Appx-2	KD	KD
<i>Cyanistes caeruleus</i>	Blue Tit	Not Endemic	LC	Appx-2	KD	KD
<i>Delichon urbicum</i>	House Martin	Not Endemic	LC	Appx-2	KD	KD
<i>Emberiza cia</i>	Rock Bunting	Not Endemic	LC	Appx-2	KD	KD
<i>Emberiza melanocephala</i>	Black-headed Bunting	Not Endemic	LC	Appx-2	KD	KD
<i>Lanius minor</i>	Lesser Grey Shrike	Not Endemic	LC	Appx-2	KD	KD
<i>Monticola saxatilis</i>	Rufous-Tailed Rock Thrush	Not Endemic	LC	Appx-2	KD	KD
<i>Motacilla alba</i>	White Wagtail	Not Endemic	LC	Appx-2	KD	KD
<i>Motacilla cinerea</i>	Grey Wagtail	Not Endemic	LC	Appx-2	KD	KD
<i>Oenanthe melanoleuca</i>	Black-eared Wheatear	Not Endemic	LC	Appx-2	KD	KD
<i>Oriolus oriolus</i>	Golden Oriole	Not Endemic	LC	Appx-2	KD	KD
<i>Petronia petronia</i>	Rock Sparrow	Not Endemic	LC	Appx-2	KD	KD
<i>Phoenicurus ochruros</i>	Black Redstart	Not Endemic	LC	Appx-2	KD	KD
<i>Ptyonoprogne rupestris</i>	Eurasian Crag Martin	Not Endemic	LC	Appx-2	KD	KD
<i>Pyrrhocorax pyrrhocorax</i>	Red-billed Chough	Not Endemic	LC	Appx-2	KD	KD
<i>Saxicola rubetra</i>	Whinchat	Not Endemic	LC	Appx-2	KD	KD
<i>Tadorna ferruginea</i>	Ruddy Shelduck	Not Endemic	LC	Appx-2	KD	KD
<i>Upupa epops</i>	Hoopoe	Not Endemic	LC	Appx-2	KD	KD
<i>Cuculus canorus</i>	Cuckoo	Not Endemic	LC	Appx-3	KD	KD
<i>Alaudala heinei</i>	Greater Short-toed Lark	Not Endemic	LC	KD	KD	KD
<i>Phylloscopus nitidus</i>	Green Warbler	Not Endemic	LC	KD	KD	KD

The wetlands in the project area have ecologically different characteristics. Bacillariophyceae class was the most dominant class in almost all of the sampled stations. Especially in terms of species diversity, they constitute the most populous class of freshwater. Members of this class have a very important place both qualitatively and quantitatively both in Turkey and in the world freshwaters. Although they show seasonal variations in terms of population densities, they can be dominant organisms under favorable conditions. The most important algal group of Kuzgun dam area aquatic systems were the members of Bacillariophyta. 96 taxa belonging to this class were identified. While members of this class were the most dominant organism in terms of number of species, they were abundant in many months in terms of population densities, especially among attached algae, compared to other classes. Among these species, Naviculaceae stood out as the family with the highest number of genera.

Members of Chlorophyceae constitute the second group after Bacillariophyceae in terms of species diversity. A total of 28 taxa belonging to this class were identified. When the Chlorophyta divisions were evaluated within themselves, they showed significant increases in the summer months, especially during the sampling period at the still water stations.

Spirogyra spp., Oocystis, Scenedesmus taxa from Chlorophyceae were dominant. These taxa were the most important organisms that provided the increase of Chlorophyta in summer compared to other months. Hutchinson (1967) reported that green algae increase in summer and Scenedesmus, which also shows a significant increase in these months, are common organisms of eutrophic lakes. Abundance assessments have shown that this species has a significant density in polluted areas. Chlorococcales members are common in polluted areas, but Oocystis genus is reported to prefer clean water. (Hutchinson, 1967; Reynolds, 1984).

Desmidiaceae members are also abundant in oligotrophic lakes (Hutchinson, 1967). In addition, Desmidiaceae members were reported to be more abundant in lakes with pH lower than 7. Cosmarium and Closterium genera, which are prominent in this group, were found in moderate abundance in many stations.

Twenty-six taxa belonging to the class Cyanophyceae were identified and the most dominant groups were the genera *Nostoc*, *Anabaena* and *Oscillatoria*. It is known that blue-green algae blooms in wetlands with high productivity during the summer months when the temperature increases. These include the genera *Microcystis* and *Anabaena*. Both genera have shown the expected increase, especially in stagnant water environments. However, the species *Nostoc commune* has been the dominant species of the epilithic habitat during hot periods but in clear and fast flowing water systems. This species was only sampled from the clear water tributary.

Five taxa belonging to the class Euglenophyceae were identified. *Euglena* and *Phacus* genera show an increase in the number of individuals in the first months of summer. This increase in summer can be explained by the fact that the members of Euglenophyceae have the potential to grow in environments with high temperature and pollution (Round, 1973).

Species belonging to the class Pyrrophyceae are the group represented with the lowest percentage in total phytoplanktonic organisms. Two taxa belonging to this class were identified. Among these taxa, *Peridinium* genus is common in eutrophic lakes according to Hutchinson (1967) and Reynolds (1984). In general, the algae species identified in the study area are cosmopolitan species similar to those found in many lakes of Turkey.

The main factors affecting zooplankton distribution in freshwater systems can be classified as nutrients, competition, mechanical relationships with other organisms, predation and parasitism, as well as physical and chemical properties of water. Temperature-dependent changes in environmental factors affect the distribution of zooplanktonic organisms (Wetzel, 1983, Herzig, 1984). Another important factor affecting zooplankton community structure is predation. Many invertebrates and fishes feed on Rotifera at least for a certain period of their lives (Herzig, 1980). In addition, current is a disadvantage in the distribution of zooplanktonic organisms.

As a result of the identification of invertebrates, a total of 65 taxa were found from three stations. In general, it is noteworthy that Diptera (20 taxa) and Ephemeroptera (11 taxa) members of the Insecta class were dominant in terms of number of species and population densities in all environments. However, Odonata, Coleoptera and Hemiptera were also found in high taxon numbers. Chironomidae of the order Diptera and Heptageniidae of the order

Ephemeroptera were found in high densities in terms of number of species. Chironomidae from the Diptera family was dominant in the sludge analysis of Serçeme Stream and Kuzgun Dam, especially in their stagnant environments. Some species in this family are considered as indicators of eutrophic waters living in polluted waters.

Chironomidae larvae constitute the dominant benthic group in Kuzgun Dam. However, Gammaridae family members, Plecoptera nymphs, Ephemeroptera nymphs and Simuliidae larvae are the dominant benthos members.

One of the most important factors affecting the diversity and distribution of bottom invertebrates in rivers is undoubtedly the chemical and physical properties of the water. These properties are also used as criteria for quality classification of surface waters.

A total of 13 fish taxa were captured and identified as a result of fish sampling in and around the project area. Of these, 11 belong to Cyprinidae, 1 to Salmonidae and 1 to Balitoridae families.

Among the identified specimens, *Barbus plebejus* and its subspecies are listed in Annex III of the international Bern Convention and are among the species that need to be protected. According to the European Red List, 4 species are not evaluated (NE) and all other species are in the low risk (LC) category. No CITES-listed species were observed in the project area.

Table 3 Algae Species of the Project Area and Environment

BACILLORIOPHYCEA
<i>Achnanthes flexella</i> var. <i>flexella</i>
<i>Achnanthes hungarica</i>
<i>Achnanthes lanceolata</i>
<i>Achnanthes minutissima</i>
<i>Amphora coffeiformis</i>
<i>Amphora commutata</i>
<i>Amphora normanii</i>
<i>Amphora ovalis</i>
<i>Amphora veneta</i>
<i>Anomoeoneis sphaerophora</i>
<i>Aulacoseira ambigua</i>
<i>Aulacoseira granulata</i>
<i>Bacillaria paradoxa</i>
<i>Caloneis alpestris</i>
<i>Caloneis bacillum</i>
<i>Caloneis permagna</i>
<i>Caloneis schumanniana</i>
<i>Cocconeis pediculus</i>
<i>Cocconeis placentula</i>
<i>Cyclotella comta</i>
<i>Cyclotella kützingiana</i>
<i>Cyclotella meneghiniana</i>
<i>Cyclotella ocellata</i>
<i>Cymatopleura elliptica</i>
<i>Cymatopleura solea</i>
<i>Cymbella affinis</i>
<i>Cymbella caespitosa</i>
<i>Cymbella cistula</i>
<i>Cymbella cymbiformis</i>
<i>Cymbella helvetica</i>
<i>Cymbella lanceolata</i>
<i>Cymbella prostrata</i>
<i>Denticula elegans</i>
<i>Denticula kuetzingii</i>
<i>Diatoma hiemala</i>
<i>Diatoma tenuis</i>
<i>Diatoma vulgaris</i>
<i>Diploneis ovalis</i>
<i>Epithemia argus</i>
<i>Epithemia sorex</i>
<i>Fragilaria capucina</i>
<i>Fragilaria contruens</i>
<i>Fragilaria crotonensis</i>
<i>Fragilaria dilatata</i>
<i>Fragilaria parasitica</i>
<i>Fragilaria pulchella</i>
<i>Fragilaria ulna</i>
<i>Gomphonema acuminatum</i>
<i>Gomphonema angustum</i>

<i>Gomphonema gracile</i>
<i>Gomphonema olivaceum</i>
<i>Gomphonema parvalum</i>
<i>Gomphonema pseudoaugur</i>
<i>Gomphonema truncatum</i>
<i>Gyrosigma acuminatum</i>
<i>Gyrosigma attenuatum</i>
<i>Hantzschia amphioxys</i>
<i>Melosira varians</i>
<i>Meridion circulare</i>
<i>Navicula capitatoradiata</i>
<i>Navicula cincta</i>
<i>Navicula cryptocephala</i>
<i>Navicula cuspidata</i>
<i>Navicula gracilis</i>
<i>Navicula nivalis</i>
<i>Navicula oblonga</i>
<i>Navicula pupula</i>
<i>Navicula pygmaea</i>
<i>Navicula radiosa</i>
<i>Navicula rhyncocephala</i>
<i>Navicula tuscula</i>
<i>Navucila bacillum</i>
<i>Neidium affine</i>
<i>Neidium dubium</i>
<i>Nitzschia amphibia</i>
<i>Nitzschia constricta</i>
<i>Nitzschia dissipata</i>
<i>Nitzschia gracilis</i>
<i>Nitzschia hantschiana</i>
<i>Nitzschia hungarica</i>
<i>Nitzschia linearis</i>
<i>Nitzschia obtusa</i>
<i>Nitzschia palea</i>
<i>Nitzschia sigmoidea</i>
<i>Nitzschia tryblionella</i>
<i>Pinnularia borealis</i>
<i>Pinnularia microstauron</i>
<i>Rhoicosphenia abbreviata</i>
<i>Rhopalodia constricta</i>
<i>Rhopalodia gibba</i>
<i>Stauroneis smithii</i>
<i>Stephanodiscus astrea</i>
<i>Surirella angusta</i>
<i>Surirella brebissonii</i>
<i>brightwelli</i>
<i>Surirella ovalis</i>
CYANOPHYCEA
<i>Anabaena komvophoron</i>
<i>Anabaena spiroides</i>
<i>Calothrix epiphytica</i>
<i>Calothrix fusca</i>

<i>Chroococcus minutus</i>
<i>Chroococcus turgidus</i>
<i>Gloeotrichia echinulata</i>
<i>Lynbya aestuarii</i>
<i>Lynbya hieronymusii</i>
<i>Merismopedia elegans</i>
<i>Merismopedia glauca</i>
<i>Merismopedia punctata</i>
<i>Microcystis aeruginosa</i>
<i>Nostoc commune</i>
<i>Oscillatoria agardhii</i>
<i>Oscillatoria brevis</i>
<i>Oscillatoria formosa</i>
<i>Oscillatoria limnetica</i>
<i>Oscillatoria limosa</i>
<i>Oscillatoria rubescens</i>
<i>Oscillatoria tenuis</i>
<i>Schizothrix natans</i>
<i>Spirulina laxissima</i>
<i>Spirulina major</i>
<i>Spirulina sp.1</i>
<i>Spirulina sp.2</i>
CHLOROPHYCEA
<i>Ankistrodesmus falcatus</i>
<i>Cladophora fracta</i>
<i>Cladophora glomerata</i>
<i>Closterium diana</i>
<i>Closterium lunula</i>
<i>Coelastrum microporum</i>
<i>Cosmarium botrytis</i>
<i>Cosmarium granatum</i>
<i>Gloeocystis sp.</i>
<i>Gonium pectorale</i>
<i>Mougeotia sp.</i>
<i>Oedogonium sociale</i>
<i>Oocystis borgei</i>
<i>Oocystis crassa</i>
<i>Pediastrum boryanum</i>
<i>Pediastrum dublex</i>
<i>Pediastrum simplex</i>
<i>Scenedesmus acuminatus</i>
<i>Scenedesmus ecornis</i>
<i>Spirogyra circumlineata</i>
<i>Spirogyra dubia</i>
<i>Spirogyra sp. 1</i>
<i>Spirogyra sp. 2</i>
<i>Spirogyra sp. 3</i>
<i>Staurodesmus sp.</i>
<i>Tetraedron minimum</i>
<i>Ulothrix subconstricta</i>
<i>Zygnema sp.</i>

EUGLENOPHYCEA
<i>Euglena acus</i>
<i>Euglena oxirus</i>
<i>Phacus curvicauda</i>
<i>Phacus orbicularis</i>
<i>“Trachelomonas sp.</i>
PYRROPHYCEAE
<i>Glenodinium sp.</i>
<i>Peridinium sp.</i>

Table 4 Zooplanktonic Species of the Project Area and Surroundings

ROTIFERA	Lindia sp.
<i>Brachionus patulus</i>	<i>Polyarthra remata</i>
<i>Colurella colurus</i>	<i>Proales theodora</i>
<i>Colurella uncinata</i>	<i>Proales fallaciosa</i>
<i>Colurella adriatica</i>	<i>Philodina megalotrocha</i>
<i>Colurella obtusa</i>	<i>Bedelloid rotifer</i>
<i>Cephalodella gibba</i>	CLADOCERA
<i>Cephalodella catellina</i>	<i>Moina sp.</i>
<i>Cephalodella tenuior</i>	<i>Alona rectangula</i>
<i>Cephalodella sp</i>	<i>Daphnia sp.</i>
<i>Dissotrocha sp.</i>	COPEPODA
<i>Euchlanis sp.</i>	<i>Cyclops sp.</i>
<i>Keratella tecta</i>	
<i>Lepadella patella</i>	
<i>Lepadella quadricarinata</i>	

Table 5 Benthic Organisms of the Project Area and Surroundings

Phylum: ANNELIDA
Class: CLITELLATA
Order: HIRUDINEA
Family: Erpobdellidae
<i>Erpobdella sp.</i>
Class: OLIGOCHAETA
Order: LUMBRICULIDAE
<i>Lumbriculus variegatus (Müller, 1774)</i>
Order: TUBIFICIDA
Family: Tubificidae
<i>Tubifex tubifex (Müller, 1774)</i>
<i>Limnodrilus udekemianus Claparède, 1862</i>
<i>Potamotheix hammoniensis (Michaelsen, 1901)</i>
Family: Naididae
<i>Nais communis Piquet, 1906</i>
<i>Nais variabilis Piquet, 1906</i>
<i>Nais elinguis Müller, 1773</i>
<i>Pristinella jenkiniae (Stephenson, 1931)</i>
Phylum: ARTHROPODA
Class: CRUSTACEA
Order: AMPHIPODA

Family: Gammaridae
Gammarus pulex
Order: DECAPODA
Family: Oniscidae
Potamon sp.
Class: INSECTA
Order: HEMIPTERA
Family: Corixidae (Nimf)
Micronecta sp.
Family:Hydrometridae
Hydrometra sp.
Family:Corixidae
Corixa sp.
Family:Gerridae
Geris sp.
Family:Notonectidae
Notonecta sp.
Order: COLEOPTERA
Family: Hydrophilidae
Hydrobius fuscipes (Linnaeus, 1758)
Laccobius bipunctatus (Fabricius, 1775)
Family: Noteridae
Noterus (Noterus) clavicornis (De Geer, 1774)
Family: Dytiscidae
Hydroporus marginatus (Duftschmid, 1805)
Laccophilus minutus (Linnaeus, 1758)
Order: EPHEMEROPTERA
Family: Baetidae
Baetis muticus (Linnaeus, 1758)
Baetis vernus (Curtis, 1834)
Cloeon dipterum (Linnaeus, 1761)
Family: Oligoneuriidae
Oligoneuriella zanga
Family: Heptageniidae
Rhithrogena caucasica
Iron caucasicus
Heptegenia longicauda (Stephens, 1835)
Family: Ephemerellidae
Ephemera vulgata Linnaeus, 1758
Ephemerella ignita (Poda, 1761)
Family: Potamanthidae
Potamianthus luteus (Linnaeus, 1767)
Family: Caenidae
Caenis macrura
Order: PLECOPTERA
Family: Taeniopterygidae
Taeniopteryx sp.
Family: Perlodidae
Isoperla obscura
Perlodes sp.
Family: Perlidae
Perla marginata

Order: TRICHOPTERA
Family: Hydroptilidae
<i>Hydroptila</i> sp.
Family: Limnophilidae
<i>Limnophilus</i> sp.
Family: Hydropsychidae
<i>Hydropsyche</i> sp.
Family: Leptoceridae
<i>Leptocerus</i> sp.
Order: ODONATA
Family: Aeshnidae
<i>Anax imperator</i>
<i>Aeshna</i> sp.
Family: Cordulegasteridae
<i>Cordulegaster boltonii</i>
Family: Calopterygidae
<i>Calopteryx splendens</i>
Family: Coenagrionidae
<i>Coenagrion</i> sp.
Order: DIPTERA
Blephariceridae
<i>Liponeura cinerascens</i>
Family: Limoniidae
<i>Dicranota bimaculata</i>
Family: Simuliidae
<i>Simulium morsitans</i>
<i>Simulium bezzi</i>
<i>Simulium angustipes</i>
<i>Prosimulium</i> sp.
Family: Empididae
<i>Pterempis</i> sp.
Family: Chironomidae
<i>Procladius (Holotanypus)</i> sp.
<i>Krenopelopia binotata</i> (Wiedemann, 1817)
<i>Brillia modesta</i> (Meigen, 1830)
<i>Cardiocladius capucinus</i> (Zetterstedt, 1850)
<i>Abiskomyia paravirgo</i> Goetghebuer, 1940
<i>Nanocladius rectinervis</i> (Kieffer, 1911)
<i>Halocladius fucicola</i> (Edwards, 1926)
<i>Corynoneura</i> sp.
<i>Thienemanniella</i> sp.
<i>Pentapedilum exsectum</i> (Kieffer, 1916)
<i>Polypedilum pedestre</i> (Meigen, 1830)
<i>Paralauterborniella nigrohalteralis</i> (Malloch, 1915).
<i>Paratanytarsus lauterborni</i> (Kieffer., 1909)

Biodiversity Risk Assessment

Flora

Considering the criteria of IFC PS-6 and Guidance Note 6, there are no plant taxa with CR and EN status under the IUCN convention and no critical habitats or plant taxa under the Bern and CITES conventions in and around the Project area.

During the visit to the facility, it was observed that there is a surface movement of material both at the points where the dam body touches the sloping slopes and in the areas reaching the water mirror from the reservoir sides. Terracing and afforestation to prevent this material mobility in front of and behind the body will both prevent the filling of the dam basin and provide stability on vegetation.

Invasive Species

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

Alien invasive species (IAS) can have 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 change ecosystems, for example by altering soil composition or creating habitats that encourage forest fires. These effects can lead to the local or global extinction of native species and ultimately to ecological devastation.

IAS can also have significant socio-economic impacts. The European Union (EU) has recognized the human health impacts of IAS,

EUR 12 billion worth of losses per year due to the impact on infrastructure damage and agricultural losses.

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

In 2013, the European Commission (EC) put forward a legislative proposal within the framework of an EU Regulation on IAS, putting forward the issues of prevention of their introduction, early warning/rapid response and effective and coordinated management. IUCN has been providing technical and scientific support to the implementation of the EU IAS Regulation since 2016, through a series of service contracts with the EC and in collaboration with the IUCN Invasive Species Specialist Group (ITUG).

Invasive flora species have been identified in the Project impact area (Table 7). Compliance with the Biodiversity Action Plan is required.

Energy investment sites are areas shaped by human impact. In these areas, construction activities arising from the nature of the investment were tried to be rehabilitated with 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 works, species transported by floods and overflows or faunistic resources may have the same characteristics. For these reasons, in order to protect the existence of natural areas within the energy investment area, the individuals and diaspores (breeding units) of these plants should be cleared from the area.

Timing: Control of invasive plant species should be done before the plant goes to seed. If the plant is recognized by its above-ground parts before flowering, it is removed in spring, if not, it is removed immediately after flowering.

Table 7: Invasive Species Found and Likely to be Found in the Project Area

<i>Acer negundo</i> (Ash Maple) Areas Open To Andropogenic Effects	
<i>Agropyron repens</i> (Couch Grass) Field, Open Area	
<i>Ailanthus altissima</i> (The tree of heaven) Areas Open To Andropogenic Effects	
<i>Amaranthus retroflexus</i> (Pigweed) Field, Open Area	

<i>Boreava orientalis</i> (Waxy Leaved Mustard) Field, Roadside	
<i>Chenopodium album</i> (Goosefoot) Flood, Floodplains	
<i>Cirsium arvense</i> (Creeping Thistle) Flood, Floodplains	
<i>Conyza canadensis</i> (Canadian Horseweed) Areas Open To Andropogenic Effects	

Conyza bonariensis (Hairy Fleabane) Areas Open To
Andropogenic Effects



Conyza albida (White Fleabane) Areas Open To
Andropogenic Effects



Cuscuta campestris (Golden Dodder) Meadow-Pasture
Habitats



<i>Lepidium draba</i> (Hoary Cress) Areas Open To Andropogenic Effects	
<i>Nasturtium officinale</i> (Watercress) Riverside	
<i>Reseda lutea</i> (Wild Mignonette) Field, Roadside	
<i>Rumex acetosella</i> (Sheep's Sorrel) Field, Roadside and Wastelands	

<i>Senecio vernalis</i> (Eastern Groundsel) Roadside and Areas Shaped By Human Influences	
<i>Sicyos angulatus</i> (Star-Cucumber) Humid Areas	
<i>Solanum americanum</i> (American Black Nightshade) Waterside and Moist Shady Areas	
<i>Portulaca oleracea</i> (Purslane) Field, Open Area	
<i>Phytolacca americana</i> (Pokeweed) Stream Beds And Moist Habitats	

Paspalum distichum (Knotgrass) In Canals Within Water Communities



Robinia pseudoacacia (Black Locust) Roadsides



Xanthium strumarium (Cocklebur) Flood, Floodplains



Xanthium spinosum (Spiny Cocklebur) Flood, Floodplains



<i>Viscum album (European Mistletoe) Parasite on Trees</i>	

Fauna

Considering the IFC PS-6 and Guidance Note 6 criteria, "critical species" assessment and "critical habitat" assessment have been made in section 5 and there are no Critical species in terms of fauna (Amphibians, Reptiles, Mammals) in the region and accordingly no critical habitat.

Risk Assessment for Tortoise (*Testudo graeca*): This species was observed in the vicinity of the site. Its presence in the area was assessed as rare. Since it is not a water-dependent species, it was assessed that the facility does not have a negative impact on this species. However, it would be useful to increase awareness about the species and take some measures to prevent damage to the species, especially in human-mosquito 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 to be very suitable for this species. It is difficult to be seen by humans as it prefers to stay away from humans and is very well camouflaged. It seems unlikely that the animal will be negatively affected by a HEPP facility due to its lifestyle. However, it would be useful to raise awareness about the species and take some measures 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 was confirmed by project staff. There is plenty of water left in the river bed after energy production. No direct threat to the species was observed.

Ornithology

Considering the criteria of IFC PS-6 and Guidance Note 6, "critical species" assessment and "critical habitat" assessment were made in section 5 and there is a Critical species in the region in terms of birds. This species is the Lesser Vulture (*Neophron percnopterus*). The actions given in the Biodiversity Action Plan for this species should be considered.

Several other soaring bird species have also been identified in the vicinity of the facility and are at risk of collision with the transmission lines. Some of these species are Red Hawk (*Buteo rufinus*), Bearded Vulture (*Gypaetus barbatus*) and the endangered Lesser Vulture (*Neophron percnopterus*). Other than that, it was assessed that the facility does not pose a serious risk to birds. It was also determined that there are many songbird species in and around the facility site. The very good amount of water released from the facility is a positive situation for species such as *Cinclus cinclus* (*Cinclus cinclus*) that live in downstream habitats and depend on these river habitats. During the field studies, it was observed that there are many species of cavity-nesting birds and that they nest everywhere, including in holes in light poles. Other than this, the facility has no direct negative impact on bird diversity and populations.

Hydrobiology

There are no intensive fishing activities in the region. Domestic and industrial pollution sources of the settlements in the upper basin of Kuzgun significantly threaten the presence and density of fish species. These species are widespread and abundant in the inland waters of Anatolia.

Rivers are complex and dynamic ecosystems. By altering these areas, lotic species will be significantly affected and decline due to the loss of their breeding grounds with the change of environment. Riverine species normally inhabit and spawn in shallow places and seek such habitats after the formation of a reservoir. When they cannot find them, they face losing competition with other lentic species due to the difference in their ecological niche. In applications such as HEPPs, areas where some species can live after the formation of such areas should also be protected.

Aquatic species form characteristic biocenoses by adapting to the living conditions in a particular river section and shaped by the change of abiotic factors along the river (Vannote et al. 1980). Algae, zooplankton and benthic organisms living in the fluvial

environment can also form new communities within this biocenosis, creating significant changes, especially in the food pyramid. More productive stagnant water environments may constitute important food areas for all aquatic organisms.

No invasive algae, zooplankton, benthic organisms or fish species were found in Kuzgun HEPP and surrounding areas. Social responsibility projects and biodiversity action plans are important at this point.

Environmental Risk Analysis

The possibility that a project may directly or indirectly adversely affect human health or the environment is called Environmental Risk. Estimating the magnitude of risk in all activities and deciding whether the risk can be tolerated is called **Risk Assessment**.

Environmental Risk Assessment is a set of studies using appropriate qualitative and / or quantitative methods to identify environmental hazards that exist in the working environment with systematic methods, to reveal risks and to control risks.

To determine the possible environmental impacts that may occur in the periods determined within the scope of the environmental management and monitoring plan and to minimize the impacts of the project by comparing the compliance of the studies carried out by collecting the relevant data in this context with the legislation;

- management of the business,
- waste
- air emissions,
- noise,
- waste water

such effects will be monitored.

It is necessary to prepare a Waste Management Plan 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 legislation in force during all stages of the Project. Waste Management to be implemented within the scope of the Project is given in Table 8.

Table 8: Waste Management to be Implemented

PHASE	SUBJECT		PRECAUTION
CONSTRUCTION AND OPERATION PHASE	Noise and Vibration		Noise generation during the operation phase of the project will be caused by vehicles. However, all necessary safety precautions should be taken by the owner of the activity in order to prevent any negative impact of the activity and any complaints or suggestions from the nearby settlements should be taken into consideration and the owner of the activity should do as required.
	Air Emissions	Because of Vehicle	The vehicles used in the project area must comply with the provisions of the "Regulation on Exhaust Gas Emission Control and Gasoline and Diesel Oil Quality Regulation", which entered into force after being published in the Official Gazette dated 11.03.2017 and numbered 30004.
	Waste Management	Domestic Solid Waste	Domestic solid wastes generated within the scope of the project must be collected in closed containers against odor, pests and negative effects.
		Packaging Waste	For the management of domestic solid wastes, the provisions of the "Waste Management Regulation" published in the Official Gazette dated 02.04.2015 and numbered 29314 must be complied with. Household solid wastes of organic origin that cannot be recycled should be collected in sealed household waste bins and delivered to the relevant Municipality. Recyclable wastes (glass, paper/cardboard, metal, etc.) should be collected separately from other wastes, collected in containers and recycled by companies licensed by the Ministry of Environment, Urbanization and Climate Change. The provisions of the Regulation on the Control of Packaging Wastes, which entered into force after being published in the Official Gazette dated 26.06.2021 and numbered 31523, must be complied with. The containers in which the wastes are accumulated must be kept closed at all times to prevent gnawing animals and pests.
		Domestic Waste Water	Within the scope of the wastewater generated during the operation phase, the provisions of the "Water Pollution Control Regulation", which entered into force after being published in the Official Gazette dated 31.12.2004 and numbered 25687, must be complied with. During operation, the provisions of the Regulation on Water Pollution Control and the Regulation on the Protection of Drinking-Utilization Water Basins must be complied with. In all stages of the project, the provisions of the "Law No. 167 on Groundwater" published in the Official Gazette dated 23.12.1960 and numbered 10688 and the "Regulation on the Protection of Groundwater against Pollution and Degradation" published in the Official Gazette dated 07.04.2012 and numbered 28257 must be complied with.

PHASE	SUBJECT		PRECAUTION
		Waste Batteries and Accumulators	Within the scope of waste batteries and accumulators generated within the scope of the process, in accordance with Article 13- of the Regulation on the Control of Waste Batteries and Accumulators; waste batteries should be collected separately from household waste, waste batteries should be delivered to the collection points to be established by the enterprises that distribute and sell battery products or by municipalities, and the batteries, batteries and / or accumulators used in transformers should not be kept for more than ninety days on a sealed ground in the field until they are delivered to the manufacturer after they become waste. In accordance with the provisions of the "Regulation on the Control of Waste Batteries and Accumulators" published in the Official Gazette dated 31.02004 and numbered 25569, the waste must be disposed of.
		Medical Wastes	For medical waste generated within the scope of the activity; Establishing a system to minimize waste at the source Preparing and complying with the in-unit industrial waste management plan, including separate collection, transportation and temporary storage of wastes and measures to be taken in the event of an accident Collecting medical, hazardous and domestic wastes and packaging wastes separately at the source without mixing with each other, Use the bags and containers whose technical specifications are specified in the Regulation when collecting medical waste and sharp-piercing waste, Transport separately collected medical and domestic waste separately only by vehicles allocated for this purpose In order to temporarily store wastes, temporary waste storage will be built or containers must be available, and the provisions of the Legislation must be complied with.
		Waste Electronic Equipment	Electronic waste generated within the scope of the process is likely to occur. The electronic wastes generated must be collected in the temporary waste storage area and given to the licensed disposal/recovery company. The provisions of the Regulation on the Control of Waste Electrical and Electronic Equipment, which entered into force after being published in the Official Gazette dated 22.05.2012 and numbered 28300, must be complied with.
		Waste Oils	Within the scope of waste oils generated at all stages of the project, the provisions of the "Regulation on Waste Oil Management" published in the Official Gazette dated 21.12.2019 and numbered 30985 and the "Waste Management Regulation" published in the Official Gazette dated 02.04.2015 and numbered 29314 must be complied with.

PHASE	SUBJECT		PRECAUTION
			The waste oils generated should be stored in the Temporary Waste Storage Area and recovered and/or disposed of by companies licensed by the Ministry of Environment, Urbanization and Climate Change.
		Waste Plantal Oils	In case the project generates vegetable waste oil, it is necessary to comply with the relevant provisions of the "Regulation on the Control of Vegetable Waste Oils" published in the Official Gazette dated 06.06.2015 and numbered 29378.
		End-of-Life Tires	In the event that such wastes are generated for any reason, the provisions of the "Regulation on the Control of End-of-Life Tires" dated 25.11.2006 and numbered 26357) must be complied with.
		Hazardous Wastes	In case fluorescent lamps used in lighting, printing toners from printers used in the administrative building, contaminated wastes and other hazardous wastes are generated at any stage of the process, they must be stored in the Temporary Waste Storage Area in accordance with the waste codes and recovered and/or disposed of by companies licensed by the Ministry of Environment, Urbanization and Climate Change.
		Oily Sludge	Oily sludge resulting from any stage of the process or from equipment maintenance work should be sent to licensed companies for disposal.

The relevant applications have been completed within the scope of the Regulation on the Amendment of the Zero Waste Regulation and the facility has a zero waste certificate. The facility has an Industrial Waste Management Plan prepared within the scope of the Waste Management Regulation and 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 wastes generated at the facility are sorted on-site in accordance with their codes and stored regularly in the Temporary Waste Storage Area. The stored wastes are recycled through licensed companies.

It has been determined that waste scrap materials are stored on the soil floor in some areas of the facility, and attention should be paid to the storage of scrap materials on concrete floors.

Domestic wastewater generated within the scope of the project is collected in the cesspool and it has been determined that it is disposed of by taking septic tank service.

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

1.1 Biodiversity Action Plan

Kuzgun Dam and HEPP Biodiversity Action Plan							
Action Code	Habitat Class	Action Subject	Action Region	Action Reason	Action/Implementation Details	Action Period	Action Duration
K1	All Habitats	Critical Protection of Fauna Species	General Area	Research on Endangered Fauna Species, especially the Small Vulture (Neophron Percnopterus) Species should be investigated in and around the Project Area.	Species/Population Level Monitoring by Expert Biologists	During Operation	Months Between March-November for 2 Years
K2	Operation	Protection of Fauna Species	General Area	Placing Nest Boxes Designed by Experts in and Around the Facility Site and Monitoring the Nests.	Species/Population Level Monitoring by Expert Biologists	During Operation	Months Between March-November for 2 Years
K3	Operation	Protection of Fauna Species	Project Area and Surroundings	Training should be provided to facility employees about the Tortoise (Testudo Graeca) species. Caution Signs should be placed at certain points in the Project Area.	Training should be provided by biologists who are experts in the field	During Operation	1 Time in Months April-May 2024
K4	All Habitats	Protection of Fauna Species	Project Area and Surroundings	Sesamuru (Lutra lutra) Species should be researched in and around the Project Area and Training should be provided.	Training should be provided by biologists who are experts in the field	During Operation	1 Time in September 2024
K5	Operation	Protection of Fauna Species	Project Area and Surroundings	Training should be provided to facility employees about the Lynx (Lynx Lynx) species.	Training should be provided by biologists who are experts in the field	During Operation	April-May 2024

Kuzgun Dam and HEPP Biodiversity Action Plan							
Action Code	Habitat Class	Action Subject	Action Region	Action Reason	Action/Implementation Details	Action Period	Action Duration
K6	Operation	Protection of Fauna Species	Project Area and Surroundings	Tesiste Asla Evcil Kedi Bulundurulmamalıdır. Evcil Köpek Bulundurulmaması Önerilmekle Birlikte Bulundurulsa Bile Özellikle Gece Serbest Dolaşmalarına İzin Verilmemelidir	By Company	During Operation	Year 2024 April-May
K7	Operation	Protection of Fauna Species	Project Area and Surroundings	Bölgede Ayı (<i>Ursus Arctos</i>) Bulunmaktadır. İnsan-Ayı Karşılaşmaları Bazen Tehlikeli Olabilmektedir. Ayıları Bölgeye Çekmemek İçin Tesiste Açıkta Asla Besin İçeren Çöpler Bırakılmamalıdır. Bir Çöp Yönetim Planı Hazırlanmalı Ve Ayıları Çekebilecek Tarzdaki Çöpleri Nasıl Depolandığı Ve Uzaklaştırıldığı Hakkındaki Uygulama Raporlanmalıdır.	By Company	During Operation	Sürekli
K8	Operation	Protection of Fauna Species	Project Area and Surroundings	Tosbağalar Ve Diğer Hayvanlar Yolları Geçerken Araçlar Tarafından Ezilmemesi Amacıyla Tesis İçinde Araç Hızlarının 30 Km/Saat İle Sınırlandırılması, Geçiş Önceliğinin Her Zaman Hayvanlara Verilmesi Gereklemektedir.	By Company	During Operation	Sürekli
K9	Tüm	İstilacı Türlerin	Proje Alanı	Proje Alanı Ve Çevresinde	Konunun Uzmanı	İşletme	1 Yıl Süreyle

Kuzgun Dam and HEPP Biodiversity Action Plan							
Action Code	Habitat Class	Action Subject	Action Region	Action Reason	Action/Implementation Details	Action Period	Action Duration
	Habitats	Inhibition	and Surroundings	The Invasive Species Found and Especially Ailanthus Altissima Should Be Investigated and Monitored in the Project Area and Its Surroundings and a Dismantling Plan Should Be Prepared.	Species/Population Level Monitoring by Biologists	During Operation	July-August
K10	Operation	Protection of Fauna and Flora Species	Barrage Body	Terracing Should Be Done In Sloping Areas.	By the Company in Coordination with Biologists Who are Experts in the Subject	During Operation	Once in a Year Before Rainy Season
K11	Operation	Protection of Fish Species	Project Area	Some of the fish species can migrate long distances and some short distances. It is important to build a fish passage in order to prevent the contraction of the gene diversity of fish.	By the Company in Coordination with Biologists Who are Experts in the Subject	During Operation	2023 May-August
K12	Operation	Prevention of Environmental Pollution	Project Area	Hazardous wastes generated within the enterprise must be delivered to recycling/disposal facilities by licensed companies in accordance with Waste Codes.	By Company	During Operation	Once in 6 months

Kuzgun Dam and HEPP Biodiversity Action Plan							
Action Code	Habitat Class	Action Subject	Action Region	Action Reason	Action/Implementation Details	Action Period	Action Duration
K13	Operation	Prevention of Environmental Pollution	Project Area	Non-hazardous waste generated within the business must be delivered to recycling/disposal facilities by licensed companies in accordance with the waste codes.	By Company	During Operation	Once in a year
K14	Operation	Prevention of Environmental Pollution	Project Area	Vacuuming Domestic Waste water with a Vacuum Truck	By Company	During Operation	When the Septic Tank Reaches 80% Level
K15	Operation	Legislation Compliance	Project Area	Environmental Permit Exemption Must Be Obtained.	By Company	During Operation	2022 December

PROJECT TEAM

Name-Surname/Title	Department of the Report/Study	Sign
<i>Senior Biologist Tarık BATUHAN</i>	Project and Report Coordination	
<i>Prof Dr. Mustafa SÖZEN</i>	Ecological Assessment Fauna	
<i>Prof. Dr. Tahir ATIICI</i>	Assessment Hydrobiological	
<i>Asst. Prof. Kerim GÜNEY</i>	Assessment Flora and Vegetation Assessment	
<i>Kaan ÖZGENCİL</i>	Ornithological Assessment and GIS	
<i>Biologist Mehmet Ali YÜKSEL</i>	Studies Ecological Studies and Field Coordination	
<i>Expert Bird Watcher Ayhan BATUHAN</i>	Bird Watching	

ATAKÖY REGULATOR AND HEPP FACILITY BIODIVERSITY ACTION PLAN

1.1 Entrance

The Ataköy Regulator and Hydroelectric Power Plant (HPP) Facility is located in the Black Sea Region, within the borders of Tokat Province, in the Merkez and Almus districts, on the Yeşilırmak River. The Ataköy Regulator and HPP Facility is situated 2.6 km northwest of the Almus Dam.

Tokat Province, where the project is located, lies in the central part of the Black Sea Region. It is bordered by Samsun to the north, Sivas to the northeast, Yozgat to the southwest, and Amasya to the west.

Access to the project site is possible via roads on the right and left banks of the Yeşilırmak River, branching off from the Tokat-Niksar road. The site is 399 km from Ankara, 232 km from Samsun, 233 km from Ordu, 108 km from Sivas, 206 km from Yozgat, 114 km from Amasya, and 785 km from Istanbul by road.

Additionally, the village of Kadıvakfı is located approximately 1 km from the project site in a straight line. The villages of Derekışla, Çökelikkışla, and Üçgöl are approximately 2.5 km, 2 km, and 1.5 km away from the project site, respectively. Moreover, the important centers of Niksar, Tokat, and Erbaa are approximately 15 km, 23 km, and 33 km away, respectively, from the site in a straight line (Figures 3-4).

There are no significant wetlands in the vicinity of the site, except for the Almus Dam (Figure 5).



Figure 1 Satellite Image of the Project Site

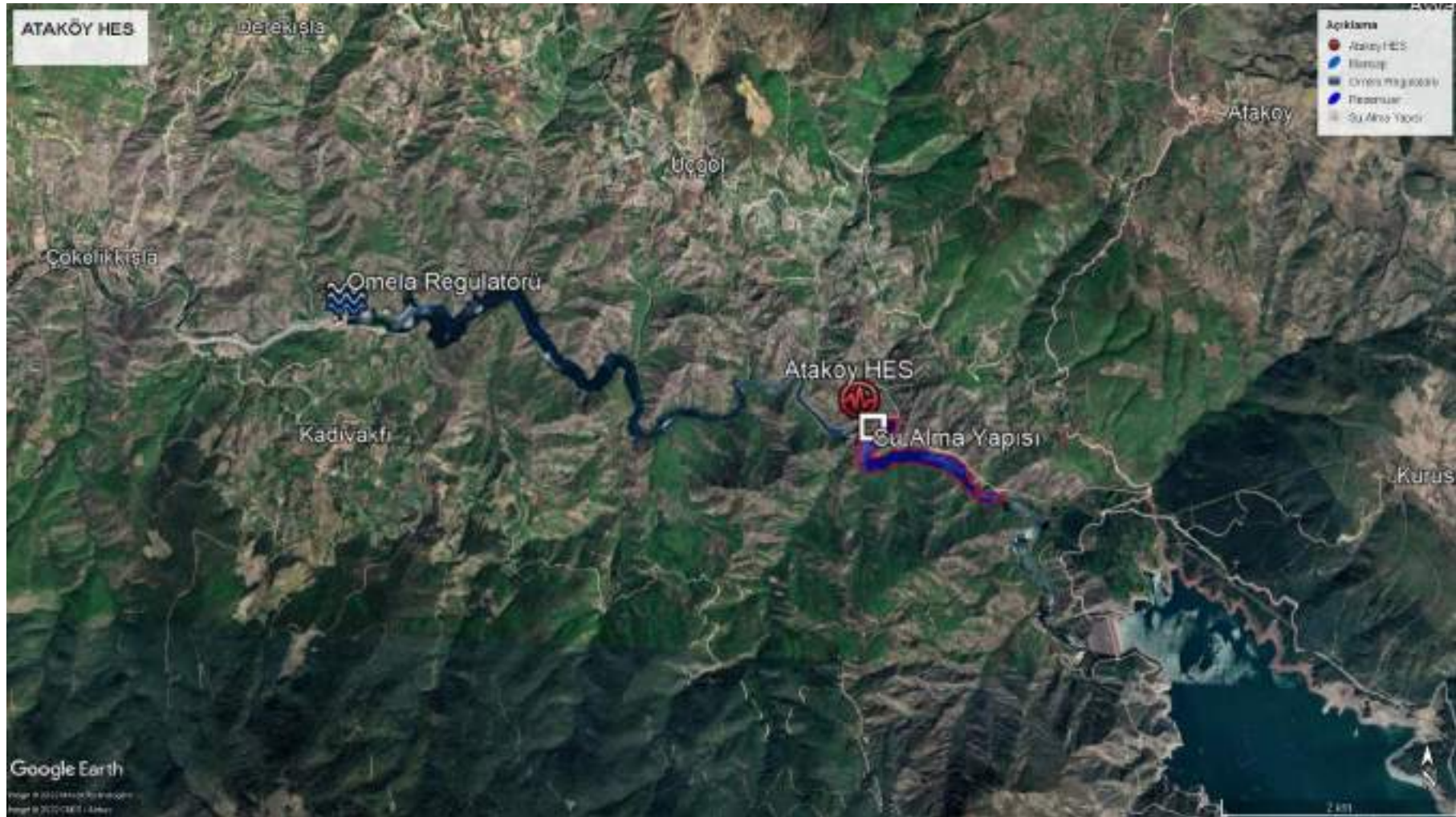


Figure 2 Satellite Image of the Project Site - 2

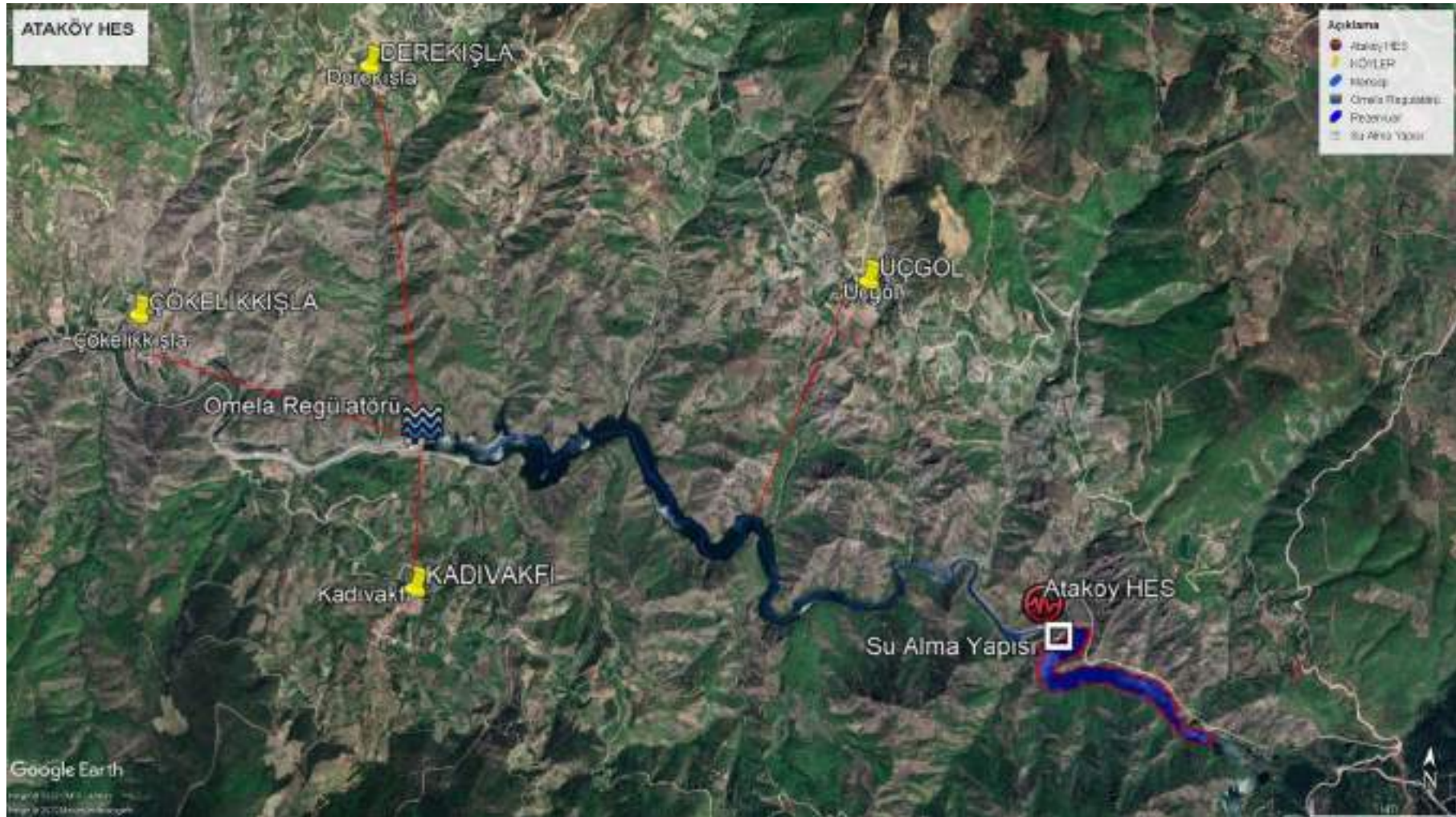


Figure 3 Nearby Villages (Neighborhoods) Around the Project Site

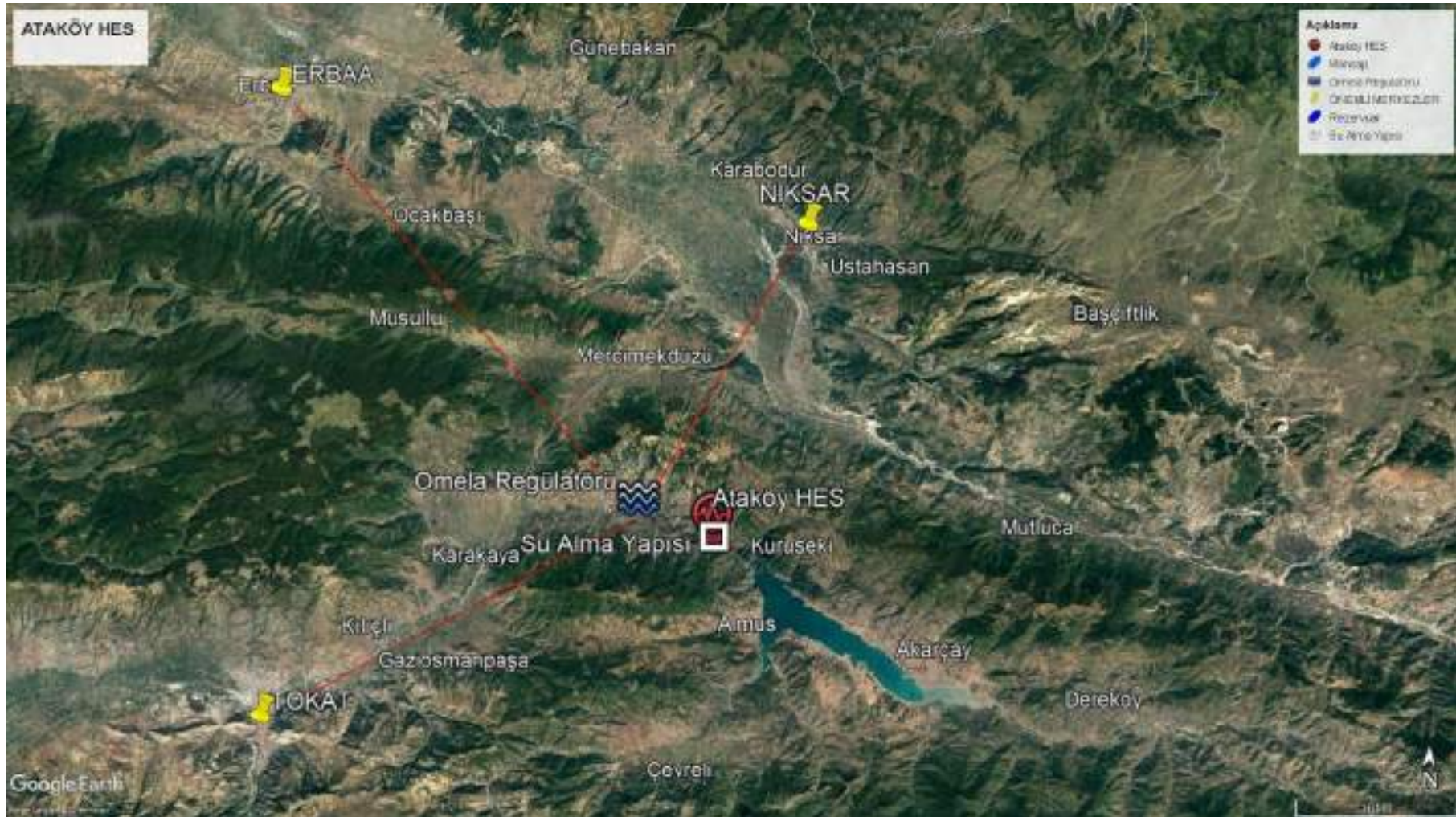


Figure 4 Settlements Near the Project Site



Figure 5 Important Wetlands Around the Project

1.2 Relationship of the Area with Protected and Special Status Areas

When evaluating the location of the Ataköy HPP site in relation to nearby protected areas and important natural sites, it is found that Kelkit Valley is approximately 6 km away in a straight line. Additionally, Zivan Nature Park is located about 32 km away, Ballica Cave Nature Park is approximately 48 km away, and Tokat Kaz Lake is around 58 km from the project site in a straight line. Furthermore, the project site is within the boundaries of the Kelkit Valley Important Natural Area (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 Ataköy Regulator and HPP Facility

The Ataköy Regulator and HPP Facility, operated by Zorlu Doğal Elektrik Üretimi A.Ş., is located on the Yeşilırmak River within the borders of Tokat Province, in the Merkez and Almus districts of the Black Sea Region. The project site is situated approximately 2.6 km northwest of the Almus Dam.

There are 11 different habitat types within the project area. Of these habitats, 7 are natural, while the remaining 5 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, as detailed below (Figure 8).

Ataköy HES EUNIS Habitat Haritası

Ölçek: 1:7,000



- ** Tesis binaları
- * C1.2: Kalıcı mezotrofik göller, göletler ve rezervuarlar
- * C2.2: Mevsimsel olmayan hızlı akan akarsular
- * G1: Yaprak döken ormanlar
- * G4: Karışık ormanlar
- * G5: Antropojenik ormanlar, baltalıklar, ağaç sıraları
- * H3: Sarp yamaçlar, ana kayanın yüzeye çıktığı taşlık alanlar
- * H5: Bitki örtüsü seyrek açık alanlar
- ** J2.3: Kırsaldaki aktif kullanılan endüstriyel yapılar
- ** J4.2: Yol ağları
- ** J4.6: Kaldırımlar, beton yüzeyler, rekreasyon alanları
- ** J5.41: İnsan yapımı tatlı su kanalları



0 125 250
Meters

Figure 8 Ataköy HPP EUNIS Habitat Map 1

➤ Natural habitats

C1.2 Permanent mesotrophic lakes, ponds And Reservoirs

Plant taxa distributed in the area where the water reservoir habitat with a water mirror is located at an altitude of 740 m; *epilobium parviflorum* , *Sideritis taurica* , *Euphorbia microsphaera* , *Carex hordeistichos* , *Ranunculus constantinopolitanus* , *Glycyrrhiza echinata* , *Lathyrus aphacavaryete biflorus* , *Cephalaria aristata* , *Cirsium canum* , *Lathyrus aphaca* var. *biflorus* , *Cephalaria aristata* , *Teucrium scordium* subsp . *scordioides* .



Photos one Permanent mesotrophic lakes, ponds And reservoirs (EUNIS: C1.2)

C2.2 seasonal Non Fast Flowing streams

Plant taxa distributed in the existing habitat at an altitude of 730 m downstream of the facility; *trifolium hybridum* var. *anatolicum* , *Filipendula ulmaria* , *Epilobium parviflorum* , *Onopordum carduchorum* , *Scrophularia umbrosa* , *Teucrium scordium* subsp . *scordioides* , *Mentha longifolia* subsp . *longifolia* , *Mentha spicata* subsp . *spicata* , *Galium rivale* .



Photos 2 seasonal Non Fast Flowing streams (EUNIS: J2.2)

G1 Leaf Deciduous Forests

In this habitat, which spreads around the facility at altitudes of 750 and above; *Acer tataricum* , *Acer campestre subsp . leiocarpum* , *Sorbus torminalis var. torminalis* , *Verbascum pyramidatum* , *Juglans regia* , *fagus orientalis* , *Quercus petraea subsp . iberica* , *Quercus infectoria subsp . infectoria* , *Quercus coccifera* , *Carpinus orientalis* , *Ostrya carpinifolia* , *Corylus* There is *avellana . avellana* , *Alnus glutinosa subsp . glutinosa* , *Alopecurus myosuroides var. myosuroides* herb taxa detection has been made.

G4 Mixed Forests

Plant taxa detected in this habitat, observed at an altitude of 740 m; *Pinus sylvestris* , *Alyssum sibiricum* , *Silene italica* , *Cicer pinnatifidum* , *Dorycnium pentaphyllum* subsp . *anatolicum* , *Tanacetum poteriifolium* , *Phillyrea latifolia* , *Lithospermum purpureocaeruleum* , *Anchusa* It has a *barrelier . barrelieri* , *Quercus petraea* subsp . *iberica* , *Quercus coccifera* , *Sorbus torminalis* var. *torminalis* , *Plantago major* subsp . *intermedia* , *Euphorbia rigida* , *Carpinus orientalis* .



Photos 3 Mixed Forests (EUNIS: G4)

G5 anthropogenic Forests, coppice Forests

It consists of a mixture of plant taxa that start from 800 m near the facility and spread in G1 and G4 habitats. G5 habitat emerges when the closure of woody taxa distributed in these habitats is broken.

H3 Steep slopes, bedrock to the surface dating Gizzard Fields

Plant taxa that spread in habitats consisting of steep rocks at altitudes of 850 and above; *ephedra major* , *Conringia perfoliata* , *Aethionema armenum* , *Clypeola jonthlaspi* , *Erysimum smyrnaeum* , *Sobolewsia clavata* , *Minuartia montanra* subsp . *wiesneri* , *Hypericum organifolium* , *Pistacia terebinthus* subsp . *palaestina* , *Psoralea acaulis* , *Vicia peregrina* , *Lathyrus saxatilis* , *Anthyllis vulneraria* subsp . *boisseri* , *Cerasus Believe me. incana* , *Falcaria vulgaris* , *Malabaila secacul* , *Morina persica* var. *persica* , *Solidago virgaurea* subsp . *virgaurea* , *Echinops viscous* subsp . *viscosus* , *Convolvulus lineatus* .



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

H5 Herb Cover Rare Clearance Areas

In the facility, in steppe character habitats consisting of bush clearings at an altitude of 860 m; *malwa sylvestris* , *Papaver rhoeas* , *Astragalus microcephalus* , *Cichorium intybus* , *Euclidium syriacum* , *Alyssum dasycarpum* var. *dasycarpum* , *Silene italica* , *Silene chlorifolia* , *Silene spergulifolia* , *Hypericum organifolium* , *Echinophora tenuifolia* subsp . *sibthorpiana* , *Senecio pseudo-orientalis* , *Onopordum turcicum* , *Onopordum carduchorum* , *Lamium purpureum* var. *purpureum* , *Sideritis montana* subsp . *montana* , *Euphorbia aleppica* , *Galium verticillatum* , *Callipeltis cucullaria* plant taxa were identified.



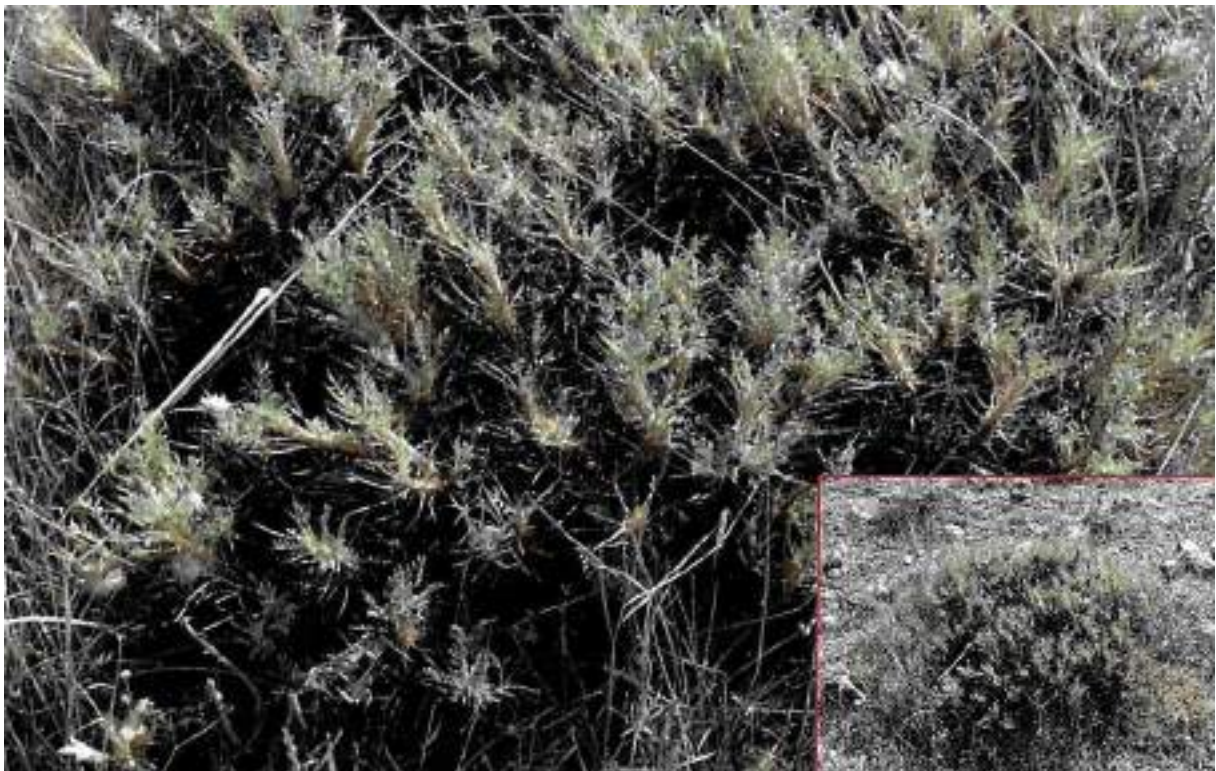
Photos 5 *malva sylvestris*



Photos 6 *Cichorium intybus*



Photos 7 *Papaver rhoeas*



Photos 8 *astragalus microcephalus*



Photos 9 *Quercus cerris*

➤ **Modified Habitats**

Areas with habitat codes J4.2, J5.42, J6.1 are concrete, chemical water and asphalt and do not have floral content. However, the seeds germinating in the cracks occurring in these structures cleaning of the system integrity for It is important. J4.6 And I.1.3 coded in habitat Care should be taken to ensure that the plants used for landscaping and food purposes are not invasive species.



Photos 10 in the countryside Active Used Industrial Buildings (EUNIS: J2.3)



Photos 11th Person making Sweet This channels (EUNIS: J5.41)

When we look at the vegetation of the project site and its surroundings; A large part of it consists of forest areas. These areas are leafy, mixed or have been exposed to human influence and turned into coppice form. Plant with steppe character in forest clearings While taxa are present, rocky plant communities stand out in places where the slope rises rapidly or the bedrock emerges. Since the water surface of the pond varies, there are water-loving plant communities even though there is no stable vegetation structure around it. Streamside plant communities are observed in the upstream and downstream of the pond .

➤ **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 Ataköy HEPP area in the examinations and studies carried out. 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. Observation made Atakoy HEPP in the field fish habitats In Table 1 has been given.

Table 1: Atakoy HEPP aquatic habitat And Features

EUNIS CODE	HABITAT NAME	FEATURES	RAID SPECIES
C2	surface streams	in the field Other Continuous 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 the hornbill (<i>Chondrostoma regium</i>), fresh water mullet (<i>Squalius cephalus</i>) type diversity more is too much.

The stream bed generally looks like a natural habitat (Photo 13). The deteriorated habitat structures around Ataköy HEPP have adapted to the natural environment since there has been no external influence to date.



Photos 12 Atakoy HEPP in the field Exit juice around Semi-Natural habitat Structure



Photos 13 Atakoy HEPP Natural habitat Structure

1.2 Atakoy regulator And HEPP facility Effect in the field floristic biodiversity

Definition

When we look at the vegetation of the project site and its surroundings; A large part of it consists of forest areas. These areas are leafy, mixed or have been exposed to human influence and turned into coppice form. Plant with steppe character in forest clearings While taxa are present, rocky plant communities stand out in places where the slope rises rapidly or the bedrock emerges. Since the water surface of the pond varies, there are water-loving plant communities even though there is no stable vegetation structure around it. Streamside plant communities are observed in the upstream and downstream of the pond .

Guidance in terms of floristics at the Ataköy Regulator and HEPP facility site Considering the Note 6 criteria, since there are no plant taxa with CR and EN status, critical species and habitat assessments were not made within the scope of IFC.

1.3 Atakoy regulator And HEPP facility Effect in the field faunistic Defining Biodiversity

1.3.1 Amphibian

There is no endangered amphibian species in the project area. However, its distribution in the area Anatolian **Rough Salamander (*Triturus*) *anatolicus*)** is an endemic species and has a wide distribution from the Anatolian part of the Marmara Region to the Trabzon Region. Amphibian species found in the area are common species.

negative effects or precautions to be taken are foreseen for amphibians 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. **Anatolian Rough Salamander (*Triturus*) ,** which is endemic to the project site ***anatolicus*)** is distributed. The distribution area of this endemic species is more than 50,000 square kilometers (km²). is too much. It is not possible to say that the project site is an area that regularly hosts $\geq 10\%$ of the global population size of this species and ≥ 10 of the reproductive units of a species. In this regard, according to available information, the project site **does not meet the threshold value for Criterion 2.**

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.

1.3.2 Reptiles

There are no endemic reptile species in the project area. According to IUCN lists, the only reptile species that is sensitive **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.

Apart from this, there is no endangered or endemic reptile species in the project area .

are Natrrix , which are partially or largely water-dependent reptile species. *tessellata* and *Natrrix natrrix* . The impact of these species may be due to the decrease in water in the stream bed due to not enough water being released into the stream bed. However, since the amount of lifewater released into the stream bed is at a very good level, no negative impact on these species has been observed in the current situation.

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

Criterion 1: Refers to Critically Endangered (CR) and /or Endangered (EN) Species. 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** .

1.3.3 Mammals

(*Lynx*) is **one** of the species likely to be distributed in the region. *lynx*) is listed in the EN category according to the IUCN Mediterranean assessment. 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 not endangered, an important mammal species for the project area is **the Otter (*Lutra lutra*)** . 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 areas 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 connection also extends across elevation and climate gradients and across crest-to- coast to coast)” also includes biological corridors.

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 Ataköy 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 a large number of critical and/or endemic species. In this regard, the area **does not meet** Criterion 5 .

1.3.4 Ornithology

As a result of the studies, a total of 28 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 2 below.

It has been observed that none of the species found around the facility are endangered on a global scale. 9 of the species found around the facility are included in BERN Agreement Annex-2 and 13 of them are included in BERN Agreement Annex-3.

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

Habitats Important to Critically Endangered (CR) or Endangered (EN) Species

No bird species rated as “CR” or “EN” were detected around the facility. Therefore, depending on the birds around the Ataköy HEPP site, **Criterion 1 is not triggered.**

Criterion 2: endemic And Narrow widespread Species For Important Habitats

Facility around found **these are** the birds **criterion It does not trigger.**

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

The Ataköy HEPP facility does 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 2 Project in the field Found And Finding Likely Bird Types

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>Ardea alba</i>	Great Egret	Not endemic	LC	Annex 2	KD	KD
<i>Ardea cinerea</i>	Grey Heron	Not endemic	LC	Annex 3	Annex 1	KD
<i>Aythya fuligula</i>	Tufted Duck	Not endemic	LC	Annex 3	Annex 2	KD
<i>Bucephala clangula</i>	Common Goldeneye	Not endemic	LC	Annex 3	KD	KD
<i>Carduelis carduelis</i>	European Goldfinch	Not endemic	LC	Annex 2	KD	KD
<i>Certhia familiaris</i>	Eurasian Treecreeper	Not endemic	LC	Annex 2	KD	KD
<i>Chroicocephalus ridibundus</i>	Black-headed Gull	Not endemic	LC	Annex 3	Annex 1	KD
<i>Corvus corax</i>	Common Raven	Not endemic	LC	Annex 3	Annex 1	KD
<i>Corvus cornix</i>	Hooded Crow	Not endemic	LC	KD	Annex 2	KD
<i>Egretta garzetta</i>	Little Egret	Not endemic	LC	Annex 2	KD	KD
<i>Fringilla coelebs</i>	Chaffinch	Not endemic	LC	Annex 3	Annex 1	KD
<i>Fulica atra</i>	Common Coot	Not endemic	LC	Annex 3	Annex 2	KD
<i>Garrulus glandarius</i>	Eurasian Jay	Not endemic	LC	KD	Annex 2	KD
<i>Ichthyaetus ichthyaetus</i>	Pallas's Gull	Not endemic	LC	KD	Annex 1	KD
<i>Lanius excubitor</i>	Great Grey Shrike	Not endemic	LC	KD	KD	KD
<i>Linaria cannabina</i>	Common Linnet	Not endemic	LC	Annex 2	KD	KD
<i>Motacilla alba</i>	White Wagtail	Not endemic	LC	Annex 2	KD	KD
<i>Passer montanus</i>	Eurasian Tree Sparrow	Not endemic	LC	Annex 3	Annex 1	KD
<i>Phalacrocorax carbo</i>	Great Cormorant	Not endemic	LC	Annex 3	Annex 1	KD
<i>Pica pica</i>	Eurasian Magpie	Not endemic	LC	KD	Annex 2	KD
<i>Podiceps cristatus</i>	Great Crested Grebe	Not endemic	LC	Annex 3	KD	KD
<i>Podiceps nigricollis</i>	Black-necked Grebe	Not endemic	LC	Annex 2	KD	KD

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Pyrrhula pyrrhula</i>	Eurasian Bullfinch	Not endemic	LC	KD	Annex 1	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>Turdus merula</i>	Common Blackbird	Not endemic	LC	Annex 3	Annex 2	KD
<i>Turdus pilaris</i>	Fieldfare	Not endemic	LC	Annex 3	Annex 1	KD

1.4 Identification of Hydrobiological Biodiversity in the Impact Area of Ataköy Regulator and HEPP Facility

Project area in 4 separate alga to class belonging to total 78 taxon (type And subspecies) diagnosis has been made. Especially the Bacillariophyta (diatom) group of algae has become the richest class in terms of diversity. 52 taxa belonging to this class, 12 belonging to Chlorophyta , 11 belonging to Cyanophyta and 1 taxon belonging to Euglenophyta were found.

Project in the field, sampling stations built in all also raid class Bacillariophyta (Diatom) aspect has been found. of the region type diversity in terms of second raid group Chlorophyta And Cyanophyta is coming. This taxa Turkey's A lot from locality record has been reported as wide One It has distribution. belonging to Chlorophyta species in Spirogyra sp. type comes to the fore. The most dominant species of the Cyanophyta class is Oscillatoria sp. has happened. Species belonging to this genus have a very wide distribution profile. Dinophyta and Euglenophyta classes were found in very few numbers in terms of species number and density. General aspect diagnosis made freshwater alga species all cosmopolitan is to the region There are no specific endemic, rare or endangered species.

During the examinations carried out in the project area, a total of 13 taxa belonging to Rotifera and Copepoda, which are groups that constitute zooplanktonic organisms, were identified. The most dominant group of these is the Rotifera group. Rotifera While there are 12 taxa belonging to the phylum Brachionus calyciflorus and Keratella cochlearis species are dominant. One taxon has been identified from Copepoda , Cyclops sp. was found to be important in this group. The main factors affecting the distribution of zooplankton in freshwater systems can be classified as food, competition, mechanical relations with other living things, predation and parasitism, as well as the physical and chemical properties of the water. Depending on temperature, environmental Changes in factors affect the distribution of zooplanktonic organisms (Wetzel, 1983, Herzig , 1984). Another important factor affecting zooplankton community structure is predation . Many invertebrates and fish feed on Rotifera at least during a certain period of their lives (Herzig , 1980). In addition, current is a disadvantage in the distribution of zooplanktonic organisms.

According to the sampling at 4 different stations in the project area, a total of 17 benthic invertebrate species belonging to four major groups were identified. Of these, 2 belong to Gastropoda , 1 to Crustacea , 1 to Crustacea , and 13 to Insecta .

In aquatic ecosystems, benthic organisms have a significant proportion of indicator species. These creatures are also an indicator group of communities that are polluted or under stress, especially as a result of anthropogenic effects. According to the sampling results, no species that could be described as a pollution indicator was found. In addition, in high mountain waters and the Gammarus taxon belonging to Crustacea , which is considered to be a clean water indicator. In particular, this taxon is the dominant group in both stations and are biological indicators that indicate that the area has clean water quality.

Project in the field 6 family belonging to 16 fish taxon has been determined. These in -most more species Cyprinidae It is in the family and 10 species have been identified. These species are common and abundant in Anatolia. Gobiidae species are mostly dominant in the Black Sea basin. Among the designated species, a fish species (*Silurus*) included in the BERN Convention (Annex III) list *glanis*) is available.

Barbus according to the IUCN red list *tauricus* and *Cyprinus carpio* species are classified as VU (vulnerable) while *Salmo macrostigma* DD (data missing) *Oncorhynchus mykiss* NE (not evaluated) and all other species include species protected in LC (low risk) status. The distribution of these species in Turkey is determined by the rivers in the Central and Eastern Black Sea Region . They are basins and are not mountain range endemic species.

Table 3: Project Area and Around belonging Alga Types

BACILLIORIOPHYCEA
Order : pennales
Family: Achnanthacea
<i>Achnanthes flexella</i> there is. <i>flexella</i>
<i>Achnanthes hungarica</i>
<i>Achnanthes lanceolata</i>
<i>Achnanthes minutissima</i>
<i>cocconeis pediculus</i>
<i>cocconeis placenta</i> there is. <i>euglypta</i>
<i>cocconeis placenta</i> there is. <i>lineata</i>
Family: naviculacea
<i>amphora coffeiformis</i>
<i>amphora commutata</i>
<i>amphora normanii</i>
<i>amphora ovalis</i>
<i>amphora veneta</i>
<i>stauroneis smithii</i>
<i>anomoeoneis sphaerophora</i>
<i>anomoeoneis sphaerophora</i> there is. <i>costata</i>
<i>caloneis alpestris</i>
<i>caloneis bacillum</i>
<i>caloneis permagna</i>
<i>caloneis schumanniana</i>
<i>Cymbella affinis</i>
<i>Cymbella caespitosa</i>
<i>Cymbella cistula</i>
<i>Cymbella cymbiformis</i>
<i>Cymbella helvetica</i>
<i>Cymbella lanceolata</i>
<i>Cymbella prostrata</i>
<i>Diploneis ovalis</i>
<i>gomphonema acuminatum</i>
<i>gomphonema angustatum</i>
<i>gomphonema angustum</i>
<i>gomphonema gracile</i>
<i>gomphonema olivaceum</i>
<i>gomphonema parvalum</i>
<i>gomphonema pseudoaugur</i>
<i>gomphonema truncatum</i>
<i>gyrosigma acuminatum</i>
<i>gyrosigma attenuatum</i>
<i>Navicula capitatoradiata</i>
<i>Navicula cincta</i>
<i>Navicula cryptocephala</i>

<i>Navicula cuspidata</i>
<i>Navicula gracilis</i>
<i>Navicula nivalis</i>
<i>Navicula oblonga</i>
<i>Navicula pupula</i>
<i>Navicula pygmaea</i>
<i>Navicula radiosa</i>
<i>Navicula rhyncocephala</i>
<i>Navicula tuscula</i>
<i>Navucila bacillum</i>
<i>neidium affine</i>
<i>neidium dubium</i>
<i>pinnularia borealis</i>
<i>pinnularia microstauron</i>
<i>Rhoicosphenia abbreviata</i>
Family: Epithemiacea
<i>denticula elegance</i>
<i>denticula kuetzingii</i>
<i>Epithemia Argus</i>
<i>Epithemia sorex</i>
<i>Rhopalodia constricta</i>
<i>Rhopalodia gibba</i>
Family: Bacillariacea
<i>Bacillaria paradoxa</i>
<i>hantzschia amphioxys</i>
<i>Nitzschia amphibia</i>
<i>Nitzschia constricta</i>
<i>Nitzschia dissipate</i>
<i>Nitzschia gracilis</i>
<i>Nitzschia hantschiana</i>
<i>Nitzschia hungarica</i>
<i>Nitzschia linearis</i>
<i>Nitzschia obtusa</i>
<i>Nitzschia palea</i>
<i>Nitzschia sigmoidea</i>
<i>Nitzschia tryblionella</i>
Family: surirellacea
<i>Cymatopleura elliptica</i>
<i>Cymatopleura solea</i>
<i>surirella angusta</i>
<i>surirella brebissonii</i>
<i>surirella brightwelli</i>
<i>surirella ovalis</i>
Family: Fragilariacea
<i>diatom hiemala</i>

<i>diatom tenuis</i>
<i>diatom vulgaris</i>
<i>Fragilaria capucina</i>
<i>Fragilaria contruens</i>
<i>Fragilaria crotonensis</i>
<i>Fragilaria dilatata</i>
<i>Fragilaria parasitica</i>
<i>Fragilaria pulchella</i>
<i>Fragilaria ulna</i>
<i>Fragilaria vaucheria</i>
<i>meridion circulare</i>
Ordo : centrales
Family: Melosiraceae
<i>Melosira varians</i>
Family: Thalassiosiraceae
<i>aulacoseira granulate</i>
<i>aulacoseira ambigua</i>
<i>cyclotella comta</i>
<i>cyclotella kützingiana</i>
<i>cyclotella meneghiniana</i>
<i>cyclotella ocellata</i>
<i>stephanodiscus astrea</i>
CYANOPHYCEA
Order : Chroococcales
<i>Chroococcus minutus</i>
<i>Chroococcus turgidus</i>
<i>gomphosphaeria aponina</i>
<i>Merismopedia elegance</i>
<i>Merismopedia glauca</i>
<i>Merismopedia punctate</i>
<i>microcystis aeruginosa</i>
Order : Hormogonales
<i>anabaena komvophoron</i>
<i>anabaena spiroides</i>
<i>calothrix epiphytica</i>
<i>calothrix fusca</i>
<i>Lynbya aestuarii</i>
<i>Lynbya hieronymusii</i>
<i>nostoc commune</i>
<i>Oscillatoria agardhii</i>
<i>Oscillatoria brevis</i>
<i>Oscillatoria formosa</i>
<i>Oscillatoria imnetica</i>
<i>Oscillatoria lamosa</i>
<i>Oscillatoria rubescens</i>

<i>Oscillatoria subbrevis</i>
<i>Oscillatoria tenuis</i>
<i>spirulina laxissima</i>
<i>spirulina major</i>
<i>spirulina</i> sp.
<i>Phormidium mucicola</i>
<i>Schizothrix natans</i>
<i>Gloeotrichia echinulata</i>
Class: CHLOROPHYCEA
Order : Volvocales
<i>Chlamydomonas globosa</i>
<i>Gonium pectoral</i>
Order : Tetrasporales
<i>Gloeocystis</i> sp.
Ordo ; ulothrichales
<i>ulothrix subconstricta</i>
Order : Microsporales
<i>Microspora stagnorum</i>
Ordo ; Cladophorales
<i>Cladophora fracta</i>
<i>Cladophora glomerata</i>
Order : oedogoniales
<i>oedogonium sociale</i>
Order : chlorococcales
<i>Ankistrodesmus falcatus</i>
<i>coelastrum microporum</i>
<i>oocystic borgei</i>
<i>oocystic Crassa</i>
<i>Pediastrum borianum</i>
<i>Pediastrum duplex</i>
<i>Pediastrum simplex</i>
<i>Scenedesmus acuminatus</i>
<i>Scenedesmus ecornis</i>
<i>Scenedesmus in quadricau</i>
<i>tetrahedron minimum</i>
Order : Zygnematales
<i>Mougeotia</i> sp.
<i>Spirogyra circumlineata</i>
<i>Spirogyra dubia</i>
<i>Spirogyra</i> sp. one
<i>Spirogyra</i> sp. 2
<i>Spirogyra</i> sp. 3
<i>Zygnema ericetorum</i>
<i>Zygnema</i> sp.
Order : Desmidiales

<i>Closterium diana</i>
<i>Closterium lunula</i>
<i>cosmarium botrystis</i>
<i>cosmarium garnet</i>
<i>cosmarium margaritatum</i>
<i>staurodesmus sp.</i>
CHRYSTOPHYCEA
Order : Chrysomonadales
<i>Dinobryon sertularia</i>
EUGLENOPHYCEA
Order : Euglenales
<i>Euglena acus</i>
<i>Euglena oxyrus</i>
<i>Euglena polymorpha</i>
<i>Phacus in curvica</i>
<i>Phacus orbicularis</i>
<i>Phacus radicularis</i>
<i>trachelomonas sp.</i>
PYRROPHYCEAE
Order : peridinales
<i>ceratium hirundinella</i>
<i>glenodinium sp.</i>
<i>peridinium cinctum</i>
<i>peridinium sp.</i>

Table 4 Project Area And Around belonging zooplanktonic Types

ROTIFERA
<i>brachionus patulus</i>
<i>colurella colurus</i>
<i>colurella uncinata</i>
<i>colurella adriatica</i>
<i>colurella obtusa</i>
<i>cephalodella gibba</i>
<i>cephalodella catellina</i>
<i>cephalodella ventripes</i>
<i>cephalodella Tenuior</i>
<i>cephalodella sp</i>
<i>Dissotrocha sp.</i>
<i>Euchlanis sp.</i>
<i>keratella tecta</i>
<i>Lecane hamata</i>
<i>lepadella patella</i>
<i>lepadella quadricarinata</i>
<i>lepadella sp.</i>
<i>Lindia sp.</i>

<i>polyarthra remata</i>
<i>proales theodora</i>
<i>proales fallaciosa</i>
<i>philodina megalotrocha</i>
Bedelloid rotifer
CLADOCERA
<i>Moina sp.</i>
<i>Alona rectangular</i>
IN COPEPO
<i>cyclops sp.</i>
Nauplius

Table 5 Project Area And Around belonging benthic organisms

Branch: ANNELIDA
Class: CLITELLATA
Set: HIRUDINEA
Family: Erpobdellidae
<i>Erpobdella sp.</i>
Class: OLIGOCHAETA
Set: LUMBRICULIDAE
<i>Lumbriculus variegatus</i> (Müller, 1774)
Set: TUBIFICIDA
Family: tubificidae
<i>tubifex tubifex</i> (Müller,1774)
<i>limnodrilus udekemianus</i> Claparède , 1862
<i>potamotheix hammoniensis</i> (Michaelsen , 1901)
Family: Naididae
<i>Nais communis</i> Piguet , 1906
<i>Nais variabilis</i> Piguet , 1906
<i>Nais elinguis</i> Müller, 1773
<i>Pristinella jenkiniae</i> (Stephenson , 1931)
Branch: ARTHROPODA
Class: CRUSTACEA
Set: AMPHIPODA
Family: Gammaridae
<i>gammarus pulex</i>
Set: IN DECAPO
Family: Oniscidae
<i>Potamon sp.</i>
Class: INSECTA
Set: HEMIPTERA
Family: Corixidae (nymph)
<i>Micronecta sp.</i>
Family: Hydrometridae
<i>hydrometra sp.</i>

Family:Corixidae
<i>Corixa</i> sp.
Family:Gerridae
<i>Geris</i> sp.
Family:Notonectidae
<i>notonecta</i> sp.

Table 6: Project Area and Around Found Fish Types And Protection Status

				Ekzotik	Doğal	Endemik	Kaynak	BERN	ERL	CITES
Latin Name	Authority	Family	Common Name							
<i>Atherina boyeri</i>	Risso 1810	Atherinidae	Big-scale sand-smelt	-	X	-	*	-	LC	-
<i>Oxynoemachellus angorae</i>	Steindachner, 1897	Balitoridae	Angora loach	-	X	End.	*	-	LC	-
<i>Alburnoides eichwaldii</i>	(Bloch 1782)	Cyprinidae	Schneider	-	X	-	*	-	LC	-
<i>Barbus tauricus</i>	Kessler, 1877	Cyprinidae	Crimean Barbel	-	X	-	*	-	VU	-
<i>Barbus escherichi</i>	Steindachner, 1897	Cyprinidae	Kura Barbel	-	X	-	*	-	LC	-
<i>Capoeta banarescui</i>	Turan, 2006	Cyprinidae	Banarescu's Barbel	-	X	End.	*	-	LC	-
<i>Capoeta sieboldii</i>	Steindachner, 1864	Cyprinidae	Colchic Khrumulya	-	X	-	*	-	LC	-
<i>Alburnus derjugini</i>	(Gueldenstaedt 1772)	Cyprinidae	Danubian Bleak	-	X	-	*	-	LC	-
<i>Chondrostoma regium</i>	(Heckel, 1843)	Cyprinidae	Brond Snout	-	X	-	*	-	LC	-
<i>Cyprinus carpio</i>	(Linnaeus, 1758)	Cyprinidae	Common Carp	-	X	-	*	-	VU	-
<i>Scardinius erythrophthalmus</i>	(Linnaeus, 1758)	Cyprinidae	Rudd	-	X	-	*	-	LC	-
<i>Squalius cephalus</i>	(Linnaeus, 1758)	Cyprinidae	Chub	-	X	-	*	-	LC	-
<i>Knipowitschia caucasica</i>	(Kessler, 1877)	Gobiidae	Caucasian Dwarf Goby	-	X	-	*	-	LC	-
<i>Silurus glanis</i>	(Linnaeus, 1758)	Siluridae	Wels	-	X	-	*	App. III	LC	-
<i>Salmo macrostigma</i>	(Duméril, 1858)	Salmonidae	Mountain Trout	-	X	-	*	-	DD	-
<i>Oncorhynchus mykiss</i>	(Walbaum, 1792)	Salmonidae	Rainbow Trout	X	-	-	*	-	NE	-

*	: Literatür'den alınan yayılış bilgileri
*	: Bu çalışmada yakalanan balık türleri
*	: Tarafımızdan önceki yıllarda aynı nehir/çay sistemlerinde yakalanan balık türleri

1.5 Biodiversity Risk Evaluation

1.5.1 Flora

Guidance in terms of floristics at the Ataköy Regulator and HEPP facility site Considering the Note 6 criteria, since there are no plant taxa with CR and EN status, critical species and habitat assessments were not made within the scope of IFC.

➤ 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 7). 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, in order 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 7 Project in the field Found And Finding Likely Invader Species

<i>Acer negundo</i> (ash tree leafy maple) Areas open to andropogenic influence	
<i>Agropyron repens</i> (Separate herb) Field, open area	
<i>Ailanthus altissima</i> (Kokarağaç) andropogenic to the effect open spaces	
<i>Amaranthus retroflexus</i> (Fox dry) Field, open area	

Boreava orientalis (Sariat) Field, roadside



chenopodium album (While crying) Flood, flood bearings



Cirsium arvense (Köygöçüren) Flood, flood bearings



conyza canadensis (cypress) andropogenic to the effect open fields



conyza bonariensis (Coyote) andropogenic to the effect open fields



conyza albida (Maplewort) andropogenic to the effect open spaces



Cuscuta campestris (Turkish) meadow-pasture habitats



Lepidium draba (Diġnik) andropogenic to the effect open spaces



nasturtium officinale (Suteresi) streamside



Reseda lutea (Love flower) Path edge, field



rumex acetocella (Sorrel) Path edge, field And barren places



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

Paspalum distichum (This discrete) This communities inside on channels



Robinia pseudoacacia (White flowering liar acacia) roadsides



Xanthium strumarium (Big Pitarak) Flood, flood bearings



Xanthium spinosum (Yellow Pitarak) Flood, flood bearings



Viscum album (Lime herb) to the trees interference



1.5.2 Fauna

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

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.

Lynx Risk assessment for 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 is highly likely. There is no direct threat to the species. The species will continue to exist as long as there is sufficient life water in the stream beds .

1.5.3 Ornithology

IFC PS-6 and Guidance Taking into account the Note 6 criteria, the “critical species” evaluation and “critical habitat” evaluation were made in section 5 , and there are no Critical species in terms of birds in the region.

It has been determined that there are many water birds in the Almus Dam Lake from which Ataköy HEPP receives water and along the Yeşilırmak River. However, due to the location of the facility and the good water flow from the facility in all seasons, it has been evaluated that the facility does not pose a serious risk to these birds or other birds.

1.5.4 Hydrobiology

There are no intensive fishing activities in the region. Domestic and industrial pollution sources of residential areas in the upper basin of Ataköy significantly threaten the existence and density of fish species. These species are widespread and abundant in the inland waters of all Anatolia.

Rivers are complex and dynamic ecosystems. By changing these areas, lotic species will be affected and reduced by the loss of breeding grounds along with significant environmental change. River species normally live and spawn in shallow places and look for such habitats after the formation of the dam lake. If they cannot find it, they face losing competition with other lentic species due to the difference in their ecological niches. After the formation of such areas in HEPP-like applications, areas where some species can live should also be protected. Aquatic species; It adapts to the living conditions in a particular river section and creates characteristic biocoenoses shaped by the change of abiotic factors along the stream (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.

1.5.5 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 ,
- weather 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 8 .

Table 8 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. Regarding the issue dated 26.06.2021 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	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; 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. 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".
		Medical Wastes	For medical waste generated within the scope of the activity; waste at the source -most member will download system establishment 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, 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.
		Waste Electronic Things	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.
		Waste oils	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

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 06.06.2015 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 subjected to package treatment and discharged to the receiving environment. In this context, within the scope of domestic wastewater generated during the operation phase, the provisions of the "Water Pollution Control Regulation", which came into force after being published in the Official Gazette No. 25687 dated 31.12.2004, must be complied with. An analysis must be made by accredited companies by applying to the MELBES system of the Ministry of Environment, Urbanization and Climate Change from the package treatment outlet. In addition, the provisions of the Water Pollution Control Regulation and the Regulation on the Protection of Drinking-Use Water Basins must be complied with during the operation.

Permit within the scope of the Environmental Permit and License Regulation , and it has been determined that no application has been made within this scope. It is necessary to apply for a Wastewater Environmental Permit immediately for the facility in question within the scope of the Environmental Permit and License Regulation.

Atakoy regulator And hes facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
AT1	Business	Fauna Conservation of Species	Project Area And surroundings	Tortoise (<i>Testudo Graeca</i>) Species. Pay Attention to Certain Points of the Project Area Tortoise may come out signs It must be placed.	Biologists who are experts on the subject Training Should Be Provided by	During Operation	April-May 2024 one Times
AT2	All Habitats	Fauna Conservation of Species	Project Area And surroundings	Otter (<i>Lutra Lutra</i>) Species Project Area And Around It Should Be Researched And Training Should Be Provided.	By Expert Biologists Species/ Population Level Monitoring	During Operation	2024 Year September Bear 1 Time
AT3	Business	Fauna Conservation of Species	Project Area And surroundings	Lynx About the Lynx) Species Facility To its employees Education should be given	Biologists who are experts on the subject By Education should be given	During Operation	April-May 2024
AT4	Business	Fauna Conservation of Species	Project Area And surroundings	Anatolia Rough Salamander (<i>Triturus Anatolicus</i>) About the Species Facility Employees Should Be Provided Training	Biologists who are experts on the subject Training Should Be Provided by	During Operation	April-May 2024
AT5	Business	Fauna Conservation of Species	Project Area And surroundings	Caucasian Nosed viperspecies About Facility Employees Should Be Provided Training	subject professional biologists Training Should Be Provided by	During Operation	April-May 2024
AT6	Business	Fauna Conservation of Species	Project Area And surroundings	Pet Cats Should Never Be Keeped in the Facility. Although it is recommended not to have a pet dog, Even Especially Night Free They Should Not Be Allowed To Roam	Company By	During Operation	April-May 2024

Atakoy regulator And hes facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
AT7	Business	Fauna Conservation of Species	Project Area And surroundings	in the region Bear (<i>Ursus Arctos</i>) is available. Human-Bear Encounters Can Sometimes Be Dangerous. bears To the region Garbage containing food should never be left open in the facility to avoid shrinkage. A Garbage Management plan How to Prepare and Store and Remove Garbage That May Attract Bears About APPLICATION It must be reported.	Company By	During Operation	Continually
AT8	Business	Fauna Conservation of Species	Project Area And surroundings	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 Give to Animals It is necessary.	Company By	During Operation	Continually
AT9	All Habitats	Invader Blocking Species	Project Area And surroundings	Investigation of Invasive Species Found in the Project Area and Surroundings Project Area And Around by watching Dismantling Plan Must Be Prepared	Population by Expert Biologists Level Monitoring	During Operation	one Year Duration in July and August
AT10	Business	Environmental Pollution Prevention	Project Area	Business inside Formed Waste Codes of Hazardous Wastes Suitable in the figure	Company By	During Operation	6 on the moon one

Atakoy regulator And hes facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
				Licensed Companies Recycling /Disposal by to its facilities Must be Delivered .			
AT11	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
AT11	Business	Prevention of Environmental Pollution	Project Area	Ensuring Control of Domestic Wastewater It is necessary. In this context, from the package purification exit Environment, Ministry of Urbanization and Climate Change, analyzed by accredited companies by applying through the MELBES system. to have it done is required	Company By	During Operation	4 on the moon one
AT11	Business	Regulatory Compliance	Project Area	Obtaining Air-Related Environmental Permit It is necessary.	Company By / Environmental Officer / Environmental Consultancy Firm	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	

KIZILDERE -I JES FACILITY BIODIVERSITY ACTION PLAN

1.1 Introduction

Kızıldere Geothermal Power Plant is located in the Sarayköy district of Denizli. Operated by Zorlu Natural Electricity Generation Inc., a subsidiary of Zorlu Energy, the plant has an installed capacity of 15 MWe, making it Turkey's 671st largest power plant and Denizli's 14th largest energy facility. Additionally, it ranks as Turkey's 43rd largest geothermal power plant. The Kızıldere (Zorlu) GPP generates an average of 78,793,377 kilowatt-hours of electricity, sufficient to meet the daily electricity needs of approximately 21,694 people, covering residential, industrial, metro transportation, governmental offices, and street lighting requirements. When considering only residential electricity consumption, Kızıldere (Zorlu) GPP can supply the energy needs of approximately 26,379 households.

The Kızıldere-I GPP site is located about 7 km away from the village of Sarayköy. Additionally, the project area is approximately 8 km from the village of Buharkent, 9 km from the village of Buldan, and 15 km from the village of Yayla. The project site is also around 22 km from Denizli, 24 km from Pamukkale, and 43 km from the significant center of Nazilli (Figure 3-4).

There are notable wetlands around the Kızıldere-I GPP site. The site is approximately 36.5 km away from Afşar Dam, 20 km from Derbent Dam, 38 km from Adıgüzel Dam, 50 km from Kemer Dam, 82 km from Salda Lake, and 77 km from Acıgöl Lake (Figure 5).



Figure 1: Satellite Image of the Project Site



Figure 2: Satellite Image of the Project Site - 2

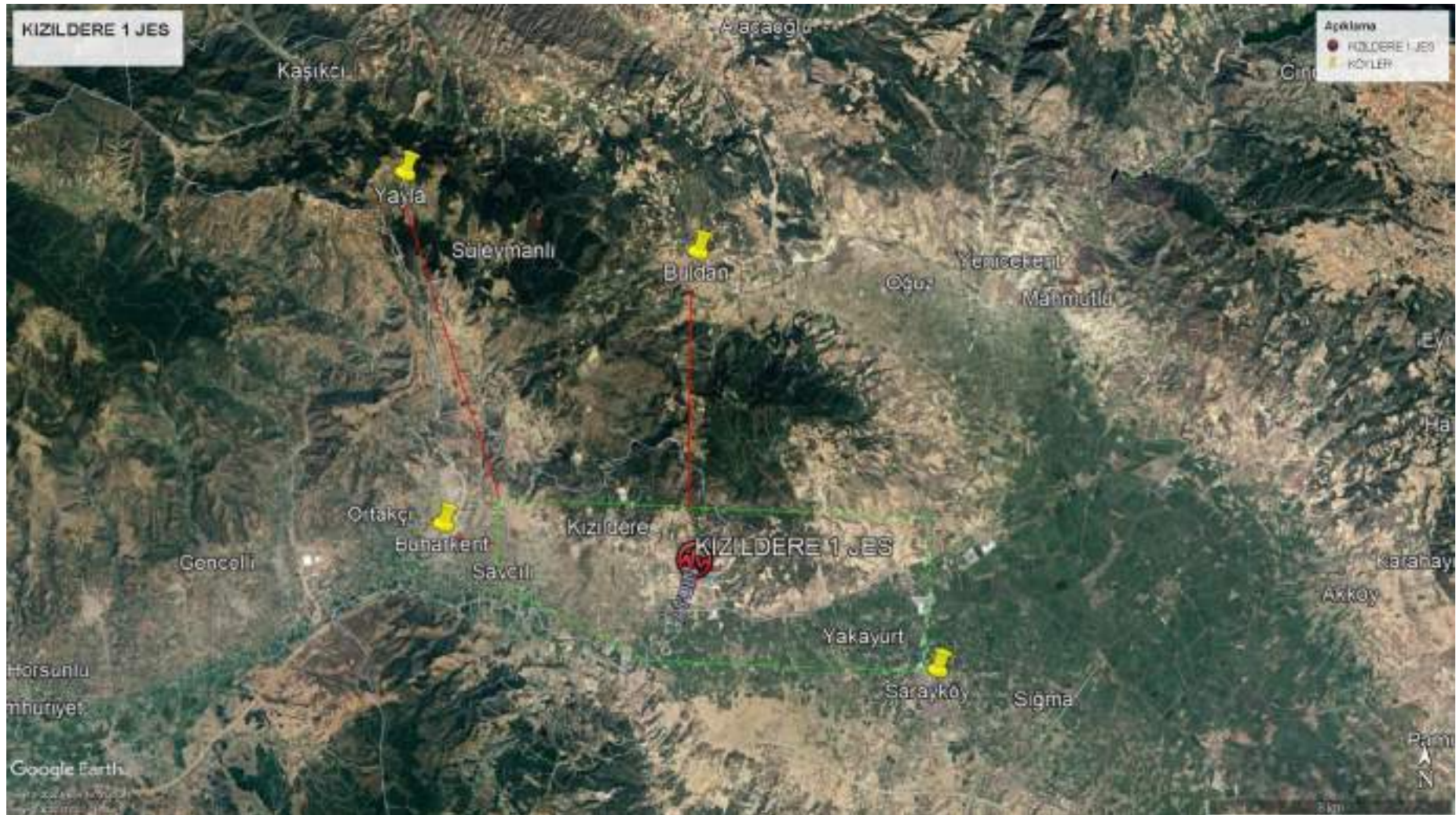


Figure 3: Villages (Neighborhoods) in the Vicinity of the Project Site



Figure 4: Settlements Near the Project Site

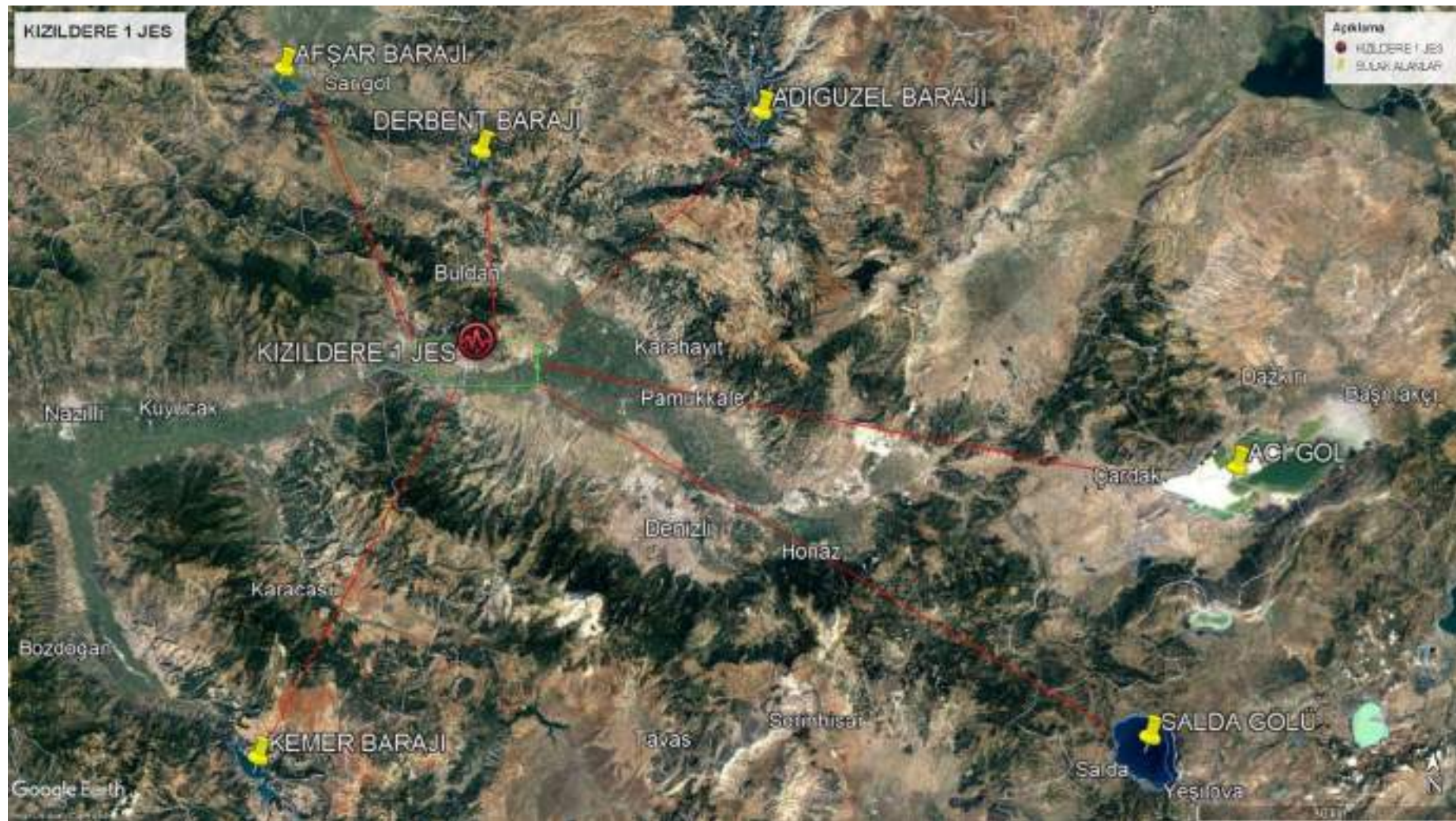


Figure 5: Significant Water Bodies Surrounding the Project Site

1.2 Relationship of the Area with Protected and Special Status Areas

When evaluating the Kızıldere 1 Geothermal Power Plant (GPP) site in relation to nearby protected areas and important natural sites, Honaz Mountain National Park is located approximately 39 km away, and Honaz Mountain (small area) is about 40 km away in a straight line from the project site. Additionally, the Bozdağlar Important Natural Area is approximately 36 km away in a straight line (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 Kızıldere-I Geothermal Power Plant Facility

The Kızıldere-I Geothermal Power Plant (GPP) project, operated by Zorlu Doğal Elektrik Üretimi A.Ş., is located within the borders of Sarayköy district in Denizli province.

There are 11 different habitat types within the project area. Of these habitats, 3 are natural, while the remaining 8 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, as detailed below (Figure 8).



Kızıldere-1 JES EUNIS Habitat Haritası

Ölçek: 1: 6,000

0 125 250
Meters

- ** Tesis binaları
- ** E2.64: Çimlik alanlar, park çimlikleri
- * E2 : Mezik çayırlar
- * G5 : Antropojenik ormanlar, baltalıklar, ağaç sıraları
- * H5 : Bitki örtüsü seyrek açıklık alanlar
- ** J2.1 : Kırsaldaki aktif kullanılan dağınık konutlar
- ** J2.3 : Kırsaldaki aktif kullanılan endüstriyel yapılar
- ** J4.2 :Yol ağları
- ** J4.6 : Kaldırımlar, beton yüzeyler, rekreasyon alanları
- ** J5.3 : İnsan yapımı durağan su gövdeleri
- ** J5.42 : Endüstriyel kazı sahalarından çıkan sıradışı kimyali su
- ** J6.1 : Bina yıkım ve inşaat atıklarının depolandığı alanlar

Figure: 8 Kızıldere-I JES EUNIS habitat Map one

➤ Natural Habitats E2

Mezik Meadows

In this habitat observed at an altitude of 180 m within the facility area; *Barbarea plantaginea* , *Oenothera glazioviana* , *Inula aucherana* , *Gnaphalium luteo-album* subsp. *leuto -album* , *Conyza canadensis* , *Cirsium creticum* subsp. *creticum* , *Centaurea hierapolitana* , *Periploca graeca* there is. *graeca* , *Myosotis sylvatica* subsp. *cyanea* , *Prunella vulgaris*, *Euphorbia falcata* subsp. *macrostegia* , *Galium rivale* plant taxa were identified.



Photos1: Mezik meadows (EUNIS:E 2)

G5 anthropogenic Forests, coppice Forests

In the habitat that starts within the 250 m facility area and continues outside; *genista acanthoclada* ; *Pinus Nigra* subsp.*nigra* var. *caramanica* , *Alyssum sibiricum* , *Cistus laurifolius* , *Vicia cuspidata* , *Lathyrus digitatus* , *Dorycnium pentaphyllum* subsp.*anatolicum* , *Bunium ferulaceum* , *Helichrysum plicatum* subsp.*plicatum* , *Cirsium vulgare* , *Centaurea solstitialis* subsp.*solstitialis* , *Xeranthemum inapertum* , *Crepis foetida* subsp . *commutata* , *Jasminum fruticans* , *Onosma aucheranum* , *Scrophularia floribunda* , *Veronica cymbalaria* , *Veronica triloba* , *Scutellaria orientalis* subsp.*alpina* var. *glandulosissima* , *Origanum sipyleum* , *Salvia frigida* , *plantago major* subsp . *intermedia*, *Viscum album* subsp . *austriacum* , *Allium atroviolaceum* There are plant taxa.



Photos2: Anthropogenic Forests, coppices, Tree rows (EUNIS:G 5)

H5 Herb Cover Rare Openness Fields

The facility is at an altitude of 230 m; *consolida regalis subsp.paniculata* var. *paniculata* , *Isatis glauca subsp . glauca* , *Alyssum dasycarpum* var. *dasycarpum* , *Fumana procumbens* , *Gypsophila perfoliata* var. *perfoliata* , *Atriplex rosea* , *Linum tenuifolium* , *Peganum harmala* , *Haplophyllum buxbaumii subsp . buxbaumii* , *Echinophora tournefortii* , *Bunium ferulaceum* , *Anthemis cretica subsp. tenuiloba* , *Achillea biebersteinii* , *Jurinea consanguinea* , *Carthamus dentatus* , *Tragopogon latifolius* var. *latifolius* , *Crepis foetida subsp . commutata* , *Marrubium parviflorum subsp . parviflorum* , *Ecballium elaterium* , *Inula viscosa* , *Phragmites australis* , *Tamarix tetrandra* , *Juncus acutus* plant taxa were identified.



Photos3: plant Cover Rare Openness Fields (EUNIS:H5)

➤ **Modified Habitats**

J2.1, J2.3, Areas with habitat codes J4.2, J5.42, J6.1 are concrete, chemical water and asphalt and do not have floral content. However, cleaning the seeds that germinate in the cracks in these structures is important for the integrity of the system. Care should be taken to ensure that the plants used for landscaping and food purposes in the habitat coded E2.64 and J4.6 are not invasive species .



Photos 4 :Path networks With sidewalks And Recreation Fields (EUNIS: J4.2 And J4.6)



Photos 5 :Person making Salty Non This channels (EUNIS: J5.41)



Photos 6 :Person making Underground Stream lines (EUNIS: J5.43)



Photos 7: *ecballium elaterium*



Photos 8 : *inula viscose*



Photos 9: *juncus acutus*



Photos 10: *phragmites australis*



Photos 11: th *tamarix tetrandra*

1.4 Kızıldere-I JES facility Effect in the field floristic biodiversity Definition

When we look at the vegetation of the project site and its surroundings; Most of it has a steppe character with open areas with sparse vegetation. While there are reeds, reeds and tamarisks in the seasonally flowing dry stream beds of the area, there are degraded coppice forests towards the hilly areas. In areas where surface flow is high and affected by construction activities at the establishment stage, ruderal vegetation prevails.

Guidance in terms of floristics at the KIZILDERE-I GPP facility site Considering the Note 6 criteria when taken C.R. And MOST in status herb taxon available because it is not IFC No critical species and habitat assessment has been made within the scope of this study.

There are hilly areas along the borders of the facility that may be affected by surface flows, and terracing works to be carried out in these areas will allow the formation of a more stable vegetation cover both inside and outside the facility. It is important for this area to carry out such applications on sloping areas within the facility, which will slow down the surface flow rate due to excessive rainfall .

The same applies to seasonally flowing dry stream beds. With the rehabilitation works to be carried out in dry stream beds, mud, stone and silt accumulations will be better drained. will be done.

1.5 Kızıldere-I JES facility Effect in the field faunistic Defining Biodiversity

1.5.1 Amphibian

There is no endangered and/or endemic amphibian species in the project area. located in the area amphibian types widespread species. Project in the field amphibians in terms of One immortality and the precautions to be taken are not foreseen. On the contrary, during the transportation of project-sourced water to some areas, water leaking into the ground at some points creates suitable spots for amphibians .

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

The only reptile species in the project area that is vulnerable to extinction according to IUCN lists **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. Also in the region **is the Anatolian lizard (*Anatololacerta*)**, a largely endemic lizard. ***anatolicus*)** is distributed. This species has a wide distribution from the Büyük Menderes River northward to the Marmara Region. The IUCN category is LC .

There are no reptile species that are likely to be directly affected by the project. The facilities have been operating in the region for many years. Although there may be species affected by the project during the construction phase, the facilities do not emit any emissions such as noise, dust, or polluted air into the environment during the current operation phase.

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

Criterion 1: Refers to Critically Endangered (CR) and /or Endangered (EN) Species. 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. It refers to Endemic and/or Narrowly Ranged Species. It refers to Endemic and/or Narrowly Ranged Species. **Anatolian lizard (*Anatololacerta*)** , which is endemic to the project site ***anatolicus***) is distributed. The distribution area of this endemic species is more than 50,000 square kilometers (km²). is too much. Project area This your species spherical population the size of $\geq 10\%$ And One your species reproductive of unit

It is not possible to say that there is an area that regularly hosts ≥ 10 of them. This According to the available information, the project site **does not meet the threshold value for Criterion 2.**

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

in the region generation in danger and/or endemic One mammal There is no type .

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 areas 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 connection also extends across elevation and climate gradients and across crest-to- coast to coast)” also includes biological corridors.

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 Kızıldere-I GPP 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 a large number of 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 151 bird species were identified in the project area and its immediate surroundings. The list of these species, their global Red List status, and the status of the species in BERN, CITES and MAK decisions of 2022 are given in Table 1 below.

Facility around found bird from types 3 of grain generation spherical on scale threatening is below. These species are Elmabaş Patka (*Aythya ferina*), Küçük Sakarca (*Anser erythropus*) and turtle dove (*Streptopelia turtur*) species, and the most current Red List assessments of all of these species are in the “VU” category, that is, sensitive (IUCN, 2022). Of the species found around the facilities, 102 are in BERN Agreement Annex-2, 39 are in BERN Agreement Annex-3, 1 of them is included in CITES Annex-1 and 13 of them are included in CITES Annex-2.

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

Habitats Important to Critically Endangered (CR) or Endangered (EN) Species

No “CR” or “EN” category bird species were detected around the facilities. Therefore, this criterion is not triggered.

Criterion 2: endemic And Narrow widespread Species For Important Habitats

Facility These are the birds around criterion It does not trigger.

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

The Kızıldere-I GPP site does 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.

Table1: Project in the field Found and Finding Likely Bird Types

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Accipiter nisus</i>	Eurasian Sparrowhawk	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Acrocephalus arundinaceus</i>	Great Reed Warbler	Not Endemic	LC	Annex 2	KD	KD
<i>Acrocephalus melanopogon</i>	Moustached Warbler	Not Endemic	LC	Annex 2	KD	KD
<i>Acrocephalus schoenobaenus</i>	Sedge Warbler	Not Endemic	LC	Annex 2	KD	KD
<i>Acrocephalus scirpaceus</i>	Eurasian Reed Warbler	Not Endemic	LC	Annex 2	KD	KD
<i>Actitis hypoleucos</i>	Common Sandpiper	Not Endemic	LC	Annex 2	KD	KD
<i>Alauda arvensis</i>	Eurasian Skylark	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Alcedo atthis</i>	Common Kingfisher	Not Endemic	LC	Annex 2	KD	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
<i>Anas platyrhynchos</i>	Mallard	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Anser albifrons</i>	Greater White-fronted Goose	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Anser erythropus</i>	Lesser White-fronted Goose	Not Endemic	VU	Annex 2	KD	KD
<i>Anthus cervinus</i>	Red-throated Pipit	Not Endemic	LC	KD	KD	KD
<i>Anthus pratensis</i>	Meadow Pipit	Not Endemic	LC	Annex 2	KD	KD
<i>Anthus spinoletta</i>	Water Pipit	Not Endemic	LC	Annex 2	KD	KD
<i>Apus apus</i>	Common Swift	Not Endemic	LC	Annex 3	KD	KD
<i>Apus melba</i>	Alpine Swift	Not Endemic	LC	Annex 2	KD	KD
<i>Ardea alba</i>	Great Egret	Not Endemic	LC	Annex 2	KD	KD
<i>Ardea cinerea</i>	Grey Heron	Not Endemic	LC	Annex 3	Annex 1	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>Athene noctua</i>	Little Owl	Not Endemic	LC	Annex 2	KD	Annex 2

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Aythya ferina</i>	Common Pochard	Not Endemic	VU	Annex 3	Annex 2	KD
<i>Aythya nyroca</i>	Ferruginous Duck	Not Endemic	NT	Annex 3	KD	KD
<i>Botaurus stellaris</i>	Great Bittern	Not Endemic	LC	Annex 2	KD	KD
<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>Calidris alba</i>	Sanderling	Not Endemic	LC	Annex 2	KD	KD
<i>Calidris alpina</i>	Dunlin	Not Endemic	LC	Annex 2	KD	KD
<i>Calidris minuta</i>	Little Stint	Not Endemic	LC	Annex 2	KD	KD
<i>Calidris pugnax</i>	Ruff	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Carduelis carduelis</i>	European Goldfinch	Not Endemic	LC	Annex 2	KD	KD
<i>Cecropis daurica</i>	Red-rumped Swallow	Not Endemic	LC	Annex 2	KD	KD
<i>Cettia cetti</i>	Cetti's Warbler	Not Endemic	LC	Annex 2	KD	KD
<i>Charadrius alexandrinus</i>	Kentish Plover	Not Endemic	LC	Annex 2	KD	KD
<i>Charadrius dubius</i>	Little Ringed Plover	Not Endemic	LC	Annex 2	KD	KD
<i>Charadrius hiaticula</i>	Common Ringed Plover	Not Endemic	LC	Annex 2	KD	KD
<i>Chlidonias hybrida</i>	Whiskered Tern	Not Endemic	LC	Annex 2	KD	KD
<i>Chlidonias leucopterus</i>	White-winged Tern	Not Endemic	LC	Annex 2	KD	KD
<i>Chloris chloris</i>	European Greenfinch	Not Endemic	LC	Annex 2	KD	KD
<i>Chroicocephalus ridibundus</i>	Black-headed Gull	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Ciconia ciconia</i>	White Stork	Not Endemic	LC	Annex 2	KD	KD
<i>Ciconia nigra</i>	Black Stork	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Circaetus gallicus</i>	Short-toed Snake Eagle	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Circus aeruginosus</i>	Western Marsh Harrier	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Circus cyaneus</i>	Hen Harrier	Not Endemic	LC	Annex 2	KD	Annex 2

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Cisticola juncidis</i>	Zitting Cisticola	Not Endemic	LC	KD	KD	KD
<i>Clamator glandarius</i>	Great Spotted Cuckoo	Not Endemic	LC	Annex 2	KD	KD
<i>Columba livia</i>	Rock Dove	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Columba palumbus</i>	Common Wood Pigeon	Not Endemic	LC	KD	Annex 2	KD
<i>Coracias garrulus</i>	European Roller	Not Endemic	LC	Annex 2	KD	KD
<i>Corvus corax</i>	Common Raven	Not Endemic	LC	Annex 3	Annex 1	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>Curruca melanocephala</i>	Sardinian Warbler	Not Endemic	LC	Annex 2	KD	KD
<i>Cyanistes caeruleus</i>	Eurasian Blue Tit	Not Endemic	LC	Annex 2	KD	KD
<i>Cygnus columbianus</i>	Tundra Swan	Not Endemic	LC	KD	KD	KD
<i>Delichon urbicum</i>	Common House Martin	Not Endemic	LC	Annex 2	KD	KD
<i>Dendrocopos syriacus</i>	Syrian Woodpecker	Not Endemic	LC	Annex 2	KD	KD
<i>Egretta garzetta</i>	Little Egret	Not Endemic	LC	Annex 2	KD	KD
<i>Emberiza caesia</i>	Cretzschmar's Bunting	Not Endemic	LC	Annex 2	KD	KD
<i>Emberiza calandra</i>	Corn Bunting	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Emberiza cirrus</i>	Cirl Bunting	Not Endemic	LC	Annex 2	KD	KD
<i>Emberiza citrinella</i>	Yellowhammer	Not Endemic	LC	Annex 2	KD	KD
<i>Emberiza melanocephala</i>	Black-headed Bunting	Not Endemic	LC	Annex 2	KD	KD
<i>Emberiza schoeniclus</i>	Common Reed Bunting	Not Endemic	LC	Annex 2	KD	KD
<i>Erithacus rubecula</i>	European Robin	Not Endemic	LC	Annex 2	KD	KD
<i>Falco columbarius</i>	Merlin	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Falco eleonora</i>	Eleonora's Falcon	Not Endemic	LC	Annex 2	KD	Annex 2

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Falco peregrinus</i>	Peregrine Falcon	Not Endemic	LC	Annex 2	KD	Annex 1
<i>Falco tinnunculus</i>	Common Kestrel	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Ficedula hypoleuca</i>	Pied Flycatcher	Not Endemic	LC	Annex 2	KD	KD
<i>Fringilla coelebs</i>	Common Chaffinch	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Fulica atra</i>	Eurasian Coot	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Galerida cristata</i>	Crested Lark	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Gallinago gallinago</i>	Common Snipe	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Gallinula chloropus</i>	Common Moorhen	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Garrulus glandarius</i>	Eurasian Jay	Not Endemic	LC	KD	Annex 2	KD
<i>Gelochelidon nilotica</i>	Gull-billed Tern	Not Endemic	LC	Annex 2	KD	KD
<i>Himantopus himantopus</i>	Black-winged Stilt	Not Endemic	LC	Annex 2	KD	KD
<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>Ixobrychus minutus</i>	Little Bittern	Not Endemic	LC	Annex 2	KD	KD
<i>Lanius collurio</i>	Red-backed Shrike	Not Endemic	LC	Annex 2	Annex 1	KD
<i>Lanius minor</i>	Lesser Grey Shrike	Not Endemic	LC	Annex 2	KD	KD
<i>Lanius senator</i>	Woodchat Shrike	Not Endemic	LC	Annex 2	KD	KD
<i>Linaria cannabina</i>	Common Linnet	Not Endemic	LC	Annex 2	KD	KD
<i>Lullula arborea</i>	Woodlark	Not Endemic	LC	Annex 3	Annex 1	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>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>Motacilla alba</i>	White Wagtail	Not Endemic	LC	Annex 2	KD	KD

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Motacilla cinerea</i>	Grey 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>Netta rufina</i>	Red-crested Pochard	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Oenanthe finschii</i>	Finsch's Wheatear	Not Endemic	LC	Annex 2	KD	KD
<i>Oenanthe isabellina</i>	Isabelline Wheatear	Not Endemic	LC	Annex 2	Annex 1	KD
<i>Oenanthe melanoleuca</i>	Eastern Black-eared Wheatear	Not Endemic	LC	Annex 2	KD	KD
<i>Oenanthe oenanthe</i>	Northern Wheatear	Not Endemic	LC	Annex 2	Annex 1	KD
<i>Parus major</i>	Great Tit	Not Endemic	LC	Annex 2	KD	KD
<i>Passer domesticus</i>	House Sparrow	Not Endemic	LC	KD	Annex 2	KD
<i>Passer hispaniolensis</i>	Spanish Sparrow	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Passer montanus</i>	Eurasian Tree Sparrow	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Petronia petronia</i>	Rock Sparrow	Not Endemic	LC	Annex 2	KD	KD
<i>Phalacrocorax carbo</i>	Great Cormorant	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Phoenicopterus roseus</i>	Greater Flamingo	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Phoenicurus ochrurus</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>Pica pica</i>	Eurasian Magpie	Not Endemic	LC	Annex 2	KD	KD
<i>Platalea leucorodia</i>	Eurasian Spoonbill	Not Endemic	LC	Annex 2	KD	KD
<i>Plegadis falcinellus</i>	Glossy Ibis	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>Motacilla cinerea</i>	Grey Wagtail	Not Endemic	LC	Annex 3	Annex 1	KD

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Recurvirostra avosetta</i>	Pied Avocet	Not Endemic	LC	Annex 2	KD	KD
<i>Regulus regulus</i>	Goldcrest	Not Endemic	LC	Annex 2	KD	KD
<i>Remiz pendulinus</i>	Eurasian Penduline Tit	Not Endemic	LC	Annex 3	KD	KD
<i>Saxicola rubetra</i>	Whinchat	Not Endemic	LC	Annex 2	KD	KD
<i>Saxicola rubicola</i>	Common Stonechat	Not Endemic	LC	Annex 2	KD	KD
<i>Serinus serinus</i>	European Serin	Not Endemic	LC	Annex 2	KD	KD
<i>Sitta neumayer</i>	Rock Nuthatch	Not Endemic	LC	Annex 2	KD	KD
<i>Spatula clypeata</i>	Northern Shoveler	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Spatula querquedula</i>	Garganey	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Streptopelia decaocto</i>	Eurasian Collared Dove	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Streptopelia senegalensis</i>	Laughing Dove	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Streptopelia turtur</i>	European Turtle Dove	Not Endemic	VU	Annex 3	Annex 2	KD
<i>Sturnus vulgaris</i>	Common Starling	Not Endemic	LC	KD	Annex 1	KD
<i>Sylvia atricapilla</i>	Eurasian Blackcap	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>Tadorna tadorna</i>	Common Shelduck	Not Endemic	LC	Annex 2	KD	KD
<i>Tringa erythropus</i>	Spotted Redshank	Not Endemic	LC	Annex 2	KD	KD
<i>Tringa glareola</i>	Wood Sandpiper	Not Endemic	LC	Annex 2	KD	KD
<i>Tringa nebularia</i>	Common Greenshank	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Tringa ochropus</i>	Green Sandpiper	Not Endemic	LC	Annex 2	KD	KD
<i>Tringa stagnatilis</i>	Marsh Sandpiper	Not Endemic	LC	Annex 2	KD	KD
<i>Tringa totanus</i>	Common Redshank	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Troglodytes troglodytes</i>	Eurasian Wren	Not Endemic	LC	Annex 2	KD	KD

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Turdus merula</i>	Common Blackbird	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Turdus philomelos</i>	Song Thrush	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Turdus viscivorus</i>	Mistle Thrush	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Tyto alba</i>	Barn Owl	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Upupa epops</i>	Eurasian Hoopoe	Not Endemic	LC	Annex 2	KD	KD
<i>Vanellus spinosus</i>	Spur-winged Lapwing	Not Endemic	LC	Annex 2	KD	KD
<i>Vanellus vanellus</i>	Northern Lapwing	Not Endemic	NT	Annex 3	Annex 1	KD
<i>Zapornia parva</i>	Little Crane	Not Endemic	LC	Annex 2	KD	KD

1.6 Identification of Hydrobiological Biodiversity in the Kızıldere-I GPP Facility Impact Area

In the study conducted at Kızıldere I GPP facilities, no algae, zooplankton, benthic aquatic organisms or fish were found. However, it has been determined that there is seasonal flow in the stream beds within the facility. These flows generally occur in the spring and occur after rainfall. occurred for when the rains are over It is drying. This for this reason Any aquatic creature cannot show signs of life.

the seasonal flow carries sediment , an embankment dam was created in the area close to the starting point of the stream, with the intention of creating a measure to prevent floods, floods and similar situations within the facility (Photo 12).



Photos 12: View from the Filling Dam Built on the Seasonal Stream Passing through the Facility

by water from the mountains because of erosion caused by rain, especially during seasonal flows. comes with It also holds other materials (soil, stone, plants, etc.) and prevents them from coming into the facility (Photo 13).



Photos 13: View from Behind the Anti-Efill Dam Built on the Seasonal Stream Passing through the Facility

1.7 Biodiversity Risk Evaluation

1.7.1 Flora

Guidance in terms of floristics at the KIZILDERE-I GPP facility site Considering the Note 6 criteria when taken C.R. And MOST in status herb taxon available because it is not IFC No critical species and habitat assessment has been made within the scope of this study.

There are hilly areas along the borders of the facility that may be affected by surface flows, and terracing works to be carried out in these areas will allow the formation of a more stable vegetation cover both inside and outside the facility. It is important for this area to carry out such applications on sloping areas within the facility, which will slow down the surface flow rate due to excessive rainfall .

The same applies to seasonally flowing dry stream beds. With the rehabilitation works to be carried out in dry stream beds, mud, stone and silt accumulations will be better drained. will be done.

However, sloping areas that do not have a stable soil structure along the borders of the facility These are areas open to material drift after high rainfall. Carrying out terracing works here will provide the opportunity for a more stable vegetation structure to be formed both in these areas and in the areas within the facility where drift will continue.

At the same time, the rehabilitation of dry stream beds with seasonal flow is an important criterion for environmental cleaning.

Intensive surface runoff in habitats increases the risk of spread of invasive species. For this reason organised One tracing system with invader type of the risk spread control under should be kept.

➤ 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 legislative proposal within the framework of an EU Directive on IAS, addressing the issues of preventing their introduction, early warning/rapid response and effective and coordinated management. forward It lasted. A range of services with IUCN, EC In cooperation with the convention and 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.

of the project effect in the field invader flora types detection has been (Table 2). biodiversity
Action The 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. Some of the plant species used here Their ability 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, in order 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 2: Project in the field Found And Availability Possibility of The one which Invader Species

<i>Acer negundo</i> (ash tree leafy maple) andropogenic areas susceptible to influence	
<i>agropyron repens</i> (Separate herb) Field, open area	

<i>Ailanthus altissima</i> (Kokarağaç) andropogenic to the effect open spaces		
<i>Amaranthus retroflexus</i> (Fox dry) Field, open area		
<i>Boreava orientalis</i> (Sariat) Field, roadside		
<i>Chenopodium album</i> (While crying) Flood, flood bearings		
<i>Cirsium arvense</i> (Köygöçüren) Flood, flood bearings		

conyza canadensis (cypress) andropogenic to the effect open fields



conyza bonariensis (Coyote) andropogenic to the effect open fields



conyza albida (Maplewort) andropogenic to the effect open spaces



Cuscuta campestris (Turkish) meadow-pasture habitats



Lepidium draba (Diġnik) andropogenic to the effect open spaces



Ranunculus officinale (Suteresi) streamside



Reseda lutea (Love flower) Path edge, field



Rumex acetocella (Sorrel) Path edge, field And barren places



<i>Senecio vernalis</i> (Canary herb) Path edge And person Fields shaped by the influence		
<i>Sicyos angulatus</i> (Itdolanbacı) humid areas		
<i>Solanum americanum</i> (Push grape) This edge And damp shady places		
<i>portulaca oleracea</i> (Purslane) Field, open area		
<i>phytolacca americana</i> (Candymaker's paint) Stream beds and moist habitats		

Paspalum distichum (This discrete) This communities inside on channels



Robinia pseudoacacia (White flowering liar acacia) roadsides



Xanthium strumarium (Big Pitarak) Flood, flood bearings



Xanthium spinosum (Yellow Pitarak) Flood, flood bearings



Viscum album (Lime herb) to the trees interference



1.7.2 Fauna

Since there is no energy production in the Kızıldere 1 area, there is less activity and human impact in this area. Accordingly, it was observed that the fences surrounding this area were old, rusty and some areas were opened. It is deemed necessary to renew the fences of the Kızıldere 1 area with plastic-coated or painted cage wires. When fencing the area, barbed wires that may harm wild animals should not be preferred. In addition, it is deemed necessary to collect the coarse garbage seen here and there and to cut and clean the dried grass seen in some parts of the area. As a matter of fact, it was observed that a local fire broke out in one section caused by these dry grasses, and in another section the grass on the ground burned.

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

Tortoise (*Testudo graeca*): This species has been seen around the area. Its presence in the region has been assessed sparsely. 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.

1.7.3 Ornithology

IFC PS-6 and Guidance Taking into account the Note 6 criteria, the “critical species” evaluation and “critical habitat” evaluation were made in section 5 , and there are no Critical species in terms of birds in the region.

Many water birds have been identified in the wetlands around the facility, and 2 of these water birds are threatened on a global scale. These species are Elmabaş Patka (*Aythya ferina*) and Little Clumsy (*Anser erythropus*). Currently, the facilities will not have a major impact on the birds.

1.7.4 Hydrobiology

In the study conducted at Kızıldere I GPP facilities, no algae, zooplankton, benthic aquatic organisms or fish were encountered. However, it has been determined that there is seasonal flow in the stream beds within the facility. These flows generally occur in the spring and occur after rainfall. occurred for when the rains are over It is drying. This for this reason Any aquatic creature cannot show signs of life.

The underground water temperature used in the environment is around 100 ° C. There are no species that can be considered important in terms of biodiversity in underground geothermal water. However, in case of any possible negativity This hot water, which will mix with nature (necessary precautions have been taken against all kinds of negativities in the facility), may harm other living things around it.

1.8 Biodiversity Action plan

Kızıldere-I JES facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
KD1	Business	Fauna Conservation of Species	Project Area And surroundings	Tortoise (<i>Testudo</i> Facility Employees Should Be Provided Training About <i>Graeca</i>) Species. Pay Attention to Certain Points of the Project Area Tortoise 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
KD2	Business	Fauna Conservation of Species	Project Area And surroundings	Tortoise (<i>Testudo</i> Facility Employees Should Be Provided Training About <i>Graeca</i>) Species. Pay Attention to Certain Points of the Project Area Tortoise 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
KD3	Business	Fauna Conservation of Species	Project Area And surroundings	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 Give to Animals It is necessary.	Company By	During Operation	Continually
KD4	Business	Fauna Conservation of Species	Project Area And surroundings	around you fences Must be renewed And Barbed Wires Should Be Removed.	Company By	During Operation	2023 May

Kızıldere-I JES facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
KD5	Business	Fauna Conservation of Species	Project Area And surroundings	Pet Cats Should Never Be Kept 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
KD6	All Habitats	Invader Blocking Species	Project Area And surroundings	Investigation of Invasive Species Found in the Project Area and Surroundings Project Area And Around by watching Dismantling Plan Must Be Prepared	Population by Expert Biologists Level Monitoring	During Operation	one Year Duration in July and August
KD7	Business	Live Species Conservation	E2, H5 Habitats	Inclined In the fields Terracing Activities Need to Be Done	In the Coordination of Biologists Expert on the Subject By Company	During Operation	2022 December
KD8	Business	Stream Protection of Beds	E2, H5 Habitats	Stone And Pouring concretes With Creek of your bed stable Making It is necessary.	Biologists who are experts on the subject In coordination By Company	During Operation	one Year Duration: July In August
KD9	Business	Fish Conservation of Species	Project Area	Some Fish Species Have Long Distance and Some Have Short Distance Distance Migration They are the species that can . Particularly Gene Diversity of Fish Not shrinking Construction of Fish Passage for It is important.	In the Coordination of Biologists Expert on the Subject By Company	During Operation	2023 May-August

Kızıldere-I JES facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
KD10	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
KD11	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

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	

KIZILDERE –II-III JES FACILITIES BIODIVERSITY ACTION PLAN

1.1 Introduction

The Kızıldere 2 and 3 Geothermal Power Plants (GPP) are located in the Sarayköy district of Denizli. Operated by Zorlu Doğal Elektrik Üretimi A.Ş., a subsidiary of Zorlu Enerji, the plant has an installed capacity of over 160 MWe, making it the largest energy plant in Turkey. The average electricity production of the Kızıldere (Zorlu) GPP is sufficient to meet the daily electricity needs of a significant portion of the population, including residential, industrial, metro transportation, government buildings, and public lighting. When considering only residential electricity consumption, Kızıldere (Zorlu) GPP can produce enough electricity to meet the needs of over 25,000 households.

Within the boundaries of the Kızıldere II and III GPP sites lies Sarayköy village. The project site is approximately 1.5 km from Buharkent village, 7.2 km from Buldan village, and 9.3 km from Yayla village in a straight line. Additionally, important centers such as Denizli (14.5 km), Pamukkale (17 km), and Nazilli (37 km) are located within a straight line distance from the project site (Figures 3-5, 9-10).

Significant water bodies are located around the Kızıldere II and III GPP facilities. Afşar Dam is approximately 30 km, Derbent Dam is 17 km, Adıgüzel Dam is 32.5 km, Kemer Dam is 47.5 km, Salda Lake is 74 km, and Acıgöl Lake is 70 km away from the project site in a straight line (Figures 5, 11).



Figure 1: Satellite Image of the Kızıldere-II GPP Project Site

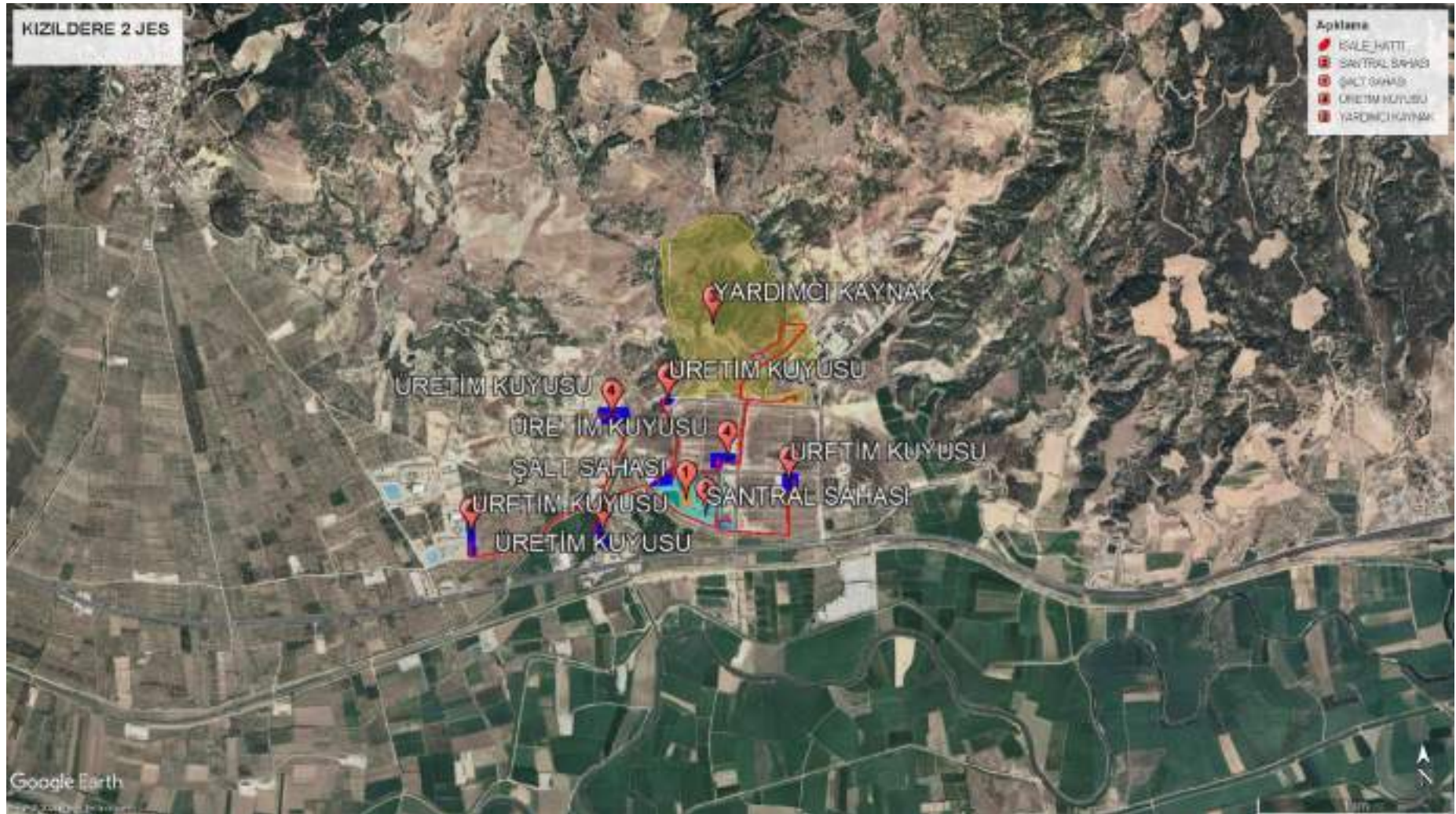


Figure 2: Satellite Image of the Kızıldere-II GPP Project Site

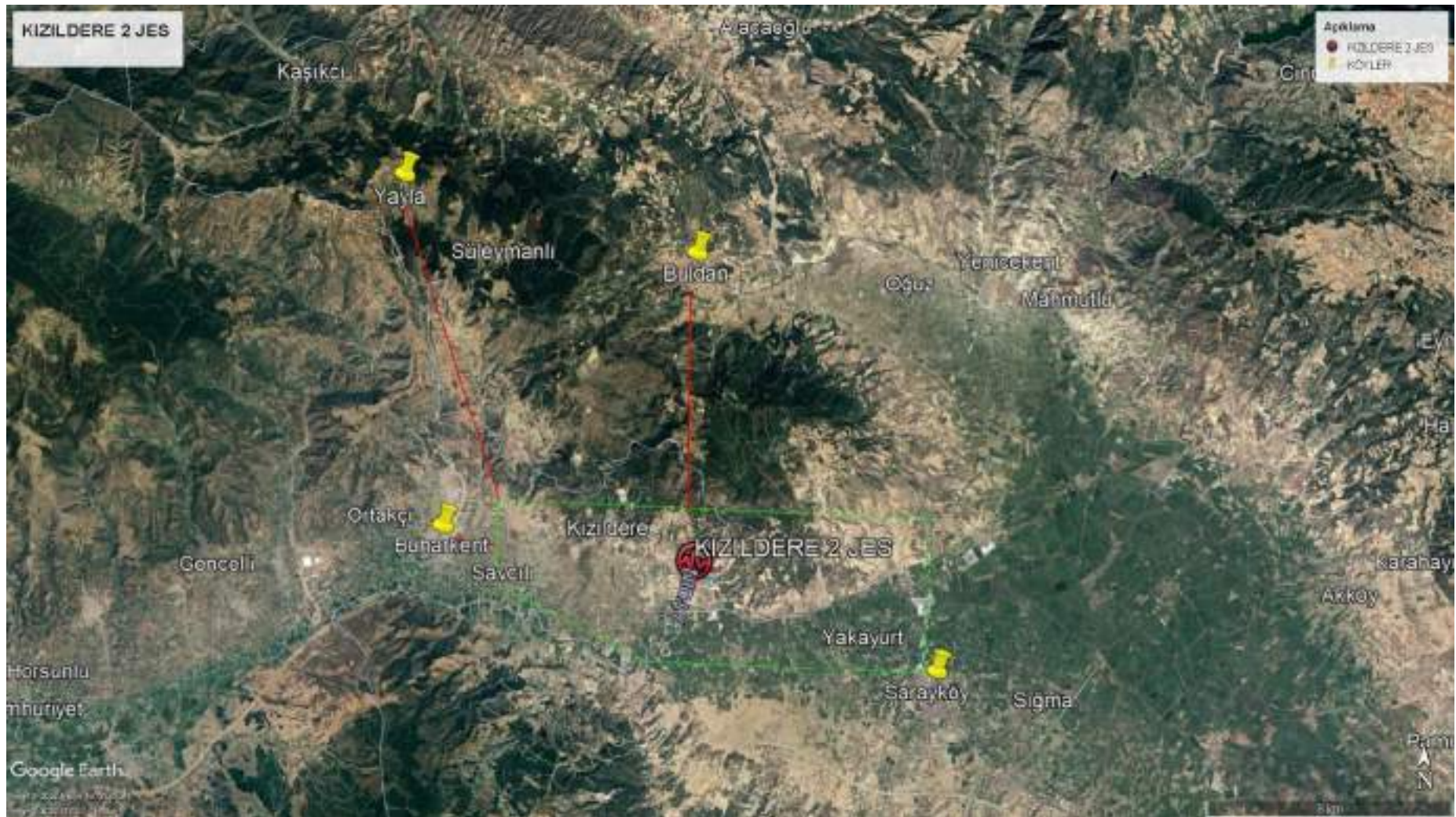


Figure 3: Villages (Neighborhoods) in the Vicinity of the Kızıldere-II GPP



Figure 4: Settlements Near the Kızıldere-II GPP Project Site

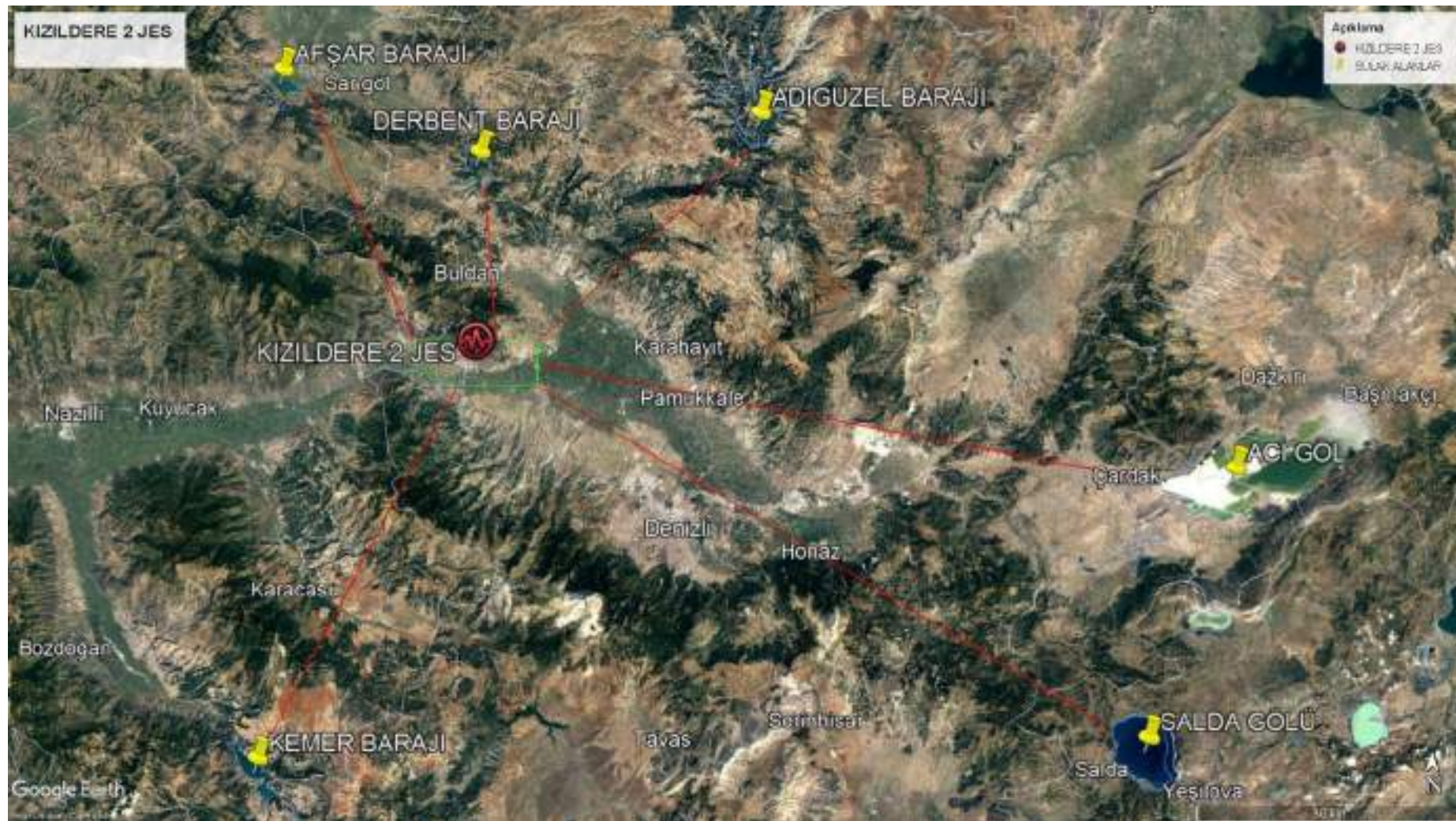


Figure 5: Significant Water Bodies Surrounding the Kızildere-II GPP Project Site



Figure 6: Satellite Image of the Kizildere-III GPP Project Site

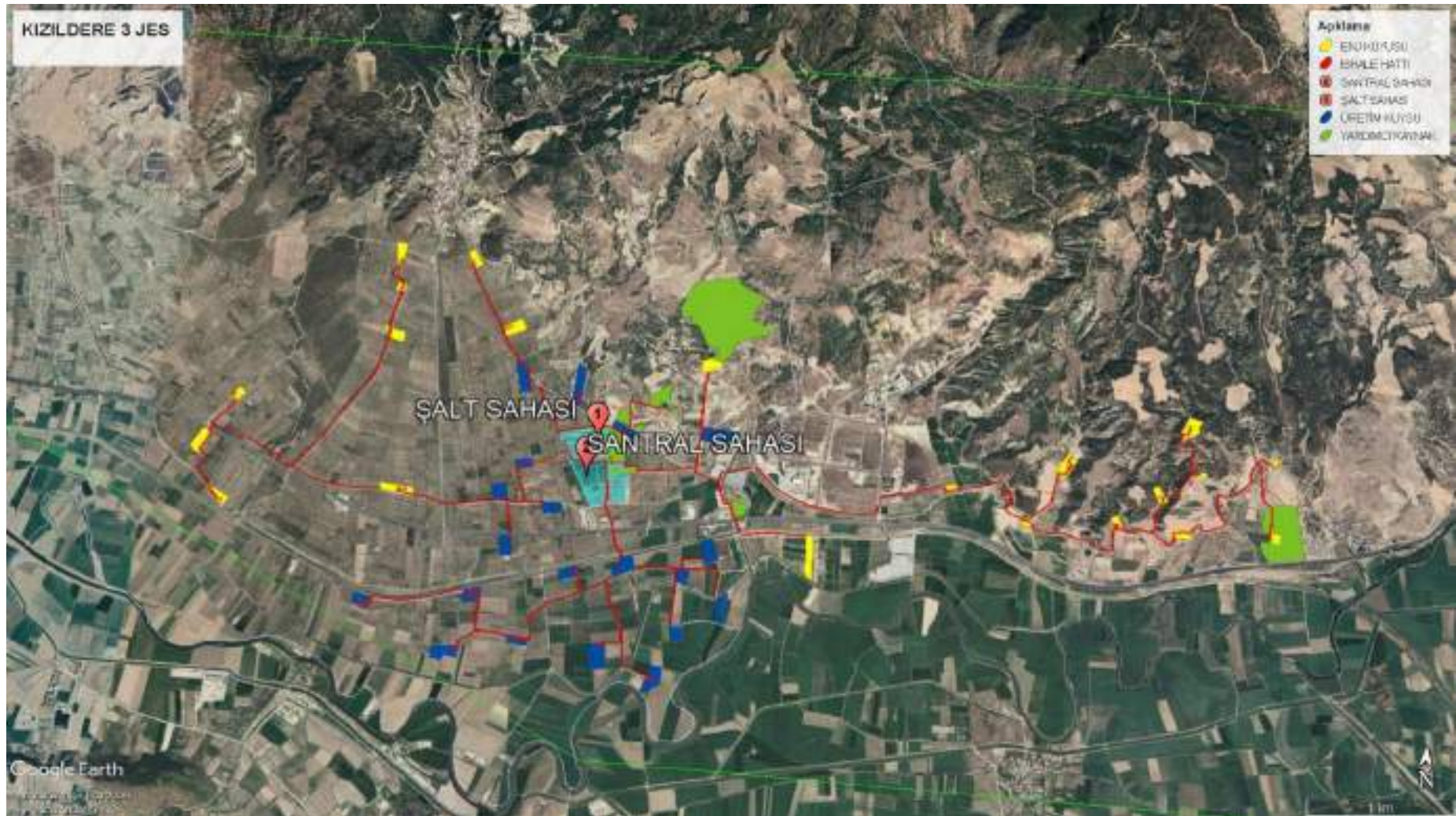


Figure 7: Satellite Image of the Kızildere-III GPP Project Site

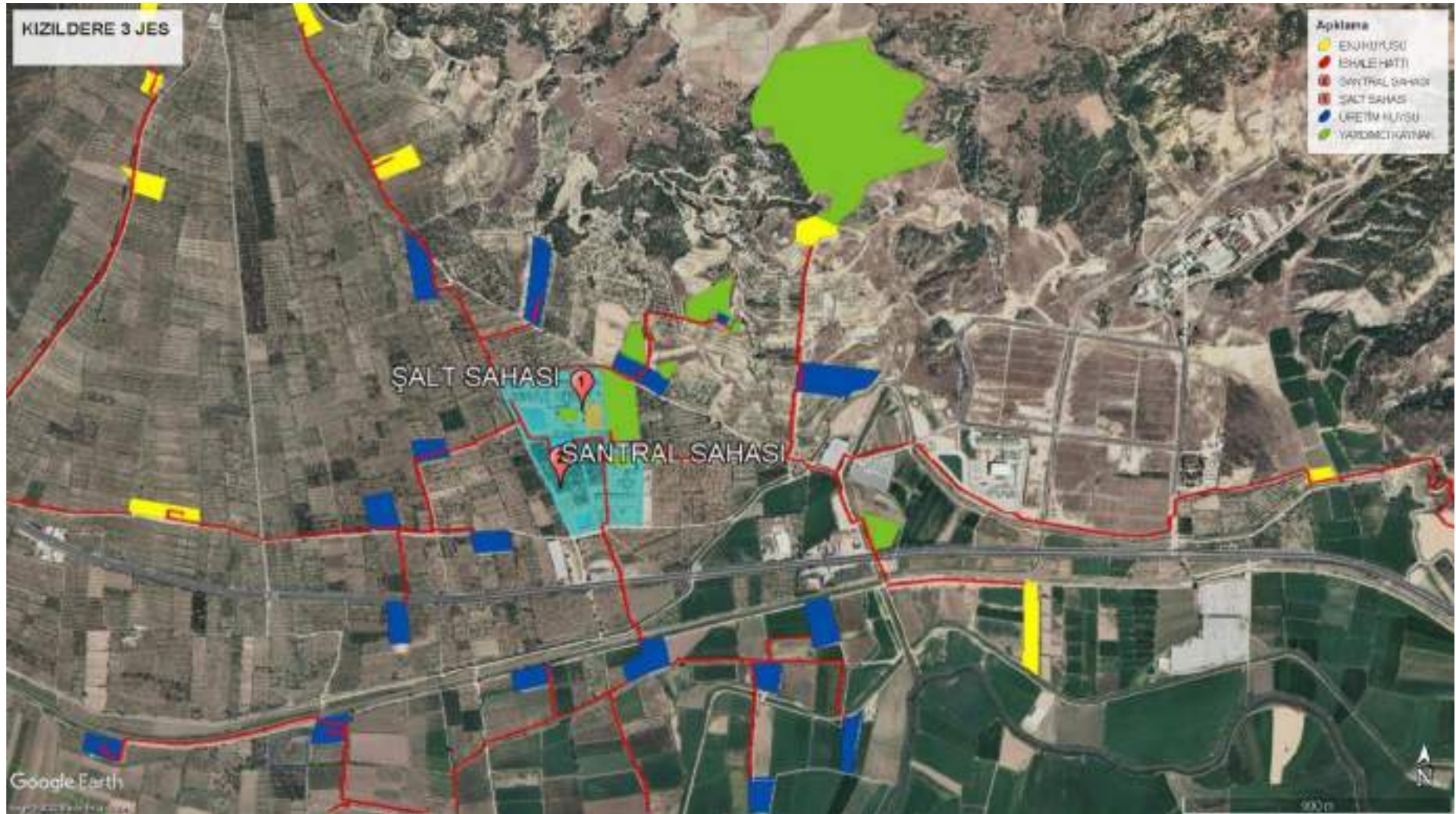


Figure 8: Satellite Image of the Kızıldere-III GPP Project Site



Figure 9: Villages (Neighborhoods) in the Vicinity of the Kızıldere-III GPP



Figure 10: Settlements Near the Kizildere-III GPP Project Site



Figure 11: Significant Water Bodies Surrounding the Kızıldere-III GPP Project Site

1.2 Relationship of the Area with Protected and Special Status Areas

Given the location of the Kızıldere II-III Geothermal Power Plant (GPP) sites, an evaluation of the nearby protected areas and important natural sites reveals that Honaz Mountain National Park is approximately 32 km away and the Honaz Mountain (small area) is about 33 km away in a straight line from the project site. Additionally, Bozdağlar is located about 29 km away, Akdağ-Denizli is 1.5 km away, and the Honaz Mountain Important Natural Area is approximately 32 km away in a straight line (Figures 12-13, 14-15).



Figure 12: Satellite Image Showing the Relationship Between Kızıldere-II GPP and Protected Areas



Figure 13: Satellite Image Showing the Relationship Between Kızıldere-II GPP and Protected Areas



Figure 14: Satellite Image Showing the Relationship Between Kızıldere-III GPP and Protected Areas



Figure 15: Satellite Image Showing the Relationship Between Kızıldere-III GPP and Protected Areas

1.3 Identification and Classification of Habitats in the Impact Area of the Kızıldere-II-III Geothermal Power Plant Facility

The Kızıldere-II-III Geothermal Power Plant (GPP) project, operated by Zorlu Doğal Elektrik Üretimi A.Ş., is located within the borders of Sarayköy district in Denizli province.

There are 13 different habitat types within the project area. Of these habitats, 4 are natural, while the remaining 9 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, as detailed below (Figures 16, 17).

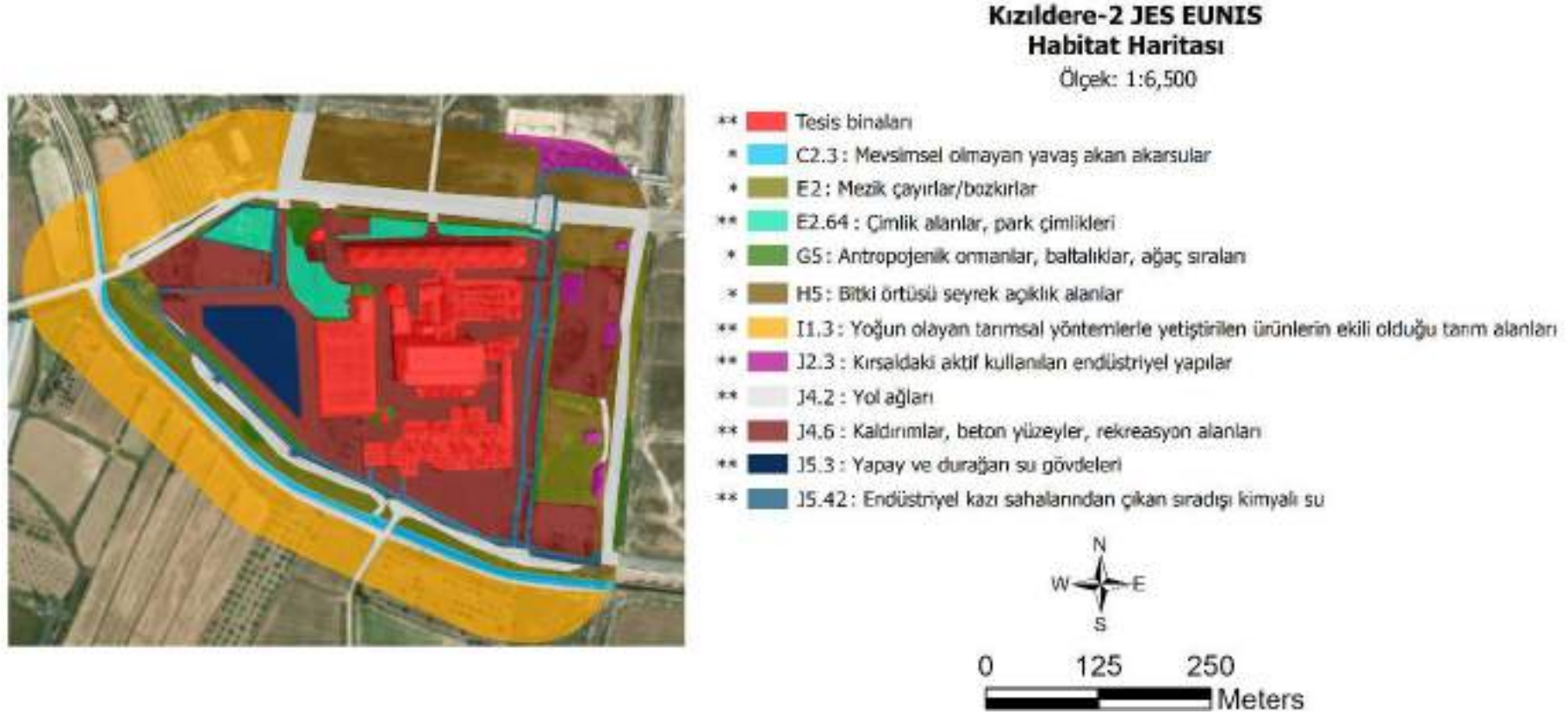


Figure 16: Kızıldere-II GPP EUNIS Habitat Map 1



**KIZILDERE III JES
EUNIS HABİTAT HARİTASI**
Ölçek: 1/6,000



0 125 250
Meters

- E2.64 : Çimlik alanlar, park çimlikleri
- G5 : Antropojenik ormanlar, baltalıklar, ağaç hatları
- H5 : Bitki örtüsü seyrek açık alanlar
- I1.3 : Yoğun olmayan tarımsal yöntemlerle yetiştirilen ürünlerin ekili olduğu tarım alanları
- J2.3 : Kırsalda aktif kullanılan endüstriyel yapılar
- J4.2 : Yol eğlen
- J4.6 : Kaldırımlar, beton yüzeyler, rekreasyon alanları
- J5.43 : İnsan yapımı yeraltı tatlı su kanalları
- J5.42 : Endüstriyel kazı saalarından çıkan sıra dışı kimyasal sular
- J6.1 : Bina yıkım ve inşaat atıklarının depolandığı alanlar
- Tesis binaları

Figure 17: Kızıldere-III GPP EUNIS Habitat Map 1

➤ **Natural habitats**

C2.3 Seasonal Non Slow Flowing streams

In this habitat located at an altitude of 150 m within the facility; *inula viscosa* , *Phragmites australis* , *tamarix tetrandra* , *Juncus acutus* Species such as have been observed.

E2 Mezik meadows

In this habitat observed at an altitude of 180 m within the facility area; *Barbarea plantaginea* , *Oenothera glazioviana* , *Inula aucherana* , *Gnaphalium luteo-album subsp.leuto -album* , *Conyza canadensis* , *Cirsium creticum subsp. creticum* , *Centaurea hierapolitana* , *Periploca graeca* there is. *graeca* , *Myosotis sylvatica subsp.cyanea* , *Prunella vulgaris*, *Euphorbia falcata subsp.macrostegia* , *Galium rivale* plant taxa were identified.

G5 anthropogenic Forests, coppice Forests

In the habitat that starts within the 250 m facility area and continues outside; *genista acanthoclada* ; *Pinus Nigra subsp . nigra var. caramanica* , *Alyssum sibiricum* , *Cistus laurifolius* , *Vicia cuspidata* , *Lathyrus digitatus* , *Dorycnium pentaphyllum subsp.anatolicum* , *Bunium ferulaceum* , *Helichrysum plicatum subsp.plicatum* , *Cirsium vulgare* , *Centaurea solstitialis subsp.solstitialis* , *Xeranthemum inapertum* , *Crepis foetida subsp . commutata* , *Jasminum fruticans* , *Onosma aucheranum* , *Scrophularia floribunda* , *Veronica cymbalaria* , *Veronica triloba* , *Scutellaria orientalis subsp.alpina var. glandulosissima* , *Origanum sipyleum* , *Salvia frigida* , *plantago major subsp . intermedia* , *Viscum album subsp . austriacum* , *Allium atroviolaceum* There are plant taxa.

H5 Herb Cover Rare Clearance Areas

The facility is at an altitude of 230 m; *consolida regalis subsp.paniculata var. paniculata* , *Isatis glauca subsp . glauca* , *Alyssum dasycarpum var. dasycarpum* , *Fumana procumbens* , *Gypsophila perfoliata var. perfoliata* , *Atriplex rosea* , *Linum tenuifolium* , *Peganum harmala* , *Haplophyllum buxbaumii subsp . buxbaumii* , *Echinophora tournefortii* , *Bunium ferulaceum* , *Anthemis cretica subsp. tenuiloba* , *Achillea biebersteinii* , *Jurinea consanguinea* , *Carthamus dentatus* , *Tragopogon latifolius var. latifolius* , *Crepis foetida subsp . commutata* , *Marrubium parviflorum subsp . parviflorum* , *Ecballium elaterium* , plant taxa have been identified.

➤ modified habitats

J2.1, J2.3, Areas with habitat codes J4.2, J5.42, J6.1 are concrete, chemical water and asphalt and do not have floral content. However, cleaning the seeds that germinate in the cracks in these structures is important for the integrity of the system. Care should be taken to ensure that the plants used for landscaping and food purposes in the habitat coded E2.64 and J4.6 are not invasive species .



Photos one in the countryside Active Used Industrial Buildings (EUNIS: J2.3)



Photos 2 Path networks With sidewalks And Recreation Fields (EUNIS: J4.2 And J4.6)



Photos 3 Person making Salty Non This channels (EUNIS: J5.41)



Photos 4 lawn fields, Park lawns (EUNIS: E2.64)

1.2	Identification of Floristic Biodiversity in the	Impact	Area of	Kızıldere-II-
	III GPP	Facility		

When we look at the vegetation structure of the Kızıldere III GPP site; Most of them are areas with orchards shaped by human influence. In Kızıldere II GPP , this situation is in the form of open areas with sparse vegetation.

IFC PS-6 and Guidance in terms of floristics at the KIZILDERE-II -III GPP facility site Considering the Note 6 criteria, since there are no plant taxa with CR and EN status, critical species and habitat assessments were not made within the scope of IFC. Therefore, there is no critical habitat hosting these taxa. Apart from the coppice tree communities whose cover has been broken by human influence, there are reeds, reeds and tamarisks in the non-seasonal, slow-flowing stream beds .

1.3 Kızıldere-II-III JES facility Effect in the field faunistic Defining Biodiversity

1.3.1 Amphibian

There is no endangered and/or endemic amphibian species in the project area. located in the area amphibian types widespread species. Project in the field amphibians in terms of One immortality and the precautions to be taken are not foreseen. On the contrary, during the transportation of project-sourced water to some areas, water leaking into the ground at some points creates suitable spots for amphibians .

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.

1.3.2 Reptiles

The only reptile species in the project area that is vulnerable to extinction according to IUCN lists 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. Also in the region is the **Anatolian lizard (*Anatololacerta*)**, a largely endemic lizard. ***anatolicus***) is distributed. This species has a wide distribution from the Büyük Menderes River northward to the Marmara Region. The IUCN category is LC .

There are no reptile species that are likely to be directly affected by the project. The facilities have been operating in the region for many years. Although there may be species affected by the project during the construction phase, the facilities do not emit any emissions such as noise, dust, or polluted air into the environment during the current operation phase.

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

Criterion 1: Refers to Critically Endangered (CR) and /or Endangered (EN) Species. 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. It refers to Endemic and/or Narrowly Ranged Species. It refers to Endemic and/or Narrowly Ranged Species. **Anatolian lizard (*Anatololacerta*)**, which is endemic to the project site ***anatolicus***) is distributed. The distribution area of this endemic species is more than 50,000 square kilometers (km²). is too much. Project area This your species spherical population the size of $\geq 10\%$ And One your species reproductive of unit

It is not possible to say that there is an area that regularly hosts ≥ 10 of them. This According to the available information, the project site **does not meet the threshold value for Criterion 2.**

Criterion 3: Immigrant and/or Community In case of condensing Types expression It does. **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 .**

1.3.3 Mammals

in the region generation in danger and/or endemic One mammal There is no type .

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 features such as these 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 areas 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 connection also extends across elevation and climate gradients and across crest-to- coast to coast)” also includes biological corridors.

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 Kızıldere-II-III GPP Facility 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 a large number of critical and/or endemic species. In this regard, the area **does not meet** Criterion 5.

1.3.4 Ornithology

As a result of the studies, a total of 151 bird species were identified in the project area and its immediate surroundings. The list of these species, their global Red List status, and the status of the species in BERN, CITES and MAK decisions of 2022 are given in Table 1 below.

Facility around found bird from types 3 of grain generation spherical on scale threatening is below. These species are Elmabaş Patka (*Aythya ferina*), Küçük Sakarca (*Anser erythropus*) and stepmother (*Streptopelia turtur*) species, and the most current Red List assessments of all of these species are in the “VU” category, that is, sensitive (IUCN, 2022). Of the species found around the facilities, 102 are in BERN Agreement Annex-2, 39 are in BERN Agreement Annex-3, 1 of them is included in CITES Annex-1 and 13 of them are included in CITES Annex-2.

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

Habitats Important to Critically Endangered (CR) or Endangered (EN) Species

No “CR” or “EN” category bird species were detected around the facilities. Therefore, this criterion is not triggered.

Criterion 2: endemic And Narrow widespread Species For Important Habitats

Facility birds around This criterion It does not trigger.

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

The Kızıldere-II-III GPP Facility does 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 one Project in the field Found And Finding Likely Bird Types

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Accipiter nisus</i>	Eurasian Sparrowhawk	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Acrocephalus arundinaceus</i>	Great Reed Warbler	Not Endemic	LC	Annex 2	KD	KD
<i>Acrocephalus melanopogon</i>	Moustached Warbler	Not Endemic	LC	Annex 2	KD	KD
<i>Acrocephalus schoenobaenus</i>	Sedge Warbler	Not Endemic	LC	Annex 2	KD	KD
<i>Acrocephalus scirpaceus</i>	Eurasian Reed Warbler	Not Endemic	LC	Annex 2	KD	KD
<i>Actitis hypoleucos</i>	Common Sandpiper	Not Endemic	LC	Annex 2	KD	KD
<i>Alauda arvensis</i>	Eurasian Skylark	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Alcedo atthis</i>	Common Kingfisher	Not Endemic	LC	Annex 2	KD	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
<i>Anas platyrhynchos</i>	Mallard	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Anser albifrons</i>	Greater White-fronted Goose	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Anser erythropus</i>	Lesser White-fronted Goose	Not Endemic	VU	Annex 2	KD	KD
<i>Anthus cervinus</i>	Red-throated Pipit	Not Endemic	LC	KD	KD	KD
<i>Anthus pratensis</i>	Meadow Pipit	Not Endemic	LC	Annex 2	KD	KD
<i>Anthus spinoletta</i>	Water Pipit	Not Endemic	LC	Annex 2	KD	KD
<i>Apus apus</i>	Common Swift	Not Endemic	LC	Annex 3	KD	KD
<i>Apus melba</i>	Alpine Swift	Not Endemic	LC	Annex 2	KD	KD
<i>Ardea alba</i>	Great Egret	Not Endemic	LC	Annex 2	KD	KD
<i>Ardea cinerea</i>	Grey Heron	Not Endemic	LC	Annex 3	Annex 1	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>Athene noctua</i>	Little Owl	Not Endemic	LC	Annex 2	KD	Annex 2

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Aythya ferina</i>	Common Pochard	Not Endemic	VU	Annex 3	Annex 2	KD
<i>Aythya nyroca</i>	Ferruginous Duck	Not Endemic	NT	Annex 3	KD	KD
<i>Botaurus stellaris</i>	Great Bittern	Not Endemic	LC	Annex 2	KD	KD
<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>Calidris alba</i>	Sanderling	Not Endemic	LC	Annex 2	KD	KD
<i>Calidris alpina</i>	Dunlin	Not Endemic	LC	Annex 2	KD	KD
<i>Calidris minuta</i>	Little Stint	Not Endemic	LC	Annex 2	KD	KD
<i>Calidris pugnax</i>	Ruff	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Carduelis carduelis</i>	European Goldfinch	Not Endemic	LC	Annex 2	KD	KD
<i>Cecropis daurica</i>	Red-rumped Swallow	Not Endemic	LC	Annex 2	KD	KD
<i>Cettia cetti</i>	Cetti's Warbler	Not Endemic	LC	Annex 2	KD	KD
<i>Charadrius alexandrinus</i>	Kentish Plover	Not Endemic	LC	Annex 2	KD	KD
<i>Charadrius dubius</i>	Little Ringed Plover	Not Endemic	LC	Annex 2	KD	KD
<i>Charadrius hiaticula</i>	Common Ringed Plover	Not Endemic	LC	Annex 2	KD	KD
<i>Chlidonias hybrida</i>	Whiskered Tern	Not Endemic	LC	Annex 2	KD	KD
<i>Chlidonias leucopterus</i>	White-winged Tern	Not Endemic	LC	Annex 2	KD	KD
<i>Chloris chloris</i>	European Greenfinch	Not Endemic	LC	Annex 2	KD	KD
<i>Chroicocephalus ridibundus</i>	Black-headed Gull	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Ciconia ciconia</i>	White Stork	Not Endemic	LC	Annex 2	KD	KD
<i>Ciconia nigra</i>	Black Stork	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Circaetus gallicus</i>	Short-toed Snake Eagle	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Circus aeruginosus</i>	Western Marsh Harrier	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Circus cyaneus</i>	Northern Harrier	Not Endemic	LC	Annex 2	KD	Annex 2

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Cisticola juncidis</i>	Zitting Cisticola	Not Endemic	LC	KD	KD	KD
<i>Clamator glandarius</i>	Great Spotted Cuckoo	Not Endemic	LC	Annex 2	KD	KD
<i>Columba livia</i>	Rock Dove	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Columba palumbus</i>	Common Wood Pigeon	Not Endemic	LC	KD	Annex 2	KD
<i>Coracias garrulus</i>	European Roller	Not Endemic	LC	Annex 2	KD	KD
<i>Corvus corax</i>	Common Raven	Not Endemic	LC	Annex 3	Annex 1	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>Curruca melanocephala</i>	Sardinian Warbler	Not Endemic	LC	Annex 2	KD	KD
<i>Cyanistes caeruleus</i>	Eurasian Blue Tit	Not Endemic	LC	Annex 2	KD	KD
<i>Cygnus columbianus</i>	Tundra Swan	Not Endemic	LC	KD	KD	KD
<i>Delichon urbicum</i>	Common House Martin	Not Endemic	LC	Annex 2	KD	KD
<i>Dendrocopos syriacus</i>	Syrian Woodpecker	Not Endemic	LC	Annex 2	KD	KD
<i>Egretta garzetta</i>	Little Egret	Not Endemic	LC	Annex 2	KD	KD
<i>Emberiza caesia</i>	Cretzschmar's Bunting	Not Endemic	LC	Annex 2	KD	KD
<i>Emberiza calandra</i>	Corn Bunting	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Emberiza cirrus</i>	Cirl Bunting	Not Endemic	LC	Annex 2	KD	KD
<i>Emberiza citrinella</i>	Yellowhammer	Not Endemic	LC	Annex 2	KD	KD
<i>Emberiza melanocephala</i>	Black-headed Bunting	Not Endemic	LC	Annex 2	KD	KD
<i>Emberiza schoeniclus</i>	Common Reed Bunting	Not Endemic	LC	Annex 2	KD	KD
<i>Erithacus rubecula</i>	European Robin	Not Endemic	LC	Annex 2	KD	KD
<i>Falco columbarius</i>	Merlin	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Falco eleonora</i>	Eleonora's Falcon	Not Endemic	LC	Annex 2	KD	Annex 2

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Falco peregrinus</i>	Peregrine Falcon	Not Endemic	LC	Annex 2	KD	Annex 1
<i>Falco tinnunculus</i>	Common Kestrel	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Ficedula hypoleuca</i>	Pied Flycatcher	Not Endemic	LC	Annex 2	KD	KD
<i>Fringilla coelebs</i>	Common Chaffinch	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Fulica atra</i>	Eurasian Coot	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Galerida cristata</i>	Crested Lark	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Gallinago gallinago</i>	Common Snipe	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Gallinula chloropus</i>	Common Moorhen	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Garrulus glandarius</i>	Eurasian Jay	Not Endemic	LC	KD	Annex 2	KD
<i>Gelochelidon nilotica</i>	Gull-billed Tern	Not Endemic	LC	Annex 2	KD	KD
<i>Himantopus himantopus</i>	Black-winged Stilt	Not Endemic	LC	Annex 2	KD	KD
<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>Ixobrychus minutus</i>	Little Bittern	Not Endemic	LC	Annex 2	KD	KD
<i>Lanius collurio</i>	Red-backed Shrike	Not Endemic	LC	Annex 2	Annex 1	KD
<i>Lanius minor</i>	Lesser Grey Shrike	Not Endemic	LC	Annex 2	KD	KD
<i>Lanius senator</i>	Woodchat Shrike	Not Endemic	LC	Annex 2	KD	KD
<i>Linaria cannabina</i>	Common Linnet	Not Endemic	LC	Annex 2	KD	KD
<i>Lullula arborea</i>	Woodlark	Not Endemic	LC	Annex 3	Annex 1	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>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>Motacilla alba</i>	White Wagtail	Not Endemic	LC	Annex 2	KD	KD

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Motacilla cinerea</i>	Grey 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>Netta rufina</i>	Red-crested Pochard	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Oenanthe finschii</i>	Finsch's Wheatear	Not Endemic	LC	Annex 2	KD	KD
<i>Oenanthe isabellina</i>	Isabelline Wheatear	Not Endemic	LC	Annex 2	Annex 1	KD
<i>Oenanthe melanoleuca</i>	Eastern Black-eared Wheatear	Not Endemic	LC	Annex 2	KD	KD
<i>Oenanthe oenanthe</i>	Northern Wheatear	Not Endemic	LC	Annex 2	Annex 1	KD
<i>Parus major</i>	Great Tit	Not Endemic	LC	Annex 2	KD	KD
<i>Passer domesticus</i>	House Sparrow	Not Endemic	LC	KD	Annex 2	KD
<i>Passer hispaniolensis</i>	Spanish Sparrow	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Passer montanus</i>	Eurasian Tree Sparrow	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Petronia petronia</i>	Rock Sparrow	Not Endemic	LC	Annex 2	KD	KD
<i>Phalacrocorax carbo</i>	Great Cormorant	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Phoenicopterus roseus</i>	Greater Flamingo	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Phoenicurus ochrurus</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>Pica pica</i>	Eurasian Magpie	Not Endemic	LC	Annex 2	KD	KD
<i>Platalea leucorodia</i>	Eurasian Spoonbill	Not Endemic	LC	Annex 2	KD	KD
<i>Plegadis falcinellus</i>	Glossy Ibis	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>Rallus aquaticus</i>	Water Rail	Not Endemic	LC	Annex 3	Annex 1	KD

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Recurvirostra avosetta</i>	Pied Avocet	Not Endemic	LC	Annex 2	KD	KD
<i>Regulus regulus</i>	Goldcrest	Not Endemic	LC	Annex 2	KD	KD
<i>Remiz pendulinus</i>	Eurasian Penduline Tit	Not Endemic	LC	Annex 3	KD	KD
<i>Saxicola rubetra</i>	Whinchat	Not Endemic	LC	Annex 2	KD	KD
<i>Saxicola rubicola</i>	Common Stonechat	Not Endemic	LC	Annex 2	KD	KD
<i>Serinus serinus</i>	European Serin	Not Endemic	LC	Annex 2	KD	KD
<i>Sitta neumayer</i>	Rock Nuthatch	Not Endemic	LC	Annex 2	KD	KD
<i>Spatula clypeata</i>	Northern Shoveler	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Spatula querquedula</i>	Garganey	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Streptopelia decaocto</i>	Eurasian Collared Dove	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Streptopelia senegalensis</i>	Laughing Dove	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Streptopelia turtur</i>	European Turtle Dove	Not Endemic	VU	Annex 3	Annex 2	KD
<i>Sturnus vulgaris</i>	Common Starling	Not Endemic	LC	KD	Annex 1	KD
<i>Sylvia atricapilla</i>	Eurasian Blackcap	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>Tadorna tadorna</i>	Common Shelduck	Not Endemic	LC	Annex 2	KD	KD
<i>Tringa erythropus</i>	Spotted Redshank	Not Endemic	LC	Annex 2	KD	KD
<i>Tringa glareola</i>	Wood Sandpiper	Not Endemic	LC	Annex 2	KD	KD
<i>Tringa nebularia</i>	Common Greenshank	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Tringa ochropus</i>	Green Sandpiper	Not Endemic	LC	Annex 2	KD	KD
<i>Tringa stagnatilis</i>	Marsh Sandpiper	Not Endemic	LC	Annex 2	KD	KD
<i>Tringa totanus</i>	Common Redshank	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Troglodytes troglodytes</i>	Eurasian Wren	Not Endemic	LC	Annex 2	KD	KD

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Turdus merula</i>	Common Blackbird	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Turdus philomelos</i>	Song Thrush	Not Endemic	LC	Annex 3	Annex 2	KD
<i>Turdus viscivorus</i>	Mistle Thrush	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Tyto alba</i>	Barn Owl	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Upupa epops</i>	Eurasian Hoopoe	Not Endemic	LC	Annex 2	KD	KD
<i>Vanellus spinosus</i>	Spur-winged Lapwing	Not Endemic	LC	Annex 2	KD	KD
<i>Vanellus vanellus</i>	Northern Lapwing	Not Endemic	NT	Annex 3	Annex 1	KD
<i>Zapornia parva</i>	Little Crane	Not Endemic	LC	Annex 2	KD	KD

1.4 Kızıldere-II-III JES facility Effect in the field hydrobiological biodiversity

Definition

In the study conducted at Kızıldere-II-III GPP Facilities, no algae, zooplankton, benthic No aquatic organisms or fish were found. However, it has been determined that there is seasonal flow in the stream beds within the facility. These flows generally occur in the spring and since they occur after rain, they dry out when the rain ends. For this reason, no aquatic creature can show signs of life.

the seasonal flow carries sediment , an embankment dam was created in the area close to the starting point of the stream, with the intention of creating a measure to prevent floods, floods and similar situations within the facility **(Photo 5)**.



Photos 5 View from the Embankment Dam Built on the Seasonal Stream Passing through the Facility

This dam set was created as a result of erosion caused by rain, especially during seasonal flows. from the mountains This with together incoming other materials also (soil, stone, herb etc.) holding It prevents them from coming into the facility (Photo 6).



Photos 6 View from Behind the Anti-Efill Dam Built on the Seasonal Stream Passing through the Facility

1.5 biodiversity Risk Evaluation

1.5.1 Flora

IFC PS-6 and Guidance in terms of floristics at the KIZILDERE-II-III GPP facility site
Considering the Note 6 criteria, since there are no plant taxa with CR and EN status, critical species and habitat assessments were not made within the scope of IFC.

➤ 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 (Table 2). biodiversity
The 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, in order 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 2 Project in the field Found And Availability Possibility of The one which Invader Species

<i>Acer negundo</i> (ash tree leafy maple) Areas open to andropogenic influence	
<i>Agropyron repens</i> (Separate herb) Field, open area	
<i>Ailanthus altissima</i> (Kokarağaç) andropogenic to the effect open spaces	
<i>Amaranthus retroflexus</i> (Fox dry) Field, open area	

Boreava orientalis (Sariat) Field, roadside



chenopodium album (While crying) Flood, flood bearings



Cirsium arvense (Köygöçüren) Flood, flood bearings



conyza canadensis (cypress) andropogenic to the effect open fields



conyza bonariensis (Coyote) andropogenic to the effect open fields



conyza albida (Maplewort) andropogenic to the effect open spaces



Cuscuta campestris (Turkish) meadow-pasture habitats



Lepidium draba (Diġnik) andropogenic to the effect open spaces



nasturtium officinale (Suteresi) streamside



Reseda lutea (Love flower) Path edge, field



Rumex acetocella (Sorrel) Path edge, field And barren places



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

Paspalum distichum (This discrete) This communities inside on channels



Robinia pseudoacacia (White flowering liar acacia) roadsides



Xanthium strumarium (Big Pitarak) Flood, flood bearings



Xanthium spinosum (Yellow Pitarak) Flood, flood bearings



Viscum album (Lime herb) to the trees interference



1.5.2 Fauna

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

Tortoise (*Testudo graeca*): This species has been seen around the area. Its presence in the region has been assessed sparsely. 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.

1.5.3 Ornithology

IFC PS-6 and Guidance Considering the Note 6 criteria, “critical type” evaluation and “critical habitat” assessment in chapter 5 made is, birds in the area in terms of There are no critical species.

Many water birds have been identified in the wetlands around the facility, and 2 of these water birds are threatened on a global scale. These species are Elmabaş Patka (*Aythya ferina*) and Little Clumsy (*Anser erythropus*). Currently, the facilities will not have a major impact on the birds.

1.5.4 Hydrobiology

In the study conducted at Kızıldere II-III GPP facilities, no algae, zooplankton, benthic aquatic organisms or fish were found. However, it has been determined that there is seasonal flow in the stream beds within the facility. These flows generally occur in the spring and rain from the rain later occurred for rains when it's over It is drying. This for this reason any An aquatic creature cannot show signs of life.

The underground water temperature used in the environment is around 100 ° C. There are no species that can be considered important in terms of biodiversity in underground geothermal water. However, in case of any possible negativity This hot water, which will mix with nature (necessary precautions have been taken against all kinds of negativities in the facility), may harm other living things around it.

1.5.5 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 ,
- weather 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 3 .

Table 3 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 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. Regarding the issue dated 26.06.2021 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	process in the scope of formed waste battery And accumulators in the scope of, Waste BatteryAnd In accordance with Article 13 of the Accumulator Control Regulation; 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.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".
		Medical Wastes	For medical waste generated within the scope of the activity; waste at the source -most member will download system establishmentof 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,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 separatelywaste 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.
		Waste Electronic Things	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.
		Waste oils	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

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 06.06.2015 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 25.2006 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.

At the facility, care should be taken to store waste scrap materials on concrete floors rather than soil.

It has been observed that the business is subject to Environmental Permits on Air Emission and Wastewater Discharge within the Scope of the Environmental Permit and License Regulation, but it has been determined that it does not have an environmental permit .

Domestic wastewater generated within the scope of the project is subjected to package treatment and discharged to the receiving environment. In this context, within the scope of domestic wastewater generated during the operation phase, the provisions of the "Water Pollution Control Regulation", which came into force after being published in the Official Gazette No. 25687 dated 31.12.2004, must be complied with. An analysis must be made by accredited companies by applying to the MELBES system of the Ministry of Environment, Urbanization and Climate Change at the package treatment outlet. In addition, the provisions of the Water Pollution Control Regulation and the Regulation on the Protection of Drinking and Domestic Water Basins must be complied with during the operation.

Emission measurements of the chimneys in the facility must be made regularly by accredited companies by applying to the MELBES system of the Ministry of Environment, Urbanization and Climate Change, within the scope of the provisions and principles specified in the Regulation on Control of Industrial Air Pollution.

This in scope urgent way Environment permission transactions It needs to be done .

1.6 Social Responsibility Suggestions

Social responsibility projects are the expression of the investor company's sensitivity to biodiversity. Starting from this point, cultivating the endemic bulbous plants in Denizli province, which are our most important resource values, will be one of the good examples of these sensitivities (Table 4)

Table 4 Kızıldere-II-III JES facility For Denizli in the province Sensitive And Rare endemic Bulbous Plant Suggestions

Herb taxon	English Name	Blooming	habitat
Allium sibthorpiatum	Fowl Onion	8- 9	calcareous Rock cracks, Cliff slopes , Cagilli Mountain pastures
Allium deciduum subsp. deciduum	Bald Onion	7- 8	Dry Rock Slopes , Stony Fields
Allium stylosum	Dillisogan	5-6	Pine and Juniper Forests, Calcareous Shrubs, Cultivated Area , Calling , Step
Ornithogalum alpigenum	Alpine Star of Bethlehem	4- 7	hills, steppes, Forest
Muscari muscarimi	Fragrant Grape Hyacinth	5-6	calling And Step And slopes
Muscari mirum	Dirmil Grape Hyacinth	5-6	Naked Rocky slopes, serpentine Rocks
Muscari aucheri	Blue Grape Hyacinth	4- 6	Rocky Slope, calcareous Calling , Mountain pastures, This puddles
Hyacinthella lineata	Mountain Hyacinth	3- 5	Oak bushes , Pine bottoms, Sandy And Rocky Overgrazed Slope
Fritillaria crassifolia subsp. crassifolia	Thick-leaved Fritillary	5-6	calcareous calling
Colchicum micaceum	Babamakhrut	8- 9	Sandy Or Rocky Mountain slopes, Snowy Places
Iris purpureobractea	Purple Bract Iris	4- 5	Cliff Places, Sometimes Cedar Or Pine forests

Crocus baytopiorum	Lady Crocus	2- 4	calcareous Callings
<i>crocus flavus</i> subsp . <i>dissectus</i>	Dilikçiğdem	3-4	grove, Bushes And lawns
<i>Epipactis tremolsii</i> subsp .	Turkbindallısı	5- 7	Dry Grassland, Pine Forest

Herb taxon	English Name	Blooming	habitat
<i>turcica</i>			clarity, Frigana , Oak bush

, the medicinal and aromatic plants mentioned in Table 5 , which have economic value, can be produced in a 50 m ² polyethylene greenhouse (turned from seed to seedling) to be established within the facility site, and a medicinal and aromatic plant garden can be established in the fields of the local people. This action, which has economic returns, will also be an approach compatible with the understanding of sustainable biodiversity . This area can be improved by adding species every year.

Table 5 Production can be done Medical And Aromatic plants

Herb taxon	English Name
Salvia officinalis	Common Sage
Echinacea purpurea	Purple Coneflower
Echinacea angustifolia	Narrow-leaved Coneflower
Origanum onites	Izmir Oregano
Thymus vulgaris	Common Thyme
Mentha piperita	Peppermint
Achillea millefolium	Yarrow
Calendula officinalis	Pot Marigold
Melissa officinalis	Lemon Balm
Lavandula angustifolia	Lavender
Rosmarinus officinalis	Rosemary
Hypericum perforatum	St John's Wort
Urtica dioica	Stinging Nettle
Helichrysum sp.	Everlasting Flower

Moreover; During April and October, local people can be trained on what can be done to spread hot water around.

1.7 biodiversity Action plan

Kızıldere- Ii - III jess facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
KZD1	Business	Fauna Conservation of Species	Project Area And surroundings	Tortoise (<i>Testudo</i> Facility Employees Should Be Provided Training About <i>Graeca</i>) Species. Pay Attention to Certain Points of the Project Area Tortoise may come out signs It must be placed.	Biologists who are experts on the subject Training Should Be Provided by	During Operation	April-May 2024 one Times
KZD2	Business	Fauna Conservation of Species	Project Area And surroundings	Tortoise (<i>Testudo</i> Facility Employees Should Be Provided Training About <i>Graeca</i>) Species. Pay Attention to Certain Points of the Project Area Tortoise may come out signs It must be placed.	Biologists who are experts on the subject Training Should Be Provided by	During Operation	April-May 2024 one Times
KZD3	Business	Fauna Conservation of Species	Project Area And surroundings	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 Give to Animals It is necessary.	Company By	During Operation	Continually

KZD4	Business	Fauna Conservation of Species	Project Area And surroundings	Pet Cats Should Never Be Keeped 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

Kızıldere- Ii - III jess facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
KZD5	All Habitats	Invader Blocking Species	Project Area And surroundings	Investigation of Invasive Species Found in the Project Area and Surroundings Project Area And Around by watching dismantling of your plan Must be prepared	Population by Expert Biologists Level Monitoring	During Operation	one Year Duration in July and August
KZD6	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
KZD7	Business	Prevention of Environmental Pollution	Project Area	Licensed in accordance with the Waste Codes for Non-Hazardous Wastes Generated within the Business Companies Recycling /Disposal by to its facilities Must be Delivered .	Company By	During Operation	per year one
KZD8	Business	Prevention of Environmental Pollution	Project Area	Business Environmental Permit and License Regulation Themed Environment permissions receiving	Company By/Environmental Officer/Environmental Consultancy Firm	During Operation	2022 December

Kızıldere- Ii - III jess facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
KZD9	Business	Prevention of Environmental Pollution	Project Area	and Principles Specified in the Regulation on the Control of Industrial Air Pollution from the Chimneys in the Facility Environment, Companies Accredited by Application from the Ministry of Urbanization and Climate Change, Melbes System By Emission Measurements Organised in the figure to be done It is necessary.	Company By/Environmental Officer/Environmental Consultancy Firm	During Operation	2 per year one
KZD10	Business	Prevention of Environmental Pollution	Project Area	and Climate Change from Package Treatment Output within the Scope of Domestic Wastewater ministry, Analysis by Accredited Companies by Applying to the Melbes System Getting it done It is necessary.	Company By/Environmental Officer/Environmental Consultancy Firm	During Operation	4 on the moon one

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</i> <i>Ayhan BATUHAN</i>	Bird observation	

ALAŞEHİR JES FACILITY BIODIVERSITY ACTION PLAN

1.1 Entrance

Zorlu Jeotermal Enerji Elektrik Üretim A.S has developed an electricity production plant utilizing geothermal energy with an installed capacity of 45 MWe in the agricultural area located in Manisa Province, Alasehir District, at the Erenköy, Osmaniye, and Çesneli Villages' location, covering a total of 39,975 m² across parcels no. 27, 28, 30, and 31 on the 1/25,000 scale topographic map, İzmir L20-b2 sheet. The Alasehir-1 Geothermal Power Plant (GPP) project includes 20 geothermal wells, with 10 used for production, 9 for reinjection, and 1 for condensation reinjection. The plant operates with an annual production amount of 300,000,000 kWh, achieving a capacity factor of 96%.

The production technology in geothermal energy involves extracting ground heat to the surface through fluids and drilling, converting this energy into electrical energy, and using it directly as heat energy or in various applications within the industrial and tourism sectors.

From a bird's-eye view, the project area is approximately 0.50 km away from Çağlayan village, 1.5 km from Piyadeler village, and 1.5 km from Ürsu village. Additionally, key centers such as Salihli, Kula, and Alaşehir are approximately 23 km, 20 km, and 1.5 km away, respectively. The Alaşehir GPP facility is situated within the borders of Alhan, Çeşneli, and Akkeçili villages (Figures 3-4).

Significant water bodies surround the project site. From a bird's-eye view, Demirköprü Dam is approximately 25 km away, Afşar Dam is 11 km away, and Gölcük Lake is 32 km away (Figure 5).

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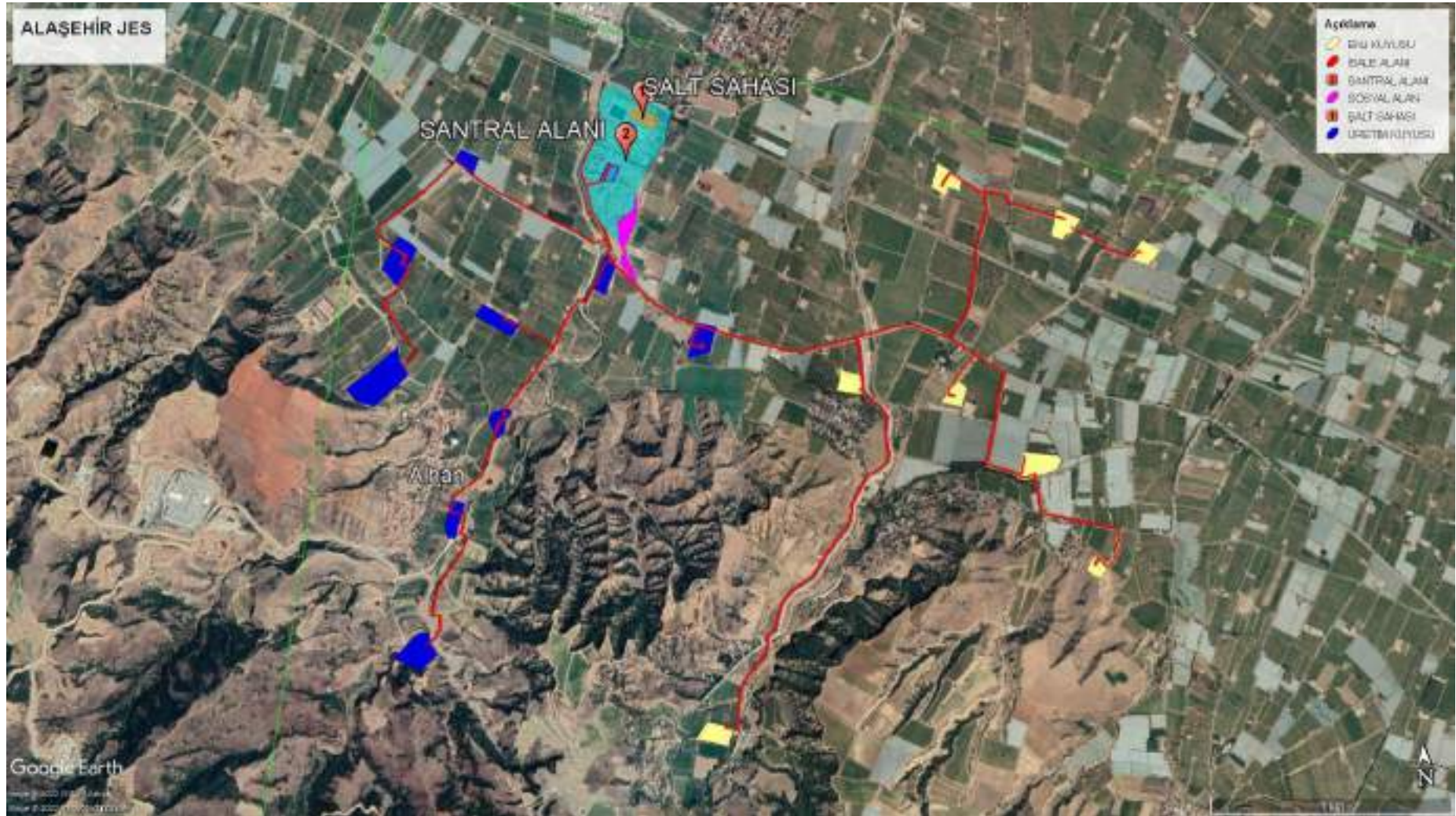


Figure 1: Satellite Image of the Alaşehir GPP Site

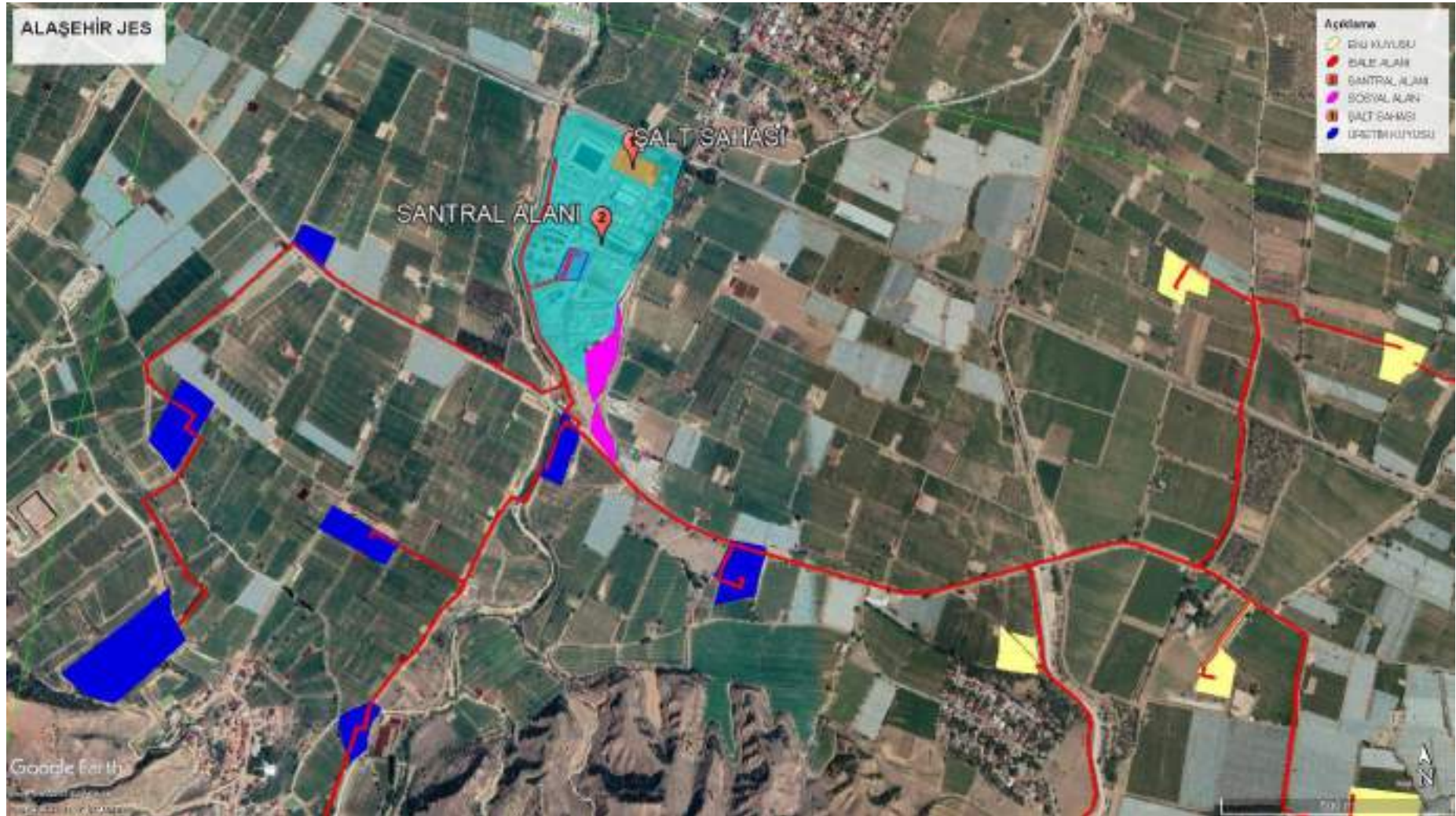


Figure 2: Satellite Image of the Alaşehir GPP Site

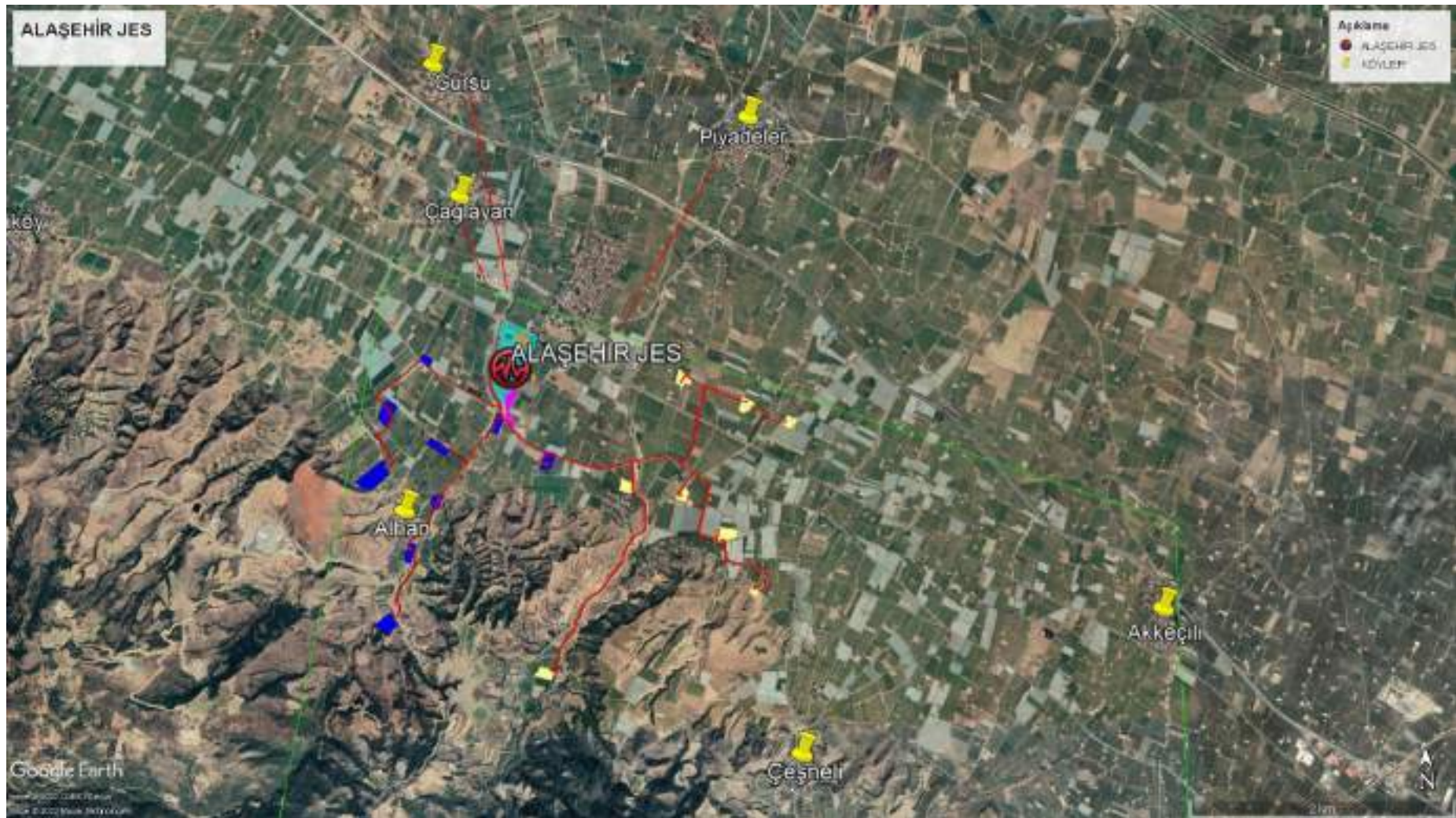


Figure 3: Village (Neighborhood) Settlements in the Vicinity of the Project Site

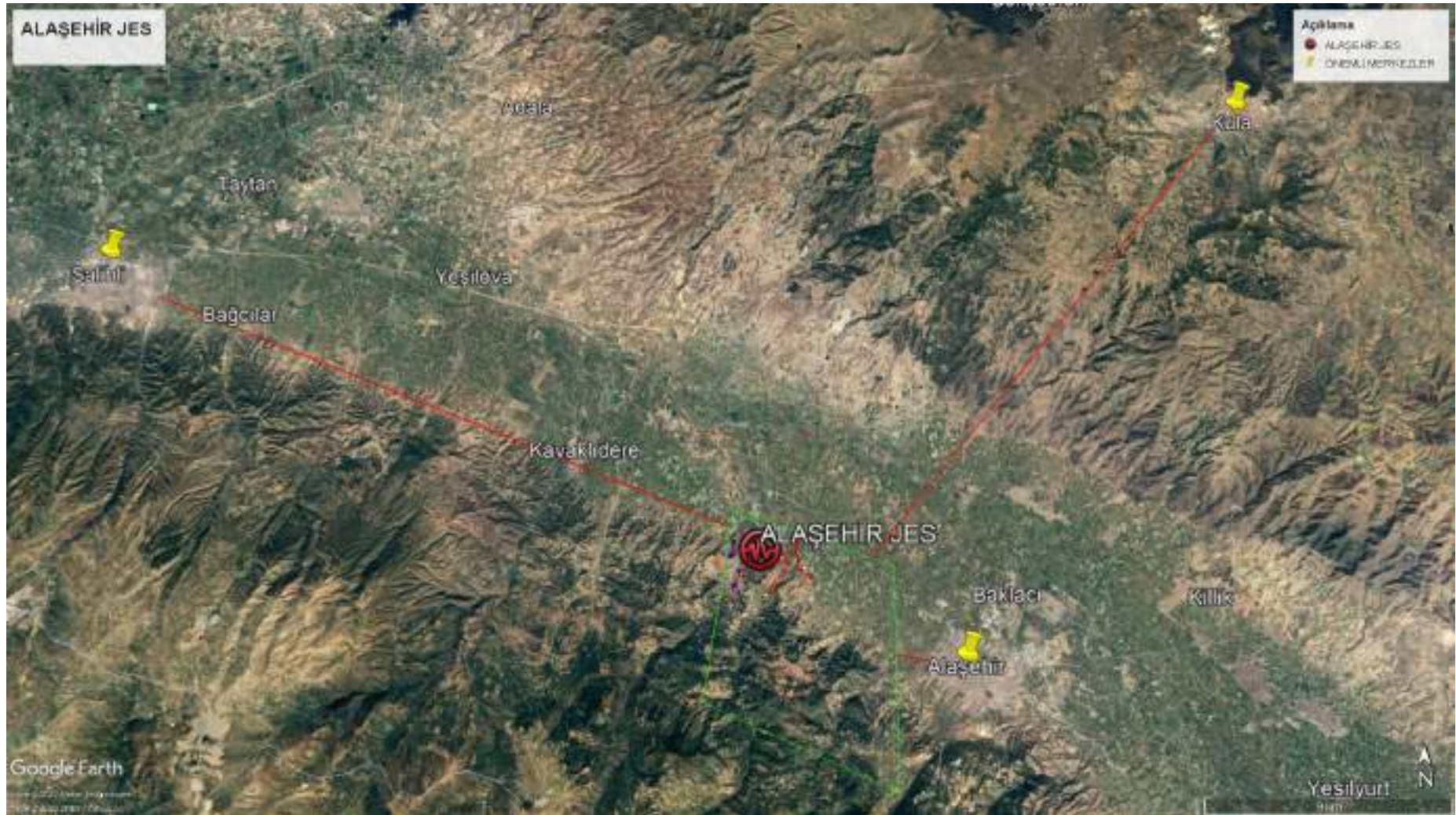


Figure 4: Settlements in the Vicinity of the Project Site

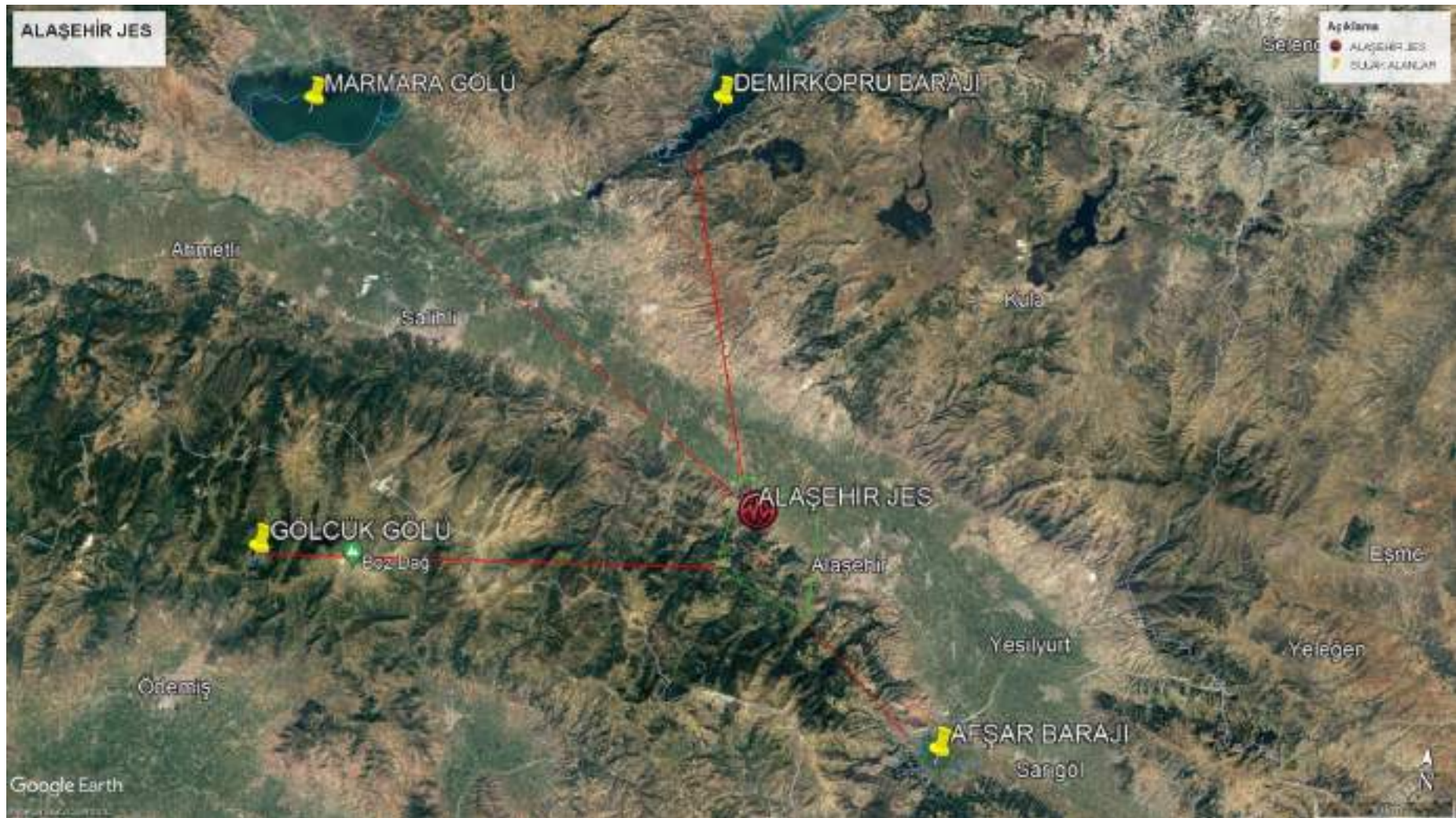


Figure 5: Important Water Bodies Around the Project Site

1.2 Relationship of the Field with Protected and Special Status Areas

When evaluating the location of the Alaşehir GPP site in relation to the surrounding protected areas and important natural areas, the Project Site is within the boundaries of Bozdağlar Key Biodiversity Area (KBA). From a bird's eye view, Marmara Lake is approximately 33 km away from the project site, and the Kula Fairy Chimneys protected areas are also 33 km away (Figures 6-8).



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

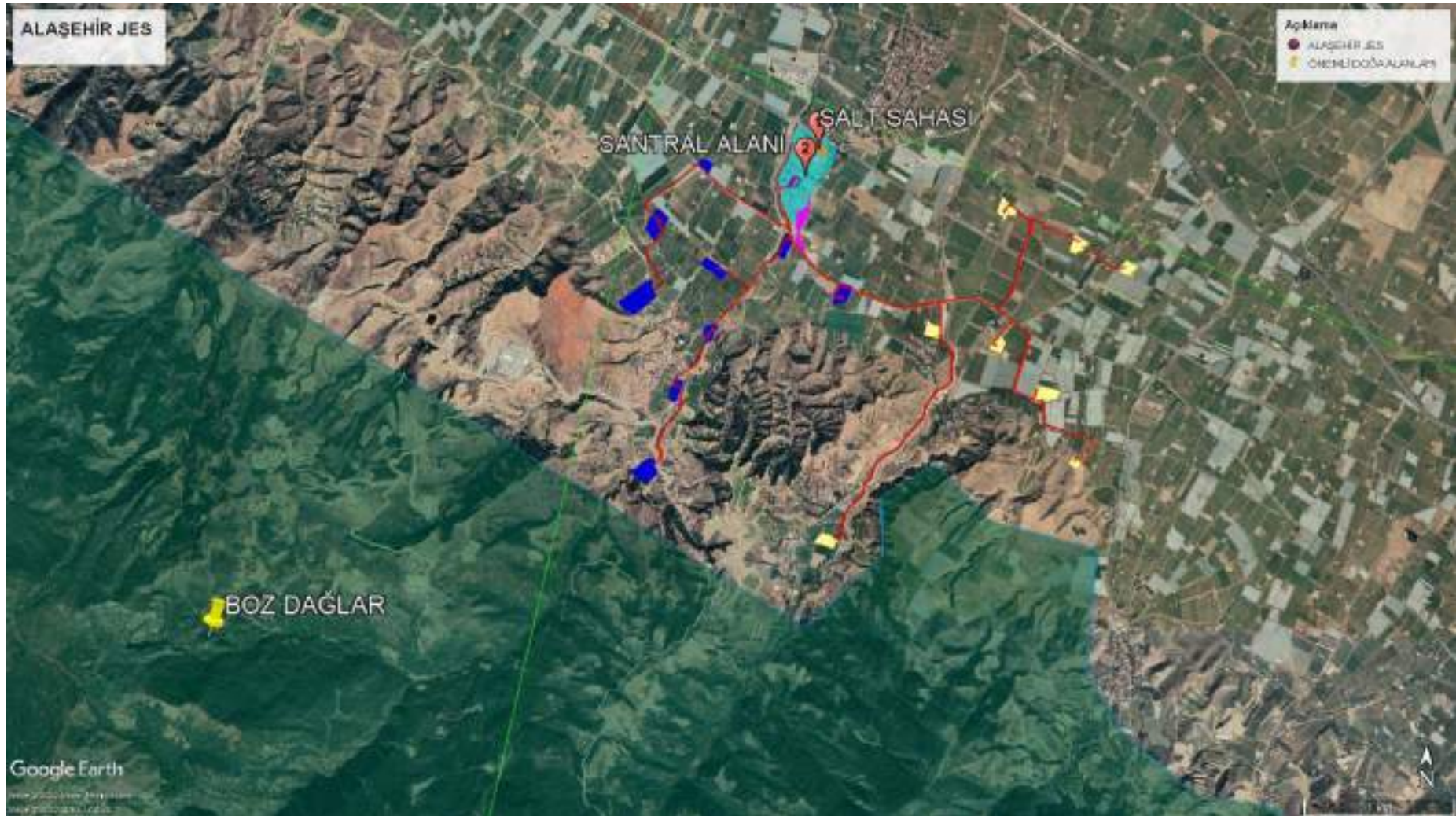


Figure 8: Satellite Image Showing the Relationship Between the Project Site and Protected Areas

1.3 Identification and Classification of Habitats in the Alaşehir GPP Facility Area

Zorlu Jeotermal Enerji Elektrik Üretim A.S operates a geothermal energy power plant with an installed capacity of 45 MWe in the agricultural area covering a total of 39,975 m², located in Manisa Province, Alaşehir District, Erenköy, Osmaniye, and Çeşneli Villages. The project site is detailed on the 1/25,000 scale topographic map, İzmir L20-b2 sheet, in parcels numbered 27, 28, 30, and 31. Within the scope of the Alaşehir-1 Geothermal Power Plant (GPP) project, there are 20 geothermal wells, with 10 used for production, 9 for reinjection, and 1 for condensation reinjection. The plant operates with an annual production amount of 300,000,000 kWh and a capacity factor of 96%.

The project area contains 12 different habitat types. Of these habitats, 4 are natural, and 8 are classified as modified habitats. The 1st, 2nd, and 3rd level codes and the vegetation types in natural areas, according to the EUNIS Habitat Classification, are provided below (Figure 9).



Alasehir JES EUNIS Habitat Haritası

Ölçek: 1:8,000

- ** Tesis binaları
- * C2.3 : Mevsimsel olmayan yavaş akan akarsular
- * E2 : Mezik çayırlar/bozkırlar
- ** E2.64 : Çimlik alanlar, park çimlikleri
- * G5 : Antropojenik ormanlar, baltalıklar, ağaç sıraları
- * H5 : Bitki örtüsü seyrek ağkılık alanlar
- ** 11.3 : Yoğun olayan tarımsal yöntemlerle yetiştirilen ürünlerin ekili olduğu tarım alanları
- ** 12.3 : Kırsaldaki aktif kullanılan endüstriyel yapılar
- ** 14.2 : Yol ağları
- ** 14.6 : Kaldırımlar, beton yüzeyler, rekreasyon alanları
- ** 15.3 : Yapay ve durağan su gövdeleri
- ** 15.42: Endüstriyel kazı sahalarından çıkan sıradışı kimyali su
- ** 16.1: Bina yıkım ve inşaat atıklarının depolandığı alanlar



0 140 280
Meters

Shape 9 Alasehir JES EUNIS habitat Map one

➤ **Natural habitats**

C2.3 seasonal Non Slow Flowing streams

At an altitude of 160 m in the field; *consolida ambigua* , *Silene anatolica* , *Datisca cannabina* , *Echinops rithro* , *Cynanchum acutum subsp . acutum*, *Cionura erecta* , *Lycium depressum* , *Hordeum spontaneum* , *Foeniculum vulgare* , *Apera intermedia* plant taxa were identified.

E2 Mezik Meadows/Steppes

In this habitat observed at an altitude of 160 m within the facility area; *ranunculus marginatus* var. *tetrachycarpus* , *Dianthus anatolicus* , *Hypericum perforatum* , *Trifolium hybridum* var. *anatolicum* ,, *Medicago sativa subsp . sativa*, *potentilla astracana* , *Sanguisorba minor subsp . lasiocarpa* , *Sanguisorba minor subsp . lasiocarpa*, *Daucus carota* , *Achillea nobili subsp . sipylea* plant taxa were identified.

G5 anthropogenic Forests, coppices, Tree rows

In this habitat, which starts 200 m within the facility area; *ranunculus sprunerianus* , *Cardamine graeca* , *Dianthus calocephalus* , *Vicia grandiflora* var. *grandiflora* , *Lathyrus laxiflorus subsp . laxiflorus* , *Anthyllis vulneraria subsp . praepropera* , *Prunus spinosa subsp . dasyphylla* , *prunus divarica subsp . divaricata* , *Potentilla micrantha* , *Pyrus amygdaliformis* var. *amygdaliformis* , *Bupleurum asperuloides* , *Foeniculum vulgare* , *Helichrysum graveolens* , *Centaurea triumfettii* There are plant taxa .

H5 Herb Cover Rare Clearance Areas

On site 230 m at altitude; *dianthus calocephalus* , *gypsophila tubulosa* , *Silene otitis* , *eryngium campestre* var. *campestre* , *Scandix australis subsp . grandiflora*, *scabiosa argentea* , *Anthemis pauciloba* var. *pauciloba* ,, *achillea coarctata* plant taxa were identified.

➤ **Modified habitats**

Areas with habitat codes I1.3, J2.3, J4.2, J5.3, J5.42, J6.1 are in the nature of concrete, chemical water and 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.

Invasive species of plants used for landscaping and food purposes in habitat coded E2.64 and J4.6 Care should be taken to ensure that there is no

1.4 Alaşehir JES facility Effect in the field floristic Defining Biodiversity

When we look at the vegetation of the project site and its surroundings; Most of them are agricultural areas where products grown using non-intensive agricultural methods are planted. While mesic meadows are spreading next to non-seasonal, slow-flowing streams, anthropogenic coppice forests and steppe character plants are spreading in groups towards the hilly slopes.

IFC PS-6 and Guidance in terms of floristics at the Alaşehir GPP facility site Considering the Note 6 criteria , since there are no plant taxa with CR and EN status, critical species and habitat assessments were not made within the scope of IFC.

1.5 Alasehir JES facility Effect in the field faunistic Defining Biodiversity

1.5.1 Amphibian

There is no endangered and/or endemic amphibian species in the project area. located in the area amphibian types widespread species. Project in the field amphibians in terms of One immortality and the precautions to be taken are not foreseen. During the transportation of process water to some areas, water leaking into the ground creates suitable spots for amphibians.

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

The only reptile species in the project area that is vulnerable to extinction according to IUCN lists **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. Also in the region **is the Anatolian lizard (*Anatololacerta*)**, a largely endemic lizard. ***anatolicus*)** is distributed. This species has a wide distribution from the Büyük Menderes River northward to the Marmara Region. The IUCN category is LC .

There are no reptile species that are likely to be directly affected by the project. The facilities have been operating in the region for many years. Although there may be species affected by the project during the construction phase, the facilities do not emit any emissions such as noise, dust, or polluted air into the environment during the current operation phase.

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

Criterion one: Critical In danger (CR) And /Or Danger under (MOST) Types expression It does. **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. Anatolian lizard (*Anatololacerta*) , *which is endemic to the project site anaticus*) is distributed. The distribution area of this endemic species is more than 50,000 square kilometers (km²). is too much. It is not possible to say that the project site is an area that regularly hosts $\geq 10\%$ of the global population size of this species and ≥ 10 of the reproductive units of a species. In this regard, according to available information, the project site **does not meet the threshold value for Criterion 2.**

Criterion 3: Immigrant and/or Community In case of condensing Types expression It does. **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

in the region generation in danger and/or endemic One mammal There is no type .

Criterion one: Critical In danger (CR) And /Or Danger under (MOST) Types expression It does. **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: Immigrant and/or Community In case of condensing Types expression It does. **There is no** mammal species in the project area that meets this criterion .

Criterion 4: Refers to Highly Threatened and /or Uniquely Rare Ecosystems. 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 .

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 areas 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 connection also extends across elevation and climate gradients and across crest-to- coast to coast)” also includes biological corridors.

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 in areas that have been previously investigated and are known or suspected to be associated with unique evolutionary processes. Even if 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 Alaşehir GPP 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 a large number of critical species. In this regard, the area **does not meet** Criterion 5 .

1.5.4 Ornithology

As a result of the studies, a total of 12 bird species were identified in the project area and its immediate surroundings. The list of these species, their global Red List status, and the status of the species in BERN, CITES and MAK decisions of 2022 are given in Table 1 below.

It has been observed that none of the bird species around the facility are threatened on a global scale. (IUCN, 2022). 10 of the identified species are in BERN Agreement Annex-2, 2 are in BERN Agreement Annex-3 and 2 are in CITES Annex-2.

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

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

No “CR” or “EN” category bird species were detected around the facilities. Therefore, this criterion is not triggered.

Criterion 2: endemic And Narrow widespread Species For Important Habitats

Facility birds around This criterion It does not trigger.

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

The Alaşehir GPP site does 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 one Project in the field Found and Finding Likely Bird Types

Type Scientific First Name	English Name	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Butea rans</i>	Red Hawk	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Circaetus gallicus</i>	Snake Eagle	Not Endemic	LC	Annex 2	KD	Annex 2
<i>Coracias garrulus</i>	European Roller	Not Endemic	LC	Annex 2	KD	KD
<i>Dendrocoptes medius</i>	Middle Spotted Woodpecker	Not Endemic	LC	Annex 2	KD	KD
<i>Dendrocopos syriacus</i>	Syrian Woodpecker	Not Endemic	LC	Annex 2	KD	KD
<i>Emberiza hortulana</i>	Ortolan Bunting	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Hippolais olivetorum</i>	Olive-tree Warbler	Not Endemic	LC	Annex 2	KD	KD
<i>Lanius collurio</i>	Red-backed Shrike	Not Endemic	LC	Annex 2	Annex 1	KD
<i>Lanius nubicus</i>	Masked Shrike	Not Endemic	LC	Annex 2	KD	KD
<i>Lullula arborea</i>	Woodlark	Not Endemic	LC	Annex 3	Annex 1	KD
<i>Pyrrhonorax pyrrhonorax</i>	Red-billed Chough	Not Endemic	LC	Annex 2	KD	KD
<i>Oenanthe isabellina</i>	Isabelline Wheatear	Not Endemic	NT	Annex 2	KD	KD

1.6 Alaşehir JES facility Effect in the field hydrobiological Defining Biodiversity

In the study conducted at Alaşehir GPP facilities, no algae, zooplankton , benthic aquatic organisms or fish were found.

1.7 Biodiversity Risk Evaluation

1.7.1 Flora

IFC PS-6 and Guidance in terms of floristics at the Alaşehir GPP facility site Considering the Note 6 criteria , since there are no plant taxa with CR and EN status, no critical species and habitat assessment was made within the scope of IFC.

Care should be taken to ensure that the plants used for landscaping and food purposes in the habitat coded E2.64 and J4.6 are not invasive species.

1.7.1.1 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 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 identified within the project's impact area (Table 2). 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, in order 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 2 Project in the field Found And Finding Likely Invader Species

<i>Acer negundo</i> (ash tree leafy maple) Areas open to andropogenic influence	
<i>Agropyron repens</i> (Separate herb) Field, open area	
<i>Ailanthus altissima</i> (Kokarağaç) andropogenic to the effect open spaces	
<i>Amaranthus retroflexus</i> (Fox dry) Field, open area	

Boreava orientalis (Sariat) Field, roadside



chenopodium album (While crying) Flood, flood bearings



Cirsium arvense (Köygöçüren) Flood, flood bearings



conyza canadensis (cypress) andropogenic to the effect open fields



conyza bonariensis (Coyote) andropogenic to the effect open fields



conyza albida (Maplewort) andropogenic to the effect open spaces



Cuscuta campestris (Turkish) meadow-pasture habitats



Lepidium draba (Diġnik) andropogenic to the effect open spaces



nasturtium officinale (Suteresi) streamside



Reseda lutea (Love flower) Path edge, field



rumex acetocella (Sorrel) Path edge, field And barren places



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

Paspalum distichum (This discrete) This communities inside on channels



Robinia pseudoacacia (White flowering liar acacia) roadsides



Xanthium strumarium (Big Pitarak) Flood, flood bearings



Xanthium spinosum (Yellow Pitarak) Flood, flood bearings



Viscum album (Lime herb) to the trees interference



1.7.2 Fauna

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

Tortoise (*Testudo graeca*): This species has been seen around the area. Its presence in the region has been assessed sparsely. 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.

1.7.3 Ornithology

IFC PS-6 and Guidance Considering the Note 6 criteria, “critical type” evaluation and “critical habitat” assessment in chapter 5 made is, birds in the area in terms of There are no critical species.

It has been observed that none of the bird species around the facility are threatened on a global scale.

1.7.4 Hydrobiology

The underground water temperature used in the environment is around 100 °C. There are no species that can be considered important in terms of biodiversity in underground geothermal water. However, in case of any possible negativity This hot water, which will mix with nature (necessary precautions have been taken against all kinds of negativities in the facility), may harm other living things around it.

1.7.5 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,
- weather 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 3 .

Table 3 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. Regarding the issue dated 26.06.2021 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 31.2004 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 23.1960 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	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; 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. 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".
		Medical Wastes	For medical waste generated within the scope of the activity; waste at the source -most member will download system establishment 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, 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.
		Waste Electronic Things	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.
		Waste oils	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 21.2019 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

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 06.06.2015 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 .
		Tires that completed its life	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.

At the facility, care should be taken to store waste scrap materials on concrete floors rather than soil.

the business is subject to Environmental Permits on Air Emission, Noise Control, and Wastewater Discharge within the scope of the Environmental Permit and License Regulation, and within this scope, it has been determined that the Provincial Directorate's Certificate of Conformity has been approved.

Domestic wastewater generated within the scope of the project is subjected to package treatment and discharged to the receiving environment. In this context, within the scope of domestic wastewater generated during the operation phase , the provisions of the "Water Pollution Control Regulation", which came into force after being published in the Official Gazette No. 25687 dated 31.2004, must be complied with. An analysis must be made by accredited companies by applying to the MELBES system of the Ministry of Environment, Urbanization and Climate Change at the package treatment outlet. In addition, the provisions of the Water Pollution Control Regulation and the Regulation on the Protection of Drinking and Domestic Water Basins must be complied with during the operation.

Emission measurements of the chimneys in the facility must be made regularly by accredited companies by applying to the MELBES system of the Ministry of Environment, Urbanization and Climate Change, within the scope of the provisions and principles specified in the Regulation on Control of Industrial Air Pollution.

of the facility Environmental of noise Evaluation And Management In the regulation stated Within the scope of the provisions and principles, the Ministry of Environment, Urbanization and Climate Change, MELBES Acoustic Reports can be prepared by accredited companies by applying through the system. needs to be prepared.

1.8 Biodiversity Action plan

Alasehir JES facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
AL1	Business	Fauna Conservation of Species	Project Area And surroundings	Tortoise (<i>Testudo Graeca</i>) and Anatolian Lizard (<i>Anatololacerta</i> Training for Facility Employees About <i>Anatolicus</i>) Species should be given	Biologists who are experts on the subject Training Should Be Provided by	During Operation	April-May 2024 1 Time
AL2	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	2023 May
AL3	All Habitats	Invader Blocking Species	Project Area And surroundings	Investigation of Invasive Species Found in the Project Area and Surroundings Project Area And Around by watching Dismantling Plan Must Be Prepared	Population by Expert Biologists Level Monitoring	During Operation	one Year Duration in July and August
AL4	Business	Prevention of Environmental Pollution	Project Area	All Occurrences Within the Business of waste Waste Storage in Temporary Waste Storage Areas in accordance with Waste Codes within the Scope of Management Regulation It should be done.	Company By	During Operation	During Operation

Alasehir JES facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
AL5	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	Maximum 6 on the moon one
AL6	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	Maximum 1 per year
AL7	Business	Prevention of Environmental Pollution	Project Area	and Principles Specified in the Regulation on the Control of Industrial Air Pollution from the Chimneys in the Facility Environment, Companies Accredited by Application from the Ministry of Urbanization and Climate Change, Melbes System By Emission Measurements Organised in the figure to be done It is necessary.	Company By/Environmental Officer/Environmental Consultancy Firm	During Operation	2 per year one

Alasehir JES facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
AL8	Business	Prevention of Environmental Pollution	Project Area	Environment, Urbanization and Climate Change from Package Treatment Output within the Scope of Domestic Wastewater ministry, Accredited by Application through the Melbes System Analysis by Companies It is necessary.	Company By/Environmental Officer/Environmental Consultancy Firm	During Operation	4 on the moon one

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	

GÖKÇEDAĞ RES BUSINESS BIODIVERSITY ACTION PLAN

1.1 Entrance

Rotor Elektrik Üretim A.Ş. is operating the Gökçedağ Wind Power Plant (WPP) located in the Arıcaklı, Kızlaç, Kaman, Kozdere, Kuşcumustafa, and Gökmustafalı areas within the Bahçe, Hasanbeyli, and Nurdağı districts of the Osmaniye and Gaziantep provinces. The current installation includes a total of 58 turbines with an installed capacity of 150.6 MWm. Additionally, the project plans to incorporate a Solar Power Plant (SPP) as an auxiliary source with a capacity of 9.6088 MWm/8.00 MWe over an area of 12.8716 hectares.

The village of Savranlı is located approximately 1 km away from the project site in a direct line. Furthermore, Fevzipaşa village is about 1.2 km away, Hasanbeyli village is 3 km away, Sarayova village is 4.5 km away, and Zincirlihöyük village is 4 km away from the project site. In addition, the major centers of Bahçe (about 1.3 km away in a direct line), Nurdağı (5 km away), İslahiye (4.5 km away), and Osmaniye (30 km away) are located nearby (Figures 3-4).

There are significant wetlands within the vicinity of the planned area that could attract birds. The Aslantaş Dam is located 30 km away, and the Tahtaköprü Dam is 21 km away from the site in a direct line (Figure 5).

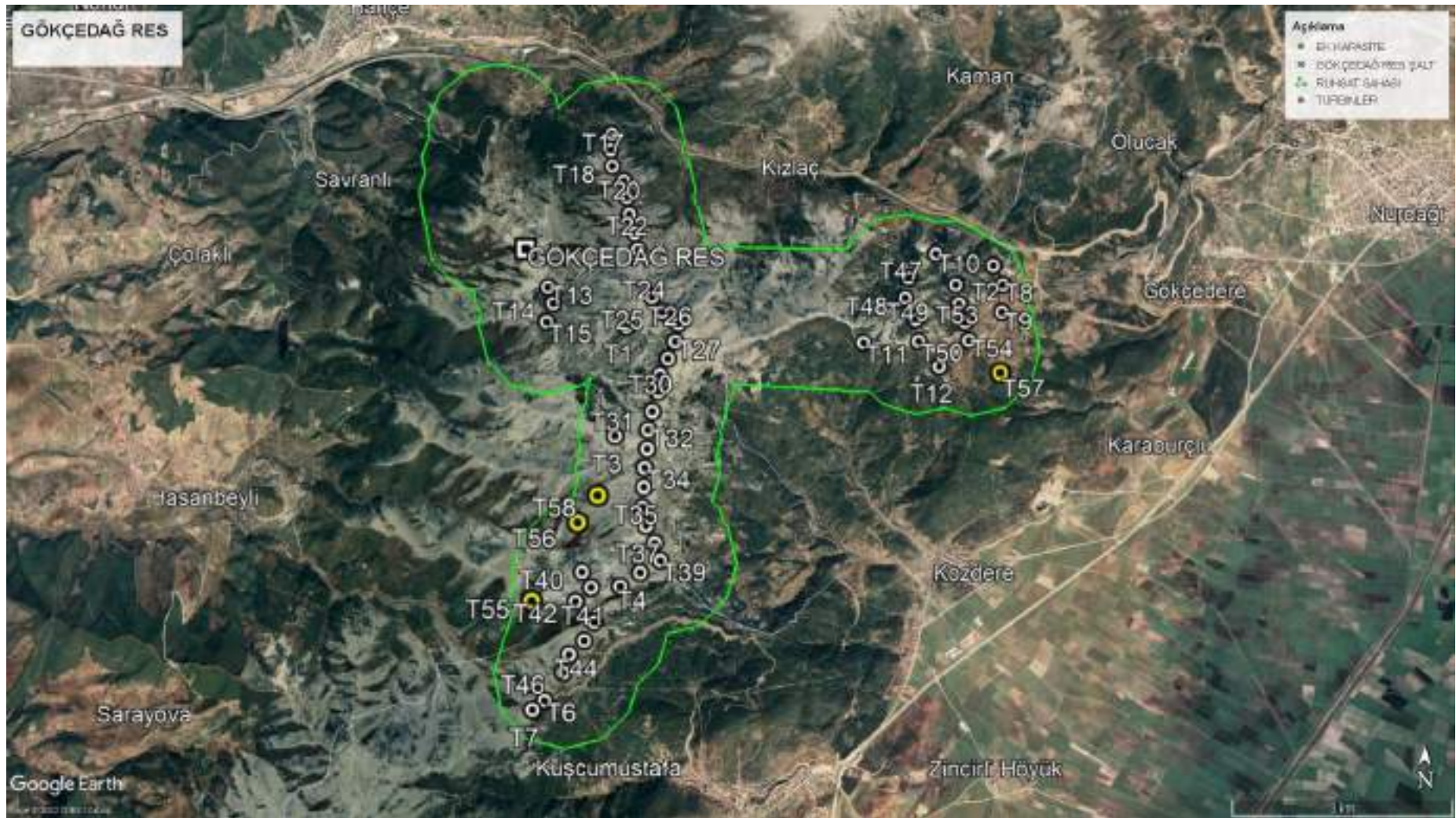


Figure 1: Satellite Image of the Project Site

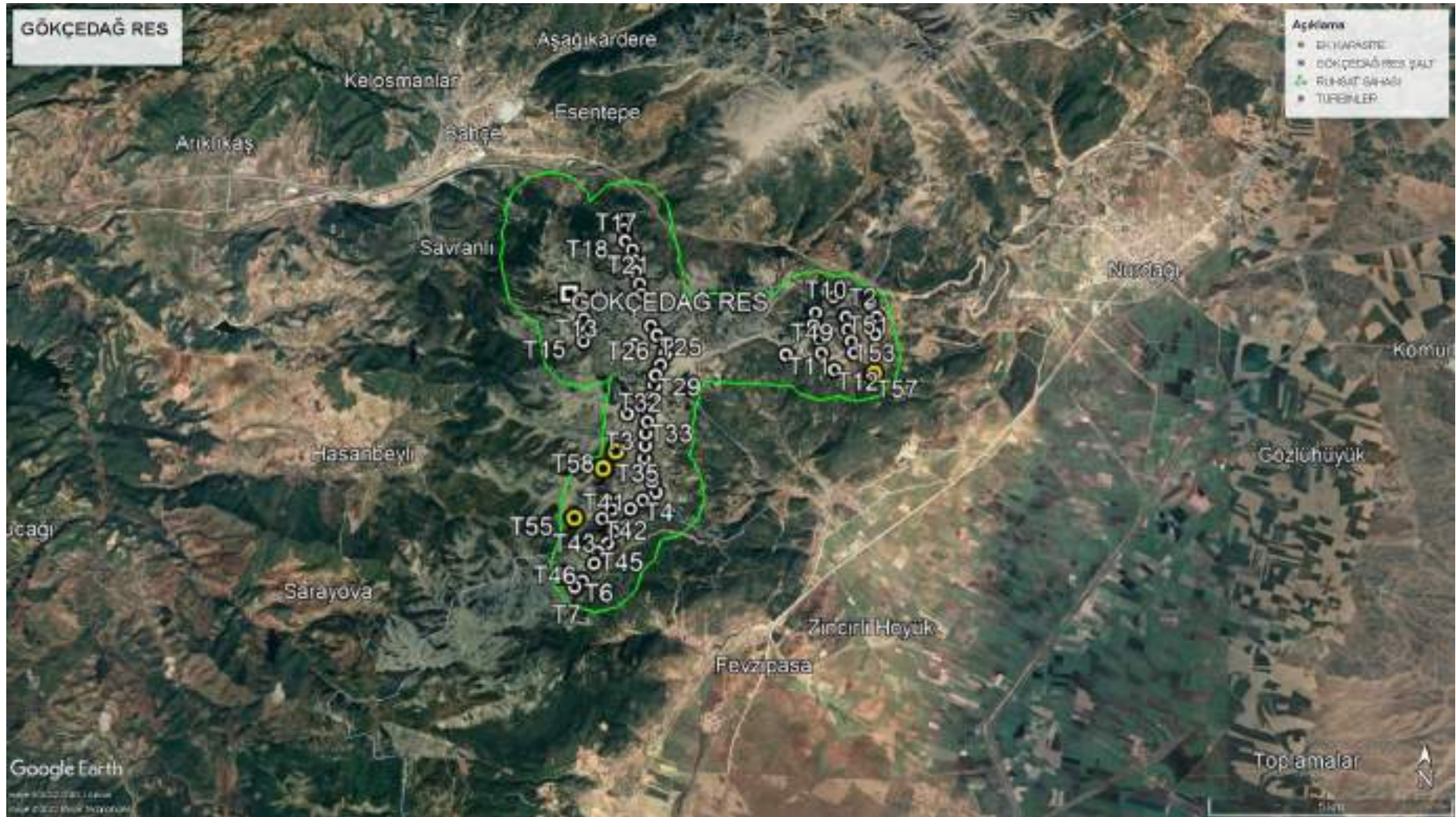


Figure 2: Satellite Image of the Project Site

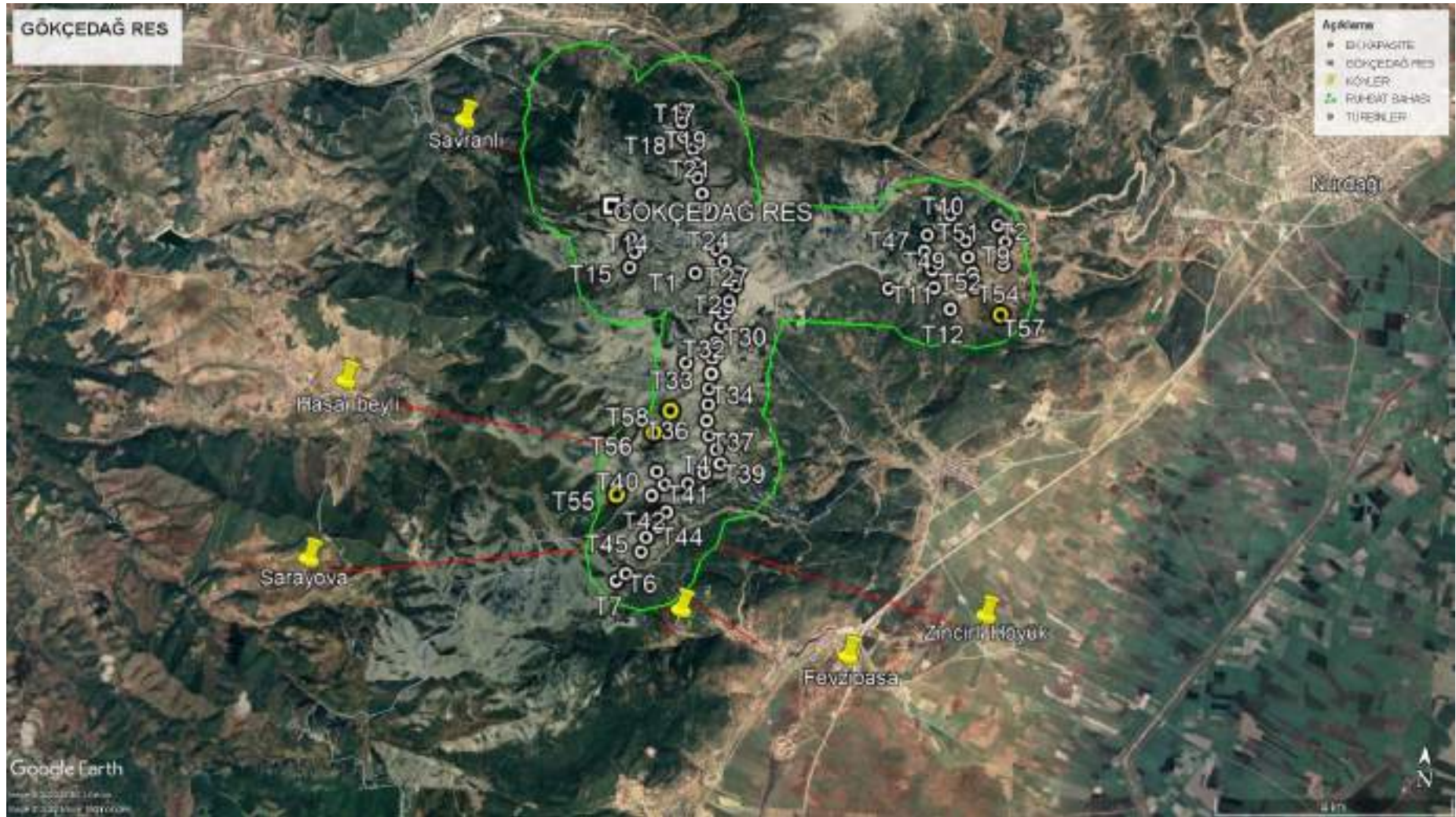


Figure 3: Village (Neighborhood) Settlements Near the Project Site

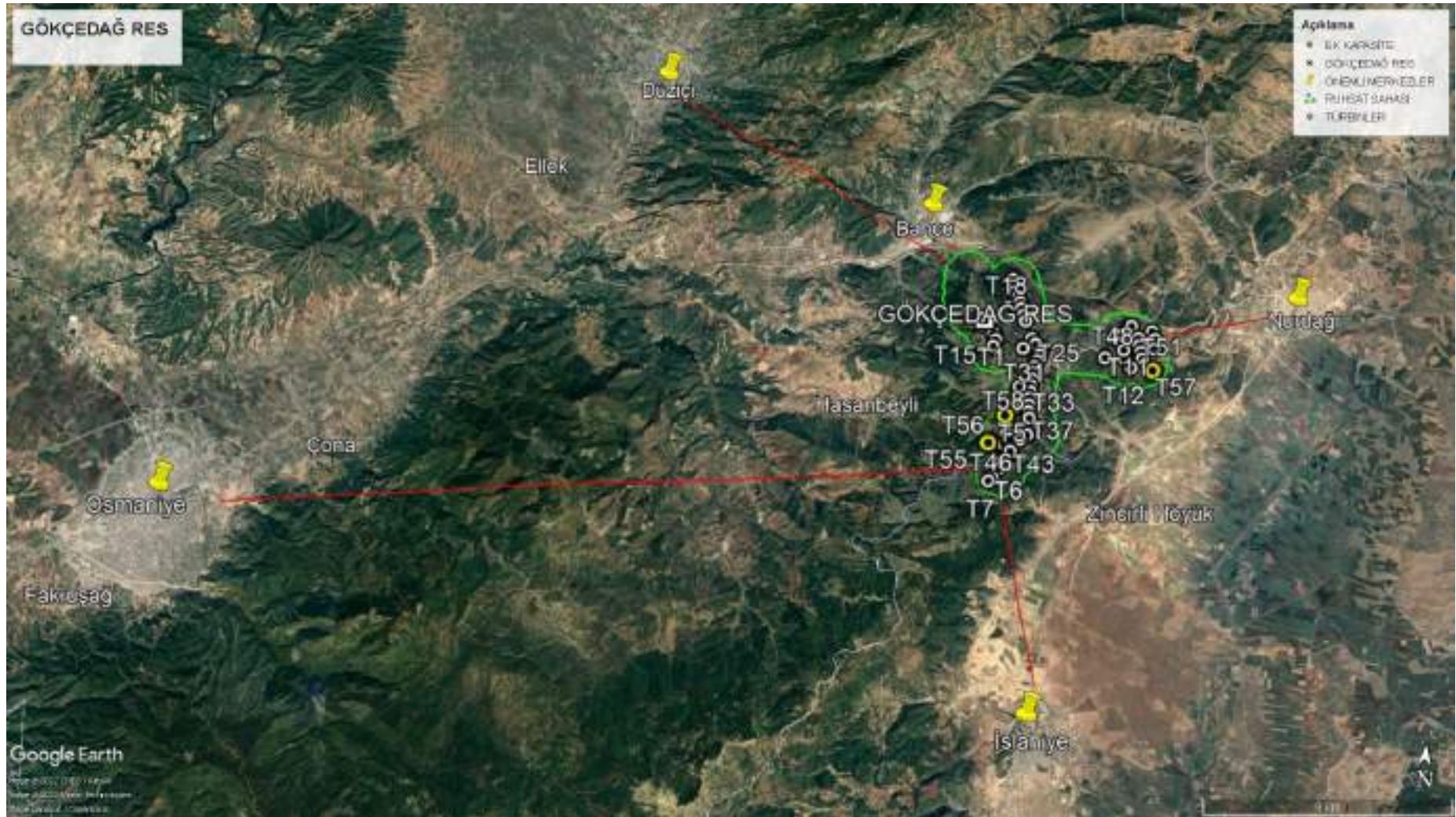


Figure 4: Settlements Near the Project Site

1.2 Relationship of the Area with Protected and Special Status Areas

Rotor Elektrik Üretim A.Ş. is operating the Gökçedağ Wind Power Plant (WPP) located in the Arıcaklı, Kızlaç, Kaman, Kozdere, Kuşcumustafa, and Gökmustafalı areas within the Bahçe, Hasanbeyli, and Nurdağı districts of the Osmaniye and Gaziantep provinces. The current installation includes a total of 58 turbines with an installed capacity of 150.6 MWm. Additionally, the project plans to incorporate a Solar Power Plant (SPP) as an auxiliary source with a capacity of 9.6088 MWm/8.00 MWe over an area of 12.8716 hectares.

A part of the Gökçedağ WPP licensed area is within the boundaries of the Amanos Mountains Important Natural Area (INA), one of the 305 Important Natural Areas proposed by Eken et al. (2006), which does not provide any official protection status. However, the planned SPP area is outside the boundaries of the Amanos Mountains INA (Figures 6-7).

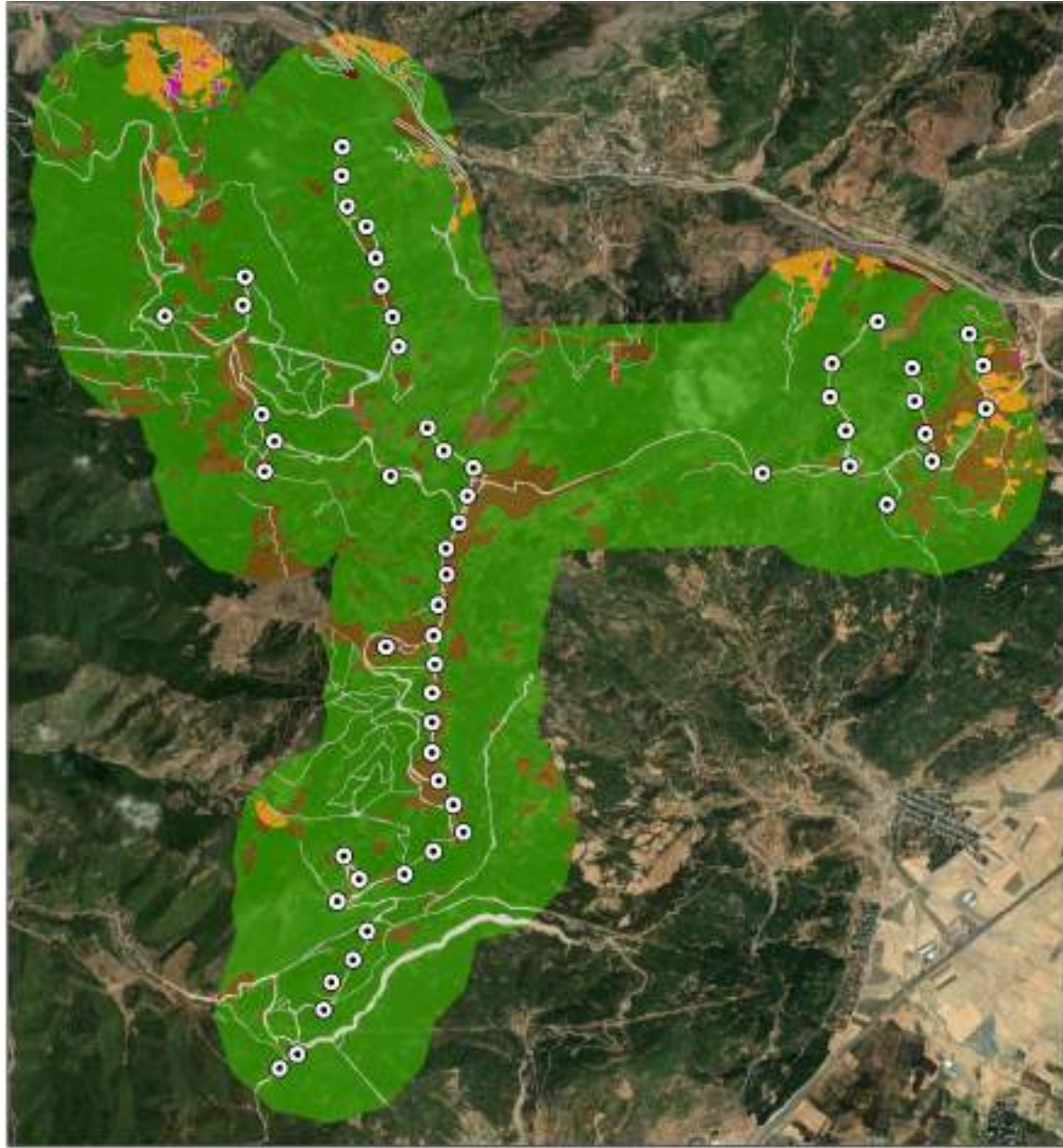


Figure 6: Satellite Image Showing the Relationship Between the Project Site and Protected Areas

1.3 Identification and Classification of Habitats within the Impact Area of Gökçedağ WPP

Rotor Elektrik Üretim A.Ş. is operating the Gökçedağ Wind Power Plant (WPP) located in the Arıcaklı, Kızlaç, Kaman, Kozdere, Kuşcumustafa, and Gökmustafalı areas within the Bahçe, Hasanbeyli, and Nurdağı districts of the Osmaniye and Gaziantep provinces. The current installation includes a total of 58 turbines with an installed capacity of 150.6 MWm.

There are 9 different habitat types within the project area. Four of these habitats are natural, while the remaining five are characterized as modified habitats. The vegetation types developing in natural areas are characterized by their EUNIS Habitat Classification Level 1, 2, and 3 codes, and the species that characterize these vegetation types are provided below (Figure 8).



Gökçedağ RES EUNIS

Habitat Haritası

Ölçek: 1:40,000

0 1000 2000
Meters

- ⊙ Türbinler
- * G: Ormanlık alanlar
- * G5: Antropojenik ormanlar, baltaçlıklar, ağaç sıraları
- * H3: Sarp yamaçlar, ana kayanın yüzeye çıktığı taşlık alanlar
- * H5: Bitki örtüsü seyrek açık alanlar
- ** I1.3: Yoğun olmayan tarımsal yöntemlerle yetiştirilen ürünlerin ekili olduğu tarım alanları
- ** J2.1: Kırsaldaki aktif kullanılan dağın binalar
- ** J2.3: Kırsaldaki aktif kullanılan endüstriyel yapılar
- ** J4.2: Yıl ağları
- ** J4.6: Kaldırımlar, beton yüzeyler, rekreasyon alanları

Figure 8: Gökçedağ WPP EUNIS Habitat Map

➤ Natural habitats

G Forested Areas

The forest vegetation, which is distributed in the altitude range of 700-1600 m, exhibits a vegetation structure in which larch forest habitats transition between each other as the oak at lower altitudes moves upwards. The plant taxa identified are ; *Juniperus communis* , *Juniperus excelsa* , *Juniperus oxycedrus* , *Pinus brutia* , *Pinus nigra* , *Quercus infectoria* , *Quercus petraea* , *Quercus cerris* , *Pistacia terebinthus* , *Achillea biebersteinii* , *Achillea falcata* , *Anthemis There is kotschyana . kotschyana* , *Centaurea babylonica* , *Pilosella hoppeana* , *Tanacetum aucheri* , *Asyneuma limonifolium* , *Campanula rapunculoides subsp . rapunculoides* , *Hypericum thymifolium* , *Phillyrea latifolia* , *Piptatherum miliaceum* , *Scrophularia scopolii* .



Photograph 1: Black Pine Forest Communities (EUNIS: G)



Photograph 2: Oak Communities (EUNIS: G)

G5 anthropogenic Forests, coppice Forests

They are forested areas whose cover has been broken by human influence, just behind the end points of agricultural activities close to residential areas at lower altitudes. It contains the same species as the plant taxon composition of the forests described with the G EUNIS code .

H3 Steep slopes, bedrock emerge dating Gizzard Fields

That occur intermittently at altitudes of 1500 m and spread in these habitats; *I was onoporum polycephalum* , *Tragopogon longirostis* , *Iberis attica* , *Isatis lusitanica* , *Thlaspi microstylum* , *Saponaria glutinosa* , *Fumana procumbens* , *sedum cepaea* , *sedum sempervivoides* , *Astragalus commagenicus* , *Lamium truncatum* , *Phlomis viscosa* , *Salvia multicaulis* , *Salvia viridis* , *Viola kitaibeliana* .

H5 Herb Cover Rare Openness Fields

wind turbines are installed; *Echinophora tournefortii* , *Tordylium syriacum* , *Turgenia latifolia* , *Anthemis cotula* , *Anthemis kotschyana* , *Anthemis tinctoria* var. *tinctoria* , *Artemisia absinthium* , *carduus nutans* subsp . *nutans*, *crepis sancta*, *helichrysum armenium* subsp . *armenium* , *inula germanica* , *Myosotis lithospermifolia* , *Alyssum minutum* , *Erophila verna* , *Euphorbia macroclada* , *Euphorbia rigida* , *Euphorbia paralias* , *Medicago orbicularis* , *Onobrychis viciifolia* , *Trifolium resupinatum* , *Erodium moschatum* , *Hypericum perforatum* plant taxa were identified.



Photograph 3: Sparse Vegetation Open Areas (EUNIS: H5)



Photograph 4: Sparse Vegetation Open Areas (EUNIS: H5)

➤ **Modified habitats**

Areas with habitat codes J2.1, J2.3, J4.2, J4.6 are concrete and asphalt and do not have floral content. However, cleaning the seeds that germinate in the cracks in these structures is important for the integrity of the system. Care should be taken to ensure that the plants used for landscaping and food purposes in the habitat coded J4.6 and I.1.3 are not invasive species.

1.4 Gokcedag RES facility Effect in the field floristic Defining Biodiversity

Vegetation structure of Gökçedağ WPP site; A large part of it consists of natural deciduous, coniferous or mixed forest areas. In addition, in habitats open to andropogenic effects at lower altitudes close to settlements, the forest cover has been broken and taken on a coppice appearance. In addition, agricultural areas and fruit trees are located close to human settlements. It consists of mountain steppe and rocky area habitats towards higher altitudes, as well as gardens .

IFC PS-6 and Guidance in the facility area CR and EN status, complying with Note 6 criteria No plant taxon was found. Therefore, there is no critical habitat supporting these taxa .

1.5 Gokcedag RES facility Effect in the field faunistic Defining Biodiversity

1.5.1 Amphibian

endangered and/or endemic amphibian species that may be found 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 the 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. Additionally, the **Amanos Snake (*Rhynchocalamus*)**, an endemic snake species **barani**) is likely to be widespread in the project area. The IUCN criterion for this species is given as DD because there is not enough data about the species. The Big viper (***Macrovipera***) , which is also a poisonous snake species **lebetina**) is widespread in the project area. The IUCN criterion for this species is LC and it is not an endangered or narrowly distributed species. It is a species that project workers should be aware of and be cautious about, just because it is poisonous.

Since the project is currently in the operational phase, no ongoing negative impact on reptiles in the region is currently anticipated. It will be important to implement only the behaviors and precautions required in human-reptile encounters. These issues are detailed in the Biodiversity Action plan.

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

Criterion 1: Refers to Critically Endangered (CR) and /or Endangered (EN) Species. 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. It refers to Endemic and/or Narrowly Ranged Species. It refers to Endemic and/or Narrowly Ranged Species. **Amanos Snake (*Rhynchocalamus*)** , which is endemic to the project site **barani**) is widespread. The distribution area of this endemic species is more than 50,000 square kilometers (km²). is too much. Project area This your species spherical population the size of $\geq 10\%$ And One your species reproductive of unit

It is not possible to say that there is an area that regularly hosts ≥ 10 of them. This According to the available information, the project site **does not meet the threshold value for Criterion 2.**

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*) is **one** of the species widespread in the region. *lynx*) according to IUCN Mediterranean assessment MOST in the category, **Mountain goat (*Capra aegagrus*)** IUCN Mediterranean It is listed in the VU category according to its evaluation. However, the project area remains outside the IUCN Mediterranean evaluation area, the Mediterranean area is generally Aegean, marmara And Mediterrenian regions It covers. This two type spherical in evaluation It is not listed as endangered. However, in this report, these two species need to be taken into consideration . species is acceptance by here evaluation has been made. Moreover in the region **Gray bear (*Ursus arctos*)** and **Striped hyena (*Hyaena hyaena*)** is likely to spread . According to the Mediterranean assessment of both species, the IUCN criterion is VU and they are vulnerable species in the Mediterranean Region.

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. adjacent to the project site high And Cliff in the hills endemic *Dryomys laniger* distribution available. However, it has been evaluated that this species is not present in the project area in terms of habitat structure and altitude. This species is **not affected by the project** .

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 .

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 areas 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 connection also extends across elevation and climate gradients and across crest-to- coast to coast)” also includes biological corridors.

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. Gokcedag The area where RES 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 a large number of 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 150 bird species were identified in the project area and its immediate surroundings. The list of these species, their global Red List status, and the status of the species in BERN, CITES and MAK decisions of 2022 are given in Table 1 below.

5 of the species found around the Gökçedağ WPP site are under threat on a global scale. According to the most current assessments, these species are classified as "EN", that is, endangered Steppe Eagle (*Aquila nipalensis*) and Little vulture (*Neophron percnopterus*) and the turtledove (*Streptopelia*), whose condition is “VU”, meaning sensitive *turtur*), Peregrine falcon (*Falco vespertinus*) and Greater forest eagle (*Clanga clanga*).

Of the species found around the facility, 113 are in BERN Agreement Annex-2, 29 are in BERN Agreement Annex-3, 1 is in CITES Annex-1 and 26 are in CITES Annex-2.

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

Aquila) was detected around the facility and its status was evaluated as "EN". *nipalensis*) and Little vulture (*Neophron percnopterus*) is expected during migration in the region (Kirwan et al., 2008). There are important habitats around the facility for the Little Vulture, which has the possibility of breeding in the areas around the facility. The species is expected to be seen in the facility's region during migration and in the spring and summer months corresponding to the breeding season. This your criterion of the evaluation healthy can be done for in the region A lot Scientific studies aimed at making detailed and population size estimates are required (see Biodiversity Action Plan).

Criterion 2: endemic And Narrow widespread Species for Important habitats

Facility These are the birds around criterion It does not trigger.

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

Gökçedağ RES The site does 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 was vital for sustaining unique or distinctive evolutionary processes. Therefore, none of the habitats around the facility trigger Criterion 5.

Table 1: Bird Species Found or Likely to be Found in the Project Area

Scientific Name	English	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Accipiter brevipes</i>	Levant Sparrowhawk	Not Endemic	LC	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Accipiter gentilis</i>	Northern Goshawk	Not Endemic	LC	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Acrocephalus arundinaceus</i>	Great Reed Warbler	Not Endemic	LC	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Acrocephalus palustris</i>	Marsh Warbler	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Acrocephalus scirpaceus</i>	Reed Warbler	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Aegithalos caudatus</i>	Long-tailed Tit	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Alauda arvensis</i>	Skylark	Not Endemic	LC	APPEN DIX- 3	KD	KD
<i>Alectoris chukar</i>	Chukar Partridge	Not Endemic	LC	APPEN DIX- 3	ANNEX 1	KD
<i>Anthus pratensis</i>	Meadow Pipit	Not Endemic	LC	APPEN DIX- 3	APPEND IX- 2	KD
<i>Anthus spinoletta</i>	Water Pipit	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Anthus trivialis</i>	Tree Pipit	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Apus apus</i>	Common Swift	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Apus pallidus</i>	Pallid Swift	Not Endemic	LC	APPEN DIX- 3	KD	KD
<i>Aquila chrysaetos</i>	Golden Eagle	Not Endemic	LC	APPEN DIX- 2	KD	APPEN DIX- 2

<i>Aquila nipalensis</i>	Steppe Eagle	Not Endemic	MOST	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Ardea cinerea</i>	Grey Heron	Not Endemic	LC	APPEN DIX- 3	ANNEX 1	KD
<i>Ardea purpurea</i>	Purple Heron	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Athene noctua</i>	Little Owl	Not Endemic	LC	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Bubulcus ibis</i>	Cattle Egret	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Buteo buteo</i>	Common Buzzard	Not Endemic	LC	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Buteo rufinus</i>	Long-legged Buzzard	Not Endemic	LC	APPEN DIX- 2	KD	APPEN DIX- 2

Scientific Name	English	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Caprimulgus europaeus</i>	European Nightjar	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Carduelis carduelis</i>	European Goldfinch	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Cecropis daurica</i>	Red-rumped Swallow	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Cercotrichas galactotes</i>	Rufous-tailed Scrub Robin	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Acrocephalus scirpaceus</i>	Reed Warbler	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Chlidonias leucopterus</i>	White-winged Tern	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Chloris chloris</i>	European Greenfinch	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Chroicocephalus ridibundus</i>	Black-headed Gull	Not Endemic	LC	APPEN DIX- 3	ANNEX 1	KD
<i>Ciconia ciconia</i>	White Stork	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Ciconia nigra</i>	Black Stork	Not Endemic	LC	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Circaetus gallicus</i>	Short-toed Snake Eagle	Not Endemic	LC	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Circus aeruginosus</i>	Western Marsh Harrier	Not Endemic	LC	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Circus cyaneus</i>	Hen Harrier	Not Endemic	LC	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Circus macrourus</i>	Pallid Harrier	Not Endemic	NT	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Circus pygargus</i>	Montagu's Harrier	Not Endemic	LC	APPEN	KD	APPEN

				DIX- 2		DIX- 2
<i>Clanga clanga</i>	Greater Spotted Eagle	Not Endemic	VU	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Clanga pomarina</i>	Lesser Spotted Eagle	Not Endemic	LC	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Coloeus monedula</i>	Western Jackdaw	Not Endemic	LC	KD	APPEND IX- 2	KD
<i>Columba livia</i>	Rock Dove	Not Endemic	LC	APPEN DIX- 3	APPEND IX- 2	KD
<i>Columba oenas</i>	Stock Dove	Not Endemic	LC	APPEN DIX- 3	ANNEX 1	KD
<i>Columba palumbus</i>	Common Wood Pigeon	Not Endemic	LC	KD	APPEND IX- 2	KD
<i>Coracias garrulus</i>	European Roller	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Corvus corax</i>	Common Raven	Not Endemic	LC	APPEN DIX- 3	ANNEX 1	KD
<i>Corvus cornix</i>	Hooded Crow	Not Endemic	LC	KD	APPEND IX- 2	KD

Scientific Name	English	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Corvus frugilegus</i>	Rook	Not Endemic	LC	KD	APPEND IX- 2	KD
<i>Coturnix coturnix</i>	Common Quail	Not Endemic	LC	APPEN DIX- 3	APPEND IX- 2	KD
<i>Cuculus canorus</i>	Common Cuckoo	Not Endemic	LC	APPEN DIX- 3	KD	KD
<i>Cyanistes caeruleus</i>	Blue Tit	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Delichon urbicum</i>	Common House Martin	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Dendrocopos syriacus</i>	Syrian Woodpecker	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Egretta garzetta</i>	Little Egret	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Emberiza caesia</i>	Cretzschmar's Bunting	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Emberiza calandra</i>	Corn Bunting	Not Endemic	LC	APPEN DIX- 3	ANNEX 1	KD
<i>Emberiza cia</i>	Rock Bunting	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Emberiza cirrus</i>	Cirl Bunting	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Emberiza hortulana</i>	Ortolan Bunting	Not Endemic	LC	APPEN DIX- 3	ANNEX 1	KD
<i>Emberiza melanocephala</i>	Black-headed Bunting	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Erithacus rubecula</i>	European Robin	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Falco naumanni</i>	Lesser Kestrel	Not Endemic	LC	APPEN	KD	APPEN

				DIX- 2		DIX- 2
<i>Falco peregrinus</i>	Peregrine Falcon	Not Endemic	LC	APPEN DIX- 2	KD	ANNEX 1
<i>Falco subbuteo</i>	Eurasian Hobby	Not Endemic	LC	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Falco tinnunculus</i>	Common Kestrel	Not Endemic	LC	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Falco vespertinus</i>	Red-footed Falcon	Not Endemic	VU	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Ficedula albicollis</i>	Collared Flycatcher	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Ficedula parva</i>	Red-breasted Flycatcher	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Fringilla coelebs</i>	Common Chaffinch	Not Endemic	LC	APPEN DIX- 3	ANNEX 1	KD
<i>Fulica atra</i>	Common Coot	Not Endemic	LC	APPEN DIX- 3	APPEND IX- 2	KD
<i>Galerida cristata</i>	Crested Lark	Not Endemic	LC	APPEN DIX- 3	ANNEX 1	KD

Scientific Name	English	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Garrulus glandarius</i>	Eurasian Jay	Not Endemic	LC	KD	APPEND IX- 2	KD
<i>Grus grus</i>	Common Crane	Not Endemic	LC	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Hieraaetus pennatus</i>	Booted Eagle	Not Endemic	LC	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Hippolais olivetorum</i>	Olive-tree Warbler	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Hirundo rustica</i>	Barn Swallow	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Iduna pallida</i>	Eastern Olivaceous Warbler	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Sylvia communis</i>	Common Whitethroat	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Sitta europaea</i>	Eurasian Nuthatch	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Lanius collurio</i>	Red-backed Shrike	Not Endemic	LC	APPEN DIX- 2	ANNEX 1	KD
<i>Lanius minor</i>	Lesser Grey Shrike	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Lanius nubicus</i>	Masked Shrike	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Lanius senator</i>	Woodchat Shrike	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Larus armenicus</i>	Armenian Gull	Not Endemic	LC	APPEN DIX- 3	ANNEX 1	KD
<i>Larus michahellis</i>	Yellow-legged Gull	Not Endemic	LC	APPEN DIX- 3	ANNEX 1	KD
<i>Linaria cannabina</i>	Common Linnet	Not Endemic	LC	APPEN	KD	KD

				DIX- 2		
<i>Lullula arborea</i>	Woodlark	Not Endemic	LC	APPEN DIX- 3	ANNEX 1	KD
<i>Luscinia megarhynchos</i>	Common Nightingale	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Luscinia svecica</i>	Bluethroat	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Merops apiaster</i>	European Bee-eater	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Milvus migrans</i>	Black Kite	Not Endemic	LC	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Monticola saxatilis</i>	Common Rock Thrush	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Monticola solitarius</i>	Blue Rock Thrush	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Motacilla alba</i>	White Wagtail	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Motacilla cinerea</i>	Grey Wagtail	Not Endemic	LC	APPEN DIX- 2	KD	KD

Scientific Name	English	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Motacilla citreola</i>	Citrine Wagtail	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Motacilla flava</i>	Yellow Wagtail	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Muscicapa striata</i>	Spotted Flycatcher	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Neophron percnopterus</i>	Egyptian Vulture	Not Endemic	MOST	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Oenanthe hispanica</i>	Black-eared Wheatear	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Oenanthe isabellina</i>	Isabelline Wheatear	Not Endemic	LC	APPEN DIX- 2	ANNEX 1	KD
<i>Oenanthe oenanthe</i>	Northern Wheatear	Not Endemic	LC	APPEN DIX- 2	ANNEX 1	KD
<i>Oenanthe pleschanka</i>	Pied Wheatear	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Oriolus oriolus</i>	Eurasian Golden Oriole	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Parus major</i>	Great Tit	Not Endemic	LC	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Passer domesticus</i>	House Sparrow	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Passer hispaniolensis</i>	Spanish Sparrow	Not Endemic	LC	KD	APPEND IX- 2	KD
<i>Passer montanus</i>	Eurasian Tree Sparrow	Not Endemic	LC	APPEN DIX- 3	ANNEX 1	KD
<i>Pastor roseus</i>	Rosy Starling	Not Endemic	LC	APPEN DIX- 3	ANNEX 1	KD
<i>Pelecanus onocrotalus</i>	Great White Pelican	Not Endemic	LC	APPEN	KD	KD

				DIX- 2		
<i>Motacilla citreola</i>	Citrine Wagtail	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Periparus ater</i>	Coal Tit	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Pernis apivorus</i>	European Honey Buzzard	Not Endemic	LC	APPEN DIX- 2	KD	APPEN DIX- 2
<i>Petronia petronia</i>	Rock Sparrow	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Phalacrocorax carbo</i>	Great Cormorant	Not Endemic	LC	APPEN DIX- 3	APPEND IX- 2	KD
<i>Phoenicurus ochruros</i>	Black Redstart	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Phoenicurus phoenicurus</i>	Common Redstart	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Phylloscopus collybita</i>	Common Chiffchaff	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Phylloscopus orientalis</i>	Eastern Bonelli's Warbler	Not Endemic	LC	APPEN DIX- 2	KD	KD

Scientific Name	English	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Phylloscopus sibilatrix</i>	Wood Warbler	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Phylloscopus trochilus</i>	Willow Warbler	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Pica pica</i>	Eurasian Magpie	Not Endemic	LC	KD	APPEND IX- 2	KD
<i>Picus viridis</i>	European Green Woodpecker	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Poecile lugubris</i>	Sombre Tit	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Prinia gracilis</i>	Graceful Prinia	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Prunella modularis</i>	Dunnock	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Ptyonoprogne rupestris</i>	Eurasian Crag Martin	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Remiz pendulinus</i>	Eurasian Penduline Tit	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Riparia riparia</i>	Sand Martin	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Saxicola rubetra</i>	Whinchat	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Saxicola rubicola</i>	European Stonechat	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Serinus serinus</i>	European Serin	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Sitta neumayer</i>	Western Rock Nuthatch	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Streptopelia decaocto</i>	Eurasian Collared Dove	Not Endemic	LC	APPEN	ANNEX	KD

				DIX- 3	1	
<i>Streptopelia turtur</i>	European Turtle Dove	Not Endemic	VU	APPEN DIX- 3	APPEND IX- 2	KD
<i>Sturnus vulgaris</i>	Common Starling	Not Endemic	LC	KD	ANNEX 1	KD
<i>Sylvia atricapilla</i>	Eurasian Blackcap	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Sylvia communis</i>	Common Whitethroat	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Sylvia crassirostris</i>	Arabian Warbler	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Sylvia curruca</i>	Lesser Whitethroat	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Sylvia melanothorax</i>	Cyprus Warbler	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Sylvia rueppelli</i>	Rüppell's Warbler	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Tachymarptis melba</i>	Alpine Swift	Not Endemic	LC	APPEN DIX- 2	KD	KD

Scientific Name	English	endemism	IUCN (Spherical)	BERN	MAKK	CITES
<i>Troglodytes troglodytes</i>	Eurasian Wren	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Turdus merula</i>	Common Blackbird	Not Endemic	LC	APPEN DIX- 3	APPEND IX- 2	KD
<i>Turdus philomelos</i>	Song Thrush	Not Endemic	LC	APPEN DIX- 3	APPEND IX- 2	KD
<i>Turdus torquatus</i>	Ring Ouzel	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Turdus viscivorus</i>	Mistle Thrush	Not Endemic	LC	APPEN DIX- 3	ANNEX 1	KD
<i>Upupa epops</i>	Eurasian Hoopoe	Not Endemic	LC	APPEN DIX- 2	KD	KD
<i>Vanellus vanellus</i>	Northern Lapwing	Not Endemic	NT	APPEN DIX- 3	ANNEX 1	KD

1.6 Biodiversity Risk Evaluation

1.6.1 Flora

IFC PS-6 and Guidance in the facility area No plant taxon with CR and EN status that complies with Note 6 criteria was found. Therefore, there is no critical habitat hosting these taxa .

➤ 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 (Table 2). biodiversity The 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, in order 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 2: Invasive Species Present or Likely to Be Present in the Project Area

<i>Acer negundo</i> (ash tree leafy maple) Areas open to andropogenic influence	
<i>Agropyron repens</i> (Separate herb) Field, open area	
<i>Ailanthus altissima</i> (Kokarağaç) andropogenic to the effect open spaces	
<i>Amaranthus retroflexus</i> (Fox dry) Field, open area	

Boreava orientalis (Sariat) Field, roadside



chenopodium album (While crying) Flood, flood bearings



Cirsium arvense (Köygöçüren) Flood, flood bearings



conyza canadensis (cypress) andropogenic to the effect open fields



Conyza bonariensis (Coyote) andropogenic to the effect open fields



Conyza albida (Maplewort) andropogenic to the effect open spaces



Cuscuta campestris (Turkish) meadow-pasture habitats



Lepidium draba (Diġnik) andropogenic to the effect open spaces



nasturtium officinale (Suteresi) streamside



Reseda lutea (Love flower) Path edge, field



rumex acetocella (Sorrel) Path edge, field And barren places



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

Paspalum distichum (This discrete) This communities inside on channels



Robinia pseudoacacia (White flowering liar acacia) roadsides



Xanthium strumarium (Big Pitarak) Flood, flood bearings



Xanthium spinosum (Yellow Pitarak) Flood, flood bearings



Viscum album (Lime herb) to the trees interference



1.6.2 Fauna

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

Amanus snake (*Rhynchocalamus* Risk Assessment for *barani*) : Currently, no ongoing risk is foreseen for the species during the operation phase. But human-snake encounters are always possible. In these cases, it is very important to recognize the species and never harm it. There is also an Amanos crossing the roads while driving in the area. snake with when encountered definitely to the snake transition priority to give And aware In order not to cause snake crushes, the maximum vehicle speed on the roads should always be 30 It is important to apply it in km/hour.

Tortoise (*Testudo graeca*) : This species has been seen in previous observations around the area. Its presence in the region has been assessed sparsely. Currently, no ongoing risk to the species is foreseen during the operation phase. However human-turtle encounters are always possible. In these cases, recognition of the species and never damage not given A lot It is important. Moreover in the field vehicle on their rides ways passing by When encountering a tortoise, it is important to give priority to the animal and to ensure that the maximum vehicle speed on the roads is always 30 km/h in order to avoid accidentally crushing the tortoise .

Lynx Risk Assessment for 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. It is unlikely that the animal will be negatively affected by a RES facility due to its lifestyle. It doesn't seem possible. Although it moved away from the area to some extent due to human activity and noise only during the construction period, the species is expected to use the area again since human mobility and facility-related noise are at a minimum level in the current operation phase. continue to do strong It is probable. 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.

Mountain goat (*Capra aegagrus*) : The project area and its surroundings contain very suitable habitats for the species. Available due to the animal's lifestyle and mobility from the facility negative is affected by is It is not expected. However especially with facility Some actions have been suggested in the Biodiversity action plan against the risks of falling into the relevant water channels, frightening the facility's vehicles and people working in the facility.

Brown bear (*Ursus arctos*) : The general structure of the project site seems suitable for the species. It is possible to find bears in the Amanos from time to time, albeit rarely. There is no direct risk to the species during the operation phase.

Striped hyena (*Hyaena Risk Assessment for hyaena*) : Striped hyena in Hatay province It is one of the provinces where it is seen abundantly . The only protected area created for the striped hyena in Turkey is in Hatay province. The species can pass through the Amanos Mountains and reach Adana, Osmaniye and Kahramanmaraş regions. They are likely to use the project site. There is no direct risk to the species during the operation phase.

1.6.3 Ornithology

IFC PS-6 and Guidance Considering the Note 6 criteria, “critical type” evaluation and “critical habitat” assessment in chapter 5 made is, in the region birds in terms of There is a critical species. This species is the Lesser Vulture (*Neophron percnopterus*) . Attention should be paid to the actions provided in the Biodiversity Action Plan for the species in question.

1.6.4 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,
- weather 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 3 .

Table 3 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. Regarding the issue dated 26.06.2021 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	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; 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.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".
		Medical Wastes	For medical waste generated within the scope of the activity; waste at the source -most member will download system establishment 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, 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.
		Waste Electronic Things	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.
		Waste oils	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

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 06.06.2015 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 .
		Tires that Completed its life	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.

At the facility, care should be taken to store waste scrap materials on a concrete floor rather than on a dirt floor.

wastewater generated within the scope of the project was collected in the septic tank and disposed of with a sewage tank. In this context, within the scope of domestic wastewater generated during the operation phase , the provisions of the "Water Pollution Control Regulation", which came into force after being published in the Official Gazette No. 25687 dated 31.12.2004, must be complied with. In addition, the provisions of the Water Pollution Control Regulation and the Regulation on the Protection of Drinking and Domestic Water Basins must be complied with during the operation.

It has been determined that the project is outside the scope of the Environmental Permit and License Regulation, and no exemption certificate has been found. The facility's Environmental Permit Exemption certificate must be kept within the scope of the Environmental Permit and License Regulation.

1.7 Social Responsibility Suggestions

Social responsibility projects are the expression of the investor company's sensitivity to biodiversity . Starting from this point, the cultivation of endemic bulbous plants in Osmaniye province, which are our most important resource values, will be one of the good examples of these sensitivities (Table 4).

Table 4 Sensitive and Rare Endemic Bulbous Plant Recommendations for Gökçedağ WPP in Osmaniye Province

Herb taxon	Turkish First Name	Blooming	habitat
<i>allium gay</i>	small onion	4- 5	Cliff slopes, Sandy Oak and Juniper Fields, Fallow Fields
<i>allium flavum</i> subsp . <i>tauricum</i> there is. <i>pilosum</i>	taurus yellow	6- 6	Dry Top surfaces, Rock Hills, Bushes
<i>allium phaneranthemum</i> subsp . <i>deciduum</i>	Kelkörmən	6- 8	Pine, Beech, Oak, Cedar forests, cliffs, calling
<i>allium karamanoglui</i>	Pasasogani	4- 4	Dry slopes, shrubs
<i>fritillaria alfredae</i> subsp . <i>glaucoviridis</i>	agelale	4- 5	Oak bushes, maquis
<i>crocus danfordiae</i> subsp . <i>danfordiae</i>	incecigdem	2- 3	Top openings, shrubs
<i>crocus adanensis</i>	Adanaçiğdemi	3- 3	of the woods Between, Juniper, Oak Scrubs
<i>crocus leichtlinii</i>	Mardinçiğdemi	3-4	Cliff slopes
<i>gladiolus anatolicus</i>	wildflower	3- 5	Maki, Pine forest, Limestone Places

, the medicinal and aromatic plants mentioned in Table 5 , which have economic value, can be produced in a 50 m ² polyethylene greenhouse (turned from seed to seedling) to be established within the facility site, and a medicinal and aromatic plant garden can be established in the fields of the local people. This action, which has economic returns, will also be an approach compatible with the understanding of sustainable biodiversity . This area can be improved by adding species every year.

Table 5 Production can be done Medical And Aromatic plants

Herb taxon	Turkish First Name
<i>Salvia officinalis</i>	Medical Sage
<i>Echinacia purpurea</i>	echinacea
<i>Echinacia angustifolia</i>	echinacea
<i>Origanum onites</i>	Izmir thyme
<i>Thymus vulgaris</i>	Mountain thyme
<i>Mentha piperita</i>	menthol Mint
<i>achillea millefolium</i>	Civan forelock
<i>calendula officinalis</i>	Same Sefa
<i>Melissa officinalis</i>	Balm
<i>lavandula angustifolia</i>	Lavender
<i>Rosmarinus officinalis</i>	Rosemary
<i>hypericum perforatum</i>	Yellow Centaury
<i>urtica dioica</i>	Nettle
<i>helichrysum Sp.</i>	Gold weed

1.8 biodiversity Action plan

Gokcedag RES facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
GD1	All Habitats	Critical Conservation of Fauna Species	General Area	Endangered Fauna types His research particularly focused on the Lesser Vulture (<i>Neophron Percnopterus</i>) With Steppe Eagle (<i>Aquila nipalensis</i>) Species in the Project Area and Surroundings It should be investigated	Population by Expert Biologists Level Monitoring	During Operation	2 Year Duration: March-November Between
GD2	All Habitats	Critical Conservation of Fauna Species	General Area	Amanus Snake (<i>Rhynchocalamus Barani</i>) Species Should be Investigated in the Project Area and Surroundings About Facility Employees Should Be Provided Training	Population by Expert Biologists Level Monitoring	During Operation	In May-June for 1 Year
GD3	Business	Fauna Conservation of Species	Project Area And surroundings	Tortoise (<i>Testudo</i> Facility Employees Should Be Provided Training About <i>Graeca</i>) Species. Pay Attention to Certain Points of the Project Area Tortoise may come out signs It must be placed.	Biologists who are experts on the subject Training Should Be Provided by	During Operation	April-May 2024 one Times

Gokcedag RES facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
GD4	Business	Fauna Conservation of Species	Project Area And surroundings	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
GD5	Business	Fauna Conservation of Species	Project Area And surroundings	Lynx About the Lynx) Species Facility To its employees Education should be given	Biologists who are experts on the subject By Education should be given	During Operation	April-May 2024
GD6	Business	Fauna Conservation of Species	Project Area And surroundings	in the region Bear (<i>Ursus Arctos</i>) is available. Human-Bear Encounters Can Sometimes Be Dangerous. bears To the region Garbage containing food should never be left open in the facility to avoid shrinkage. A Garbage Management plan How to Prepare and Store and Remove Garbage That May Attract Bears About APPLICATION It must be reported.	Company By	During Operation	Continually

Gokcedag RES facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
GD7	Business	Fauna Conservation of Species	Project Area And surroundings	Pet Cats Should Never Be Kept 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
GD8	All Habitats	Invader Blocking Species	Project Area And surroundings	Investigation of Invasive Species Found in the Project Area and Surroundings Project Area And Around by watching dismantling of your plan Must be prepared	Population by Expert Biologists Level Monitoring	During Operation	one Year Duration in July and August
GD9	Business	Prevention of Environmental Pollution	Project Area	Licensed in accordance with the Waste Codes for Hazardous Wastes Generated within the Business Companies Recycling /Disposal by to its facilities Must be Delivered .	Company By	During Operation	6 on the moon one
GD10	Business	Prevention of Environmental Pollution	Project Area	Licensed in accordance with the Waste Codes for Non-Hazardous Wastes Generated within the Business Companies Recycling /Disposal by to its facilities Must be Delivered .	Company By	During Operation	per year one

GD11	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

Gokcedag RES facility biodiversity Action plan							
Action Code	Habitat Class	Action Subject	Action Zone	Action Rationale	Action/Application Details	Action Period	Action Duration
GD12	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	