Photograph II.3. 58. *Stephanolepis diaspros*

Within the scope of the fieldwork, within the area of Ceyhan Energy Specialized Industrial Zone Raw Material Supply, Storage and Port Facility Project, fish species were identified by catching and observation during the examinations made in the marine area (see Table II.3.5). In addition, the vertebrate species whose existence in the area were determined by fishing are also given. Most of the detected species are of economic importance.

Within the activity area, there is no productive area that is frequently used as a feeding, nesting and sheltering area for fish, but there are suitable areas around it. Therefore, the project boundaries are not used effectively in terms of aquaculture production. However, the project area and its area of influence are used as hunting grounds by fishermen from time to time.

International agreements and practices, on the other hand, are generally about the flora and fauna elements that are under protection, cross-border and/or migratory and their habitats, and aim to protect the regions where these creatures and/or their habitats are found. Institutions such as UN FAO, UNEP, EU, IUCN are among the institutions that carry out binding studies on protection and use details. The criteria established to protect these creatures and their habitats should be taken into consideration.

Although they are under protection, these creatures have the ability to move at very high speeds and have the potential to leave the area in adverse conditions. The species in question use this area only as a feeding and crawling area. In this case, they are not expected to be adversely affected by the facility. Though, it has been observed that the fish species diversity in the area is high..

According to the physical measurement values and general observations in the sea area of the facility activity area, it is seen that the environment has a clean water characteristic and its biological diversity is at a moderate level. All identified organisms and fish contain common and abundant species of the Mediterranean.

Fish species are organisms that have the ability to avoid/move away from negative effects. Turbidity moves away from the environment where water temperature and other chemical changes occur. With all the information gathered, it is understood that the facility will not have a significant impact on the fish species and fishing activities of the region.

In the marine impact area of the Project, besides the rocky areas, there are predominantly sand habitats and mobile invertebrates in this area. Vertebrates have the ability to move away from the environment when adverse conditions increase. In this respect, it is understood that the effect of the project is minimal..

It is considered that the Project Port activities will not create a significant pressure on the fish species determined in the area.

II.3.5. SPECIES THAT ARE UNDER THREAT IN THE PROJECT AREA

The IUCN - Threatened Species Red List (IUCN 2021 ver.3) is recognized as the most effective list of globally threatened species (Lamoreux et al., 2003; Rodrigues et al., 2006). The IUCN Red List Criteria categorize species using simple quantitative rules based on population sizes and population declines.

In the updated version of the "List of Endangered Species", the 8 marine species listed below have been evaluated in the "Critically Endangered" or "Endangered" categories. Two of them were observed in the field studies, and the remaining six are given according to the literature (Table II.3.6).

Table II.3. 6. List of Endangered Species Found in the Project Area

Family	**Species**	**IUCN Red List**	**Observation/Literature**
Lamnidae	*Isurus oxyrinchus*	CR	Observation
Myliobatidae	*Aetomylaeus bovinus*	CR	Literature
Gymnuridae	*Gymnura altavela*	CR	Literature
Rajidae	*Raja radula*	EN	Literature
Rhinobatidae	*Rhinobatos rhinobatos*	EN	Observation
Anguillidae	*Anguilla anguilla*	CR	Literature
Epinephelidae	*Epinephelus marginatus*	EN	Literature
Phocidae	*Monachus monachus*	CR	Literature

The critical species whose distributions were determined in the marine area of the project also show a wide distribution in the Mediterranean. Therefore, the marine areas that these species can use as alternatives are observed in the Aegean coasts of our country, starting from the entire Eastern Mediterranean. These seven critical species can be observed not only in the project area, but also in a wide area on the Aegean and Mediterranean coasts. Therefore, even considering that these species are affected by the project, the entire Mediterranean basin should be considered as alternative habitats (Figure II.3.4)..

Also, the impact of the pier to be created within the scope of the project on the marine ecosystem will be at such a low level that it does not go beyond the marine license area and has been evaluated within a zone impact area of approximately 1 km after the pier areas (Figure II.3.5).

Figure II.3. 4. Alternative Distribution Areas of Critical Species Found in the Project Area

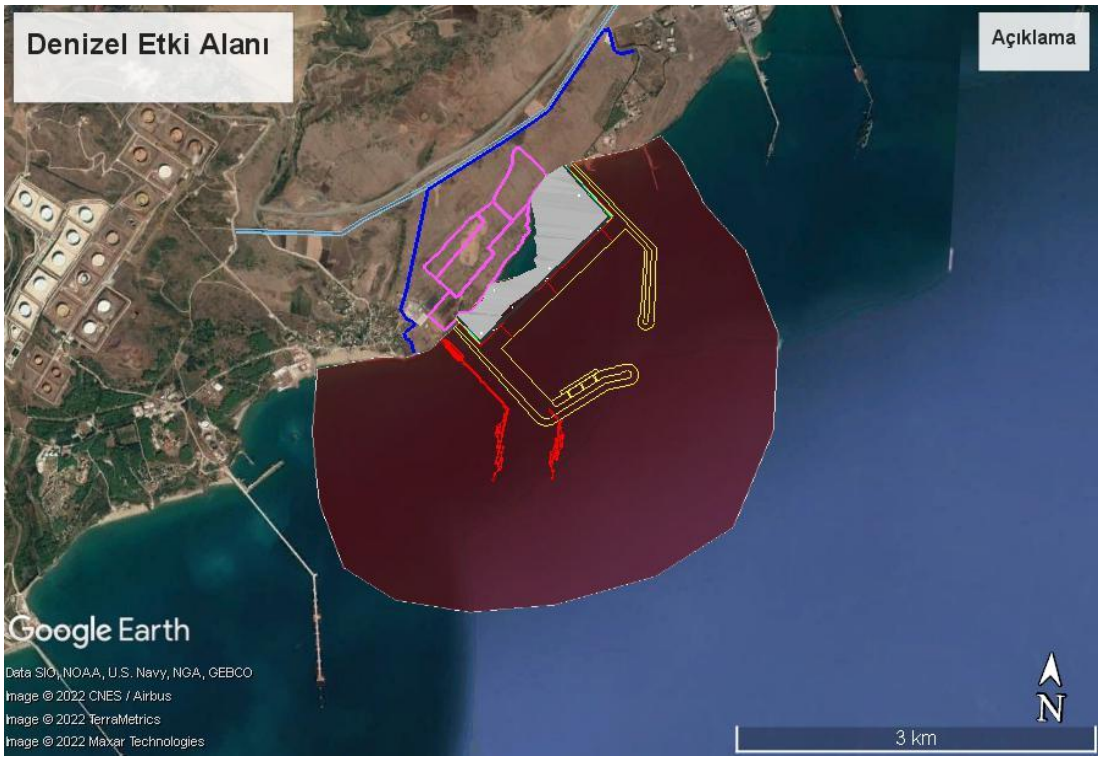


Figure II.3. 5. Area of Influence of Activities in the Project Marine Area

II.3.6. SPECIES PROTECTED UNDER THE BERN AND BARCELONA CONVENTIONS

The Bern Convention on the Conservation of European Wildlife and Natural Habitats (known as the Bern Convention) came into action on 1 June 1982. They aim to protect wild flora and fauna species and habitats, and to protect endangered and vulnerable species, requiring cooperation between various states. Particular emphasis is placed on habitat protection, including migratory species within the conventions. Parties should take appropriate legislative and administrative measures to protect the habitats of fauna and flora species, in particular those specified in Annexes I and II, which include 91 marine species. Parties should also ensure that their planning and development policies do not damage critical habitats and pay special attention to the protection of areas important for migratory species listed in Annexes II and III.

The Barcelona Convention, Special Protected Areas and Protocol on Biodiversity are in the main texts of the Mediterranean to implement the Convention on Biological Diversity (Rio de Janeiro, 1992) with regard to the sustainable management of Mediterranean coastal and marine biodiversity in situ. The Contracting Parties agreed to cooperate to protect and restore the health and integrity of ecosystems and to have common but differentiated responsibilities in this regard. Appendix II of the protocol lists endangered or threatened species. Parties should ensure the highest possible protection and recovery of fauna and flora species listed in Annex II. Parties should also prohibit destruction and damage to habitats of species listed in Annex II. Appendix II lists 105 marine species, 20 of which have been recorded from the Mediterranean coast.

II.3.7. HABITAT (BIOTOPE) ASSESSMENT

II.3.7.1. Habitats Exclusive to the Mediterranean

Red List assessments were made for 47 benthic habitats in the Mediterranean. Forty-nine percent (23 habitats) in the EU28 and 60% (28 habitats) in the EU28+ have Data Deficiency status. Of the 24 remaining habitats in the EU28, 63% (15 habitats) are threatened to some degree. They are also highly threatened (74.14% habitat) in EU28+ (Table II.3.7). The most frequently quoted threats are; pollution, fishing, urbanization, invasive alien species and climate change.

On the coastline, coastal protection programs and development projects such as marina construction, urban and tourism infrastructure have changed hydrographic conditions. In

shallow waters, the spread of invasive and non-native macroalgae such as *Caulerpa racemosa* is the most significant threat, and habitat loss of seagrass meadows such as *Posidonia* due to seabed trawling is also a major problem. Eutrophication from nutrient discharges in agricultural areas is a more widespread and significant pressure, and climate change is already affecting some mediolittorals (i.e., tidal exposed coastlines in marine areas with a small tidal range such as the Mediterranean) and infralittoral habitats. Sediment habitats are particularly subject to physical disturbance from forced hunting activities such as bottom trawling and dredging. This has seriously changed the nature of some habitats. The persistence and prevalence of these pressures is a significant threat to benthic habitats of the Mediterranean.

Table II.3. 7. Habitat Types Detected in the Mediterranean (Gubbay et al., 2016)

EUNIS CODE	Habitat type	EU28 Category	EU28+ Category	EU28 Criteria	EU28+ Criteria
A1.13	Mediterranean upper mediolittoral rock assemblages	LC	DD	-	-
A1.14	Exposed Mediterranean mediolittoral rock assemblages	NT	DD	A1	-
A1.23	Rock assemblages just above the waterline	DD	DD	-	-
A1.34	Rock assemblages unaffected by waves and tides located just above the Water Level	LC	DD	-	-
A1.41	Pool areas between cliffs just above the Water Level	DD	DD	-	-
A1.44	Mediterranean coastal medio caves and ledge communities	DD	DD	-	-
A2.12	Mediterranean mediolittoral coarse sediment estuary assemblages	DD	DD	-	-
A2.13	Mediterranean mediolittoral coarse sediment assemblages	DD	DD	-	-
A2.25	Sand dunes affected by wave action just above the Waterline	VU	VU	A1, A2ab	A1, A2ab
A2.31	Mediterranean communities mediolittoral mud estuary	EN	EN	A1, A2ab	A1, A2ab
A2.33	Mediterranean mediolittoral mud assemblages	VU	VU	C/D1	C/D1
A2.42	Mediterranean mediolittoral mixed sediment assemblages	DD	DD	-	-
A2.7x	Biogenic habitats of Mediterranean mediolittoral rocks	VU	VU	B2a,b	B2a,b, C/D2
A3.13	Photophilic assemblages with shade-forming algae in Mediterranean infralittoral and upper circalittoral rocks	EN	DD	A1, A2b	-
A3.1x	Algal communities that live attached to rocks in areas from the sea surface to the depth where the light disappears	DD	DD	-	-
A3.23	Photophilous communities dominated by calcareous, habitat-forming algae	VU	VU	B2b	B2b
A3.36	Mediterranean estuarine rock assemblages	VU	VU	A1, C/D1	A1, C/D1
A4.23	Mediterranean soft interurban rock assemblages	VU	VU	A1, A2a, C/D1	A1, A2a, C/D1
A4.27	Mediterranean communities sub-urban rock	DD	DD	-	-
A4.2x	Circalittoral biogenic habitats in the Mediterranean - worm reefs	DD	DD	-	-
A4.71	Mediterranean circalittoral wineries and floodplain communities	LC	LC	-	-
A5.13	Faunal assemblages and Mediterranean infralittoral coarse sediment	DD	DD	-	-
A5.14	Mediterranean upper circalittoral coarse sedimentary assemblages	DD	DD	-	-

EUNIS CODE	Habitat type	EU28 Category	EU28+ Category	EU28 Criteria	EU28+ Criteria
A5.15	Mediterranean assemblages sub-urban coarse sediments	DD	DD	-	-
A5.23	Fine sand dunes in the sea and fauna communities using these areas	DD	DD	-	-
A5.25	Mediterranean circalitoral communities contain well-ordered fine sands.	DD	DD	-	-
A5.25x	Mediterranean communities very shallow circalittoral fine sands	NT	NT	C/D1	C/D1
A5.27	Mediterranean communities lower calcareous sands	VU	VU	C/D1	C/D1
A5.28	Muddy areas in the sea and fauna communities using them	DD	DD	-	-
A5.32	Mediterranean sublittoral estuarine sedimentary assemblages	VU	VU	A1, C/D1	A1, C/D1
A5.38	Mediterranean infralittoral muddy detrital bottoms assemblages	VU	VU	C/D1	C/D1
A5.38x	Muddy detrital bottoms of the Peri-Mediterranean Communities	DD	DD	-	-
A5.39	Mediterranean infralittoral (coastal) regional mud communities	NT	NT	C/D1	C/D1
A5.46	Mediterranean upper circalittoral coastal detrital bottoms assemblages	DD	DD	-	-
A5.47	Mediterranean sub-urban (shelf edge) detrital bottoms or offshore detrital bottom assemblages	DD	DD	-	-
A5.51	Rhodolith deposits in the Mediterranean	DD	DD	-	-
A5.52A	Algal dominant communities in the Mediterranean interurban sediment	DD	DD	-	-
A5.52B	Algal dominant communities in the Mediterranean infralittoral sediment	EN	EN	A1	A1
A5.53	Seagrass beds on Mediterranean infralittoral sand (except Posidonia)	LC	LC	-	-
A5.535	Posidonia deposits in the Mediterranean infralittoral region	VU	VU	A1	A1
A5.5x	Mediterranean infralittoral coastal detrital bottom assemblages	NT	NT	C/D1	C/D1
A5.61	Polychaete worm reefs in the Mediterranean infralittoral region	DD	DD	-	-
A5.6v	Mediterranean infralittoral mussel beds	EN	EN	A3	A3
A5.6x	Infralittoral biogenic habitats in the Mediterranean - coral bio-attributes	NT	DD	A1, A2ab, C/D1	-
A5.6y	Circalittoral biogenic habitats in the Mediterranean - coral biofortresses	DD	DD	-	-
A5.6w	Mediterranean infralittoral oyster beds	EN	EN	A3	A3
A5.6z	Circalittoral biogenic habitats in the Mediterranean - oyster beds	DD	DD	-	-

According to the current results, the most threatened habitats occur in estuary environments. Habitats in infralittoral and mediolittoral environments are classified as Vulnerable or Endangered. (Table II.3.8). These include algal-dominated assemblages, mussel and oyster beds, as well as sacilittoral sediments and rocks in infralittoral sediments.

In both the EU28 and the EU28+, the most frequently assessed criteria for threatened habitats was A1, with reduced criteria and declining quality as C/D1. These assessments were created using either quantitative data or expert opinion to conclude whether there have been significant reductions in habitat level and that habitat loss will continue substantially in the near future. Only two habitats were considered threatened according to the B2 criterion. These are habitats of endemic dominant structural species; Biogenic habitats of Mediterranean mediolittoral rocks represented by Mediterranean barren molluscs and red algae such as *Lithophyllum byssoides* and *Neogoniolithon brassica-florida* (A2.7x) and Photophilic communities when calcareous, habitat-forming algae (A3.23) was predominate.

Table II.3. 8. Threatened Marine Habitats of the Mediterranean (Gubbay Et Al., 2016)

EN	ENDANGERED (EN)
A2.31	Mediterranean communities mediolittoral mud estuary
A3.13	Photophilic assemblages with shade-forming algae in Mediterranean infralittoral and upper circalittoral rocks
A5.52B	Algal dominant communities in the Mediterranean infralittoral sediment
A5.6v	Mediterranean infralittoral mussel beds
A5.6w	Mediterranean infralittoral oyster beds
VU	VULNERABLE (VU)
A2.25	Sand dunes affected by wave action just above the Waterline
A2.33	Mediterranean mediolittoral mud assemblages
A2.7x	Biogenic habitats of Mediterranean mediolittoral rocks
A3.23	Photophilous communities dominated by calcareous, habitat-forming algae
A3.36	Mediterranean estuarine rock assemblages
A4.23	Mediterranean soft interurban rock assemblages
A5.27	Mediterranean communities lower calcareous sands
A5.32	Mediterranean sublittoral estuarine sedimentary assemblages
A5.38	Mediterranean infralittoral muddy detrital bottoms assemblages
A5.535	Posidonia beds in the Mediterranean infralittoral region

II.3.7.2. Marine Habitat Structure of the Project Area

When the habitat structure of the marine area of the project area is examined, different soil structures and the biological life associated with them are observed. The dominant habitat in coastal areas is sandy ground structure. As you move away from the shore, the mud soil structure becomes dominant.

It has been determined that the first 400 - 600 meters (depth: 5 - 6 meters) of the marine environment, together with the rear coast and the inner coast (tidal zone), in the area where the activity area is located and in its immediate vicinity, is in the "sandy bottom" habitat type.

It has been determined that the coastal rock habitat type is found in the parts of the sandy floor that corresponds to the rocks in the terrestrial region..

In the field studies, after the sand bottom habitat, the field studies were terminated, and habitat type at a distance of 3 km from the shore and up to a depth of approximately 14 meters was determined as a mud habitat type.

Among the habitats defined above, there are well-arranged fine sands of the Mediterranean circalittoral communities with the code A2.25 Eunis as a habitat structure to be protected within the coastal areas of the project area (Table II.3.9). Based on the opinions of experts and population trends in the last 50 years; In Spain, France, Italy and Greece there appears to be a decrease of at least 30% in this habitat level. Considering the ongoing coastal developments and pressures, an overall decrease of 30-40% is estimated in the recent, present and near future. Therefore, this habitat has been assessed as “Vulnerable” under EU 28 and EU 28+ criteria A1, A2a and A2b.

Table II.3. 9. Marine Habitats Observed in the Project Area

ENUIS CODE	Name of Habitat Type	EU28 Category	EU28+ Category	EU28 Criteria	EU28+ Criteria
A1.23	Rock assemblages just above the waterline	DD	DD	-	-
A1.34	Rock assemblages unaffected by waves and tides located just above the Water Level	LC	DD	-	-
A1.41	Pool areas between cliffs just above the Water Level	DD	DD	-	-
A2.25	Sand dunes affected by wave action just above the Waterline	VU	VU	A1, A2ab	A1, A2ab
A3.1x	Algal communities that live attached to rocks in areas from the sea surface to the depth where the light disappears	DD	DD	-	-
A5.23	Fine sand dunes in the sea and fauna communities using these areas	DD	DD	-	-
A5.28	Muddy areas in the sea and fauna communities using them	DD	DD	-	-

An ecosystem is considered “Vulnerable” when it meets any of the criteria A to E. Therefore, it is considered to be at a high risk of collapse.

The following criteria are used for habitat assessment: Trend (criterion A2b) in the last 50 years (Trend A1), future (in the next 50 years) (criterion A2a), any 50-year period (including past, present and future). Quality trend (C/D1) and Long-term historical decline (criterion A3) over the last 50 years. Restricted geographic composition (criterion B) was decisive in only a relatively small number of cases, and quantitative analysis (criterion E) was used only once to assess the probability of population collapse.

In the field application, the terrestrial habitat structure of the coastal area and the distribution of habitats were evaluated and it was determined that the coastal region had a "low coast" structure consisting of rocky areas (Photo II.3.59).

Photograph II.3. 59. Coastal and Marine View of the License Area

When the marine biotope structure of the study area was evaluated, different soil structures and the existence of biological life models associated with them were observed. There are more and more different habitat types from coastal to open areas. The dominant biotope in coastal areas is rocky ground. In addition, large pebbly soils and sandy areas occupy a very limited space in this biotope. The rocky habitat is dominant in the region that reaches 15-20 meters from the coast at some points and has a very rich biological diversity. As you move away from the shore, the sandy ground structure becomes dominant. Apart from the sand areas, the mud ground structure covering the whole region and the presence of mud biotope are observed in the deeper parts.

II.3.7.2.1. Rock assemblages just above the waterline (Eunis Code: A1.23)

This habitat consists of bedrock, rock and stone areas in the mediolittoral of the Mediterranean coast. The related species are adapted to prolonged periods of eruption. The main species in the upper mediolittoral are crabs, snails and limpets. In the lower part of this habitat, algae form the dominant species (Photo II.3.60).

This habitat constitutes the most dominant habitats of the project coastal zone and therefore there are some protected areas in the Mediterranean although not subject to specific protection measures. More work is needed to identify measures to protect this habitat.

Photograph II.3. 59. Rock assemblages just above the water level at the project site

II.3.7.2.2. Rock assemblages unaffected by waves and tides located just above the Water Level (Eunis Code: A1.34)

This habitat is found in the underlying mediolittoral rock section in areas protected from wave effects and currents. However, some of the related species may thrive on moderately current coasts. The rock surfaces are covered with characteristic species of moss, depending on local conditions. In areas with slight horizontal slopes, red algae can form an almost continuous carpet. Brown algae can be found on smooth rocky shores with medium or low wave action, and in nutrient-rich areas green algae of the genus *Ulva* dominate and can form a foothold for other algae species to settle (Photo II.3.61).

This habitat is abundant and widely distributed along the Mediterranean coast. However, research and monitoring has been carried out in only a few regions and there are no reports of trends in this habitat disappearing from individual countries. The extent of damage specifically for this sheltered rocky habitat is unknown.

Photograph II.3. 61. Rock assemblages that are not affected by waves and tides located just above the water level in the Project site

II.3.7.2.3. Pool areas between cliffs just above the Water Level (Eunis Code: A1.41)

This habitat is found in the intertidal zone and forms discrete patches along the Mediterranean coast. It is structured by a complex set of physical and biological factors that create the variability of rock pools (Photo II.3.62). Knowledge of its distribution in the Mediterranean is limited to the few studies that provide data on the structure of communities in this habitat. While habitat may be affected by anthropogenic developments in the intertidal and shallow coastal region, communities have adapted to rapidly changing conditions and may be highly resilient to such influences. With that being said, recovery capacities depend on the characteristics of different rock pools. The main pressures are pollution from marine and terrestrial activities and habitat change from coastal development. Because rock pools are located at the land and sea interface, macroalgal communities are also expected to be strongly affected by climate change and the combined effects of high CO2 and temperature. Conservation and management measures that will benefit this habitat are mostly general rather than specific measures. It includes pollution control and regulation, development control. More studies are needed to know its exact distribution and conservation status in the Mediterranean.

Rock pools occur where coastal topography allows seawater to remain in depressions in the bedrock. As the communities involved are constantly submerged, they are not directly affected by the height at the shore and normal rocky shore formation models do not apply. Factors such as pool depth, surface area, volume, orientation to sunlight, shading, interior topography, sediment content and type, wave exposure, shore height and hence wash rate and absence of freshwater runoff have major consequences. The passage of seawater in this habitat can be completely interrupted by prolonged calm sea conditions. In these cases, the habitat may face significant changes in temperature, pH, salinity, and oxygen concentration. Nitrogen concentration is very high and seasonal changes occur more than in adjacent, regularly enclosed communities. In these conditions, the development of macroalgal communities is inhibited and green algae may become dominant. Numerous benthic species and juvenile stages of some commercial fish species can also be found in rock ponds.

Photograph II.3. 60. Pool areas between cliffs just above the Water Level

II.3.7.2.4. Sand dunes affected by wave action just above the Waterline (Eunis Code: A2.25)

This habitat is represented, with little movement, in the region between the almost dry supralittoral sands and the permanently submerged infralittoral sands of the Mediterranean beaches. Coarser sediments are often found on beaches subject to stronger waves, while fine sediments are common on much more sheltered coasts. Polychaetes, oligochaetes, amphipods

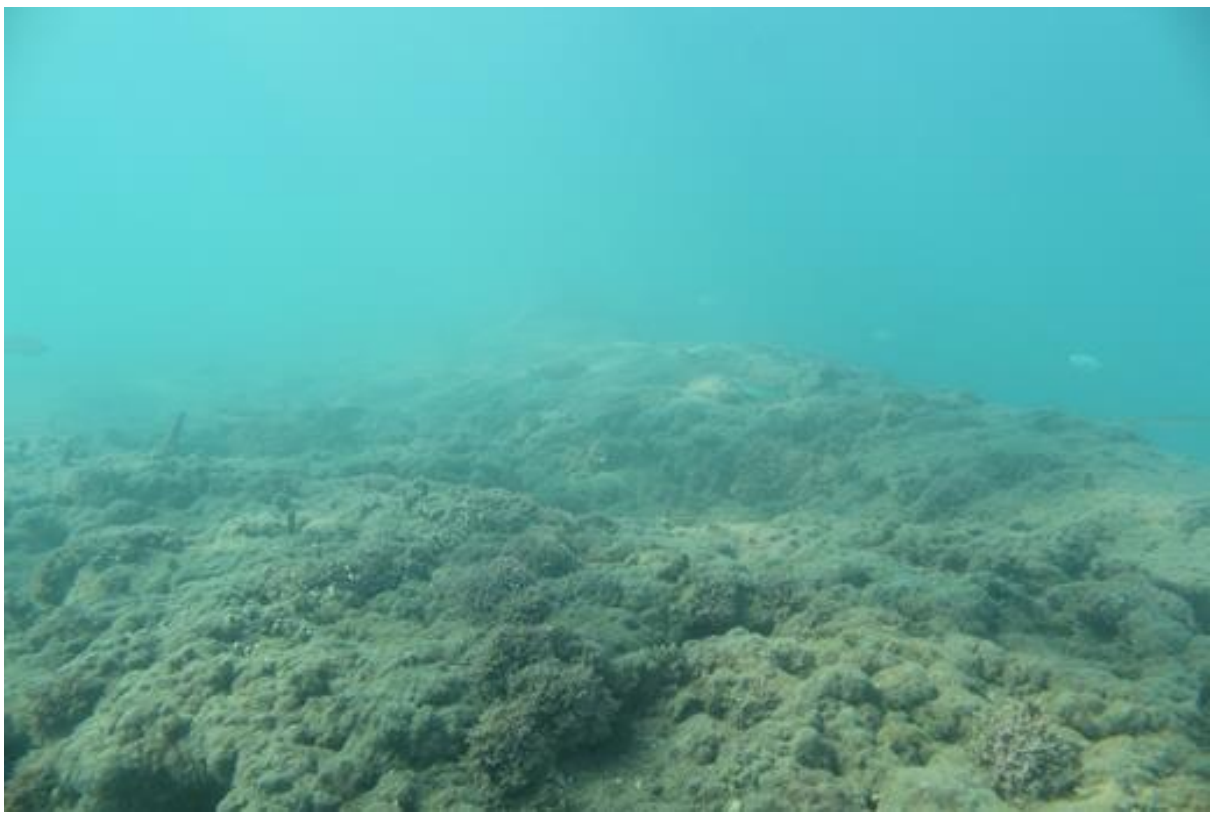
and bivalves predominate in fauna in these areas, depending on the sediment characteristics. Increasing erosion rates of this habitat are a widespread impact throughout the watershed, mainly due to the anthropogenic impact. The increase in marinas and other urban and tourism industry infrastructure, sea level rise as a result of global warming, reduction of river sediment inputs as a result of dams, riverbed quarrying, land use changes, ports and other coastal defense structures are important problems for this habitat. These factors appear at different scales in each coastal region. Rising sea level and increasing stochastic climate-induced events will increase this habitat loss in the future. In some Mediterranean countries, it is restricted to certain distance zones from the coast for dredging sand and gravel. Some beaches are also protected by NATURA 2000 sites and different statuses; because Green Tortoise (*Chelonia mydas*) and Loggerhead Tortoise (*Caretta caretta*) regularly nest on these beaches (Photo II.3.63).

Photograph II.3. 61. Dune areas at the Project site affected by wave movements just above the Water Level

II.3.7.2.5. Algal communities that live attached to rocks in areas from the sea surface to the depth where the light disappears **(Eunis Code: A3.1x)**

This habitat consists of rocky bottoms covered by steep macroalgae that do not form canopy. As a structure; includes shrub-forming algae, grass-forming algae, encompassing fauna, and epiphytes. It is widely distributed in shallow coastal areas in the Mediterranean. Predatory fish

and sea urchins can play an important role in determining the abundance of different algae and drastically changing the ecosystem. Pressures and threats to this habitat are directly related to anthropogenic impacts such as warming, invasive species, pollution, sedimentation and overfishing, and increased coastal development. Although exposed to anthropogenic influences, communities adapt to rapidly changing conditions and can be highly resilient to these influences. However, more studies are needed to know its exact distribution and conservation status in the Mediterranean and its potential recovery capacity. These include improving water quality, Marine Protected Areas (MPAs) and fisheries regulations (Photo II.3.64).



Photograph II.3. 62. Algal communities that live attached to rocks in areas from the sea surface to the depth where the light disappears

II.3.7.2.6. Fine sand dunes in the sea and fauna communities using these areas (Eunis Code: A5.23)

The infralittoral fine sands in the Mediterranean play an important role in maintaining the ecological balance of the beaches. The epifauna and infauna of these environments can be rich and diverse, and this habitat is suitable for the development of some commercial species such as shellfish. Organic accumulation from natural and anthropogenic sources can have adverse effects, which can lead to the change of settled species and the introduction of different species.

Physical disadvantages (sediment removal, siltation), removal of aggregates and spread of exotic species from fishing practices may adversely affect this habitat. There are few studies on the characterization of infralittoral assemblages in these soft-bottomed Mediterranean environments, and little is known about the trends and status of this habitat.

This habitat is on the clean sands of shallow waters (4 to 25 m deep) on open coasts, subject to moderate wave action (the sediment at these bottoms is predominant, but filter-feeding and carnivores are also present: The invertebrate communities found in this habitat are known as 'Littoral Fine Sand Communities', but they are closer to muddy communities. Habitat typically contains no significant seaweed or seagrass component (Photo II.3.65).

Photograph II.3. 63. Fine sand dunes in the sea and fauna communities using these areas

II.3.7.2.7. Muddy areas in the sea and fauna communities using them (Eunis Code: A5.28)

This habitat is typically observed in sheltered bays in closed or semi-enclosed brackish water lagoons, estuaries, and muddy bottoms of the upper sublittoral zone. It is widely distributed in the Mediterranean, although its geographic distribution in the eastern Mediterranean is less known. The habitat is characterized by the predominance of different species of opportunistic fauna and flora, which can withstand moderate to high organic loads from coastal areas. Threats

from various human activities, particularly construction and discharge, as well as changes in local water flow/chemistry and benthic dredging and fishing are directly linked to some of the observed impacts on this habitat. A decrease in habitat quality due to industrial pollution has been reported in different environments in the Mediterranean. However, more studies are needed as little is known about the ecology of this habitat's impact on its communities. There is no specific conservation action currently in place for this habitat. Extensive research is needed to better understand its conservation and management and to evaluate the distribution of this habitat. Identification of reference sites for long-track trends and continuation of existing monitoring programs will assist in examining changes in this habitat (Photo II.3.66).

This habitat is found in sheltered areas with stable sedimentary areas at depths of 1-15 m with a low hydrodynamic regime. The substrate consists of mud-sand sediment, in which there are usually mollusks in the sand. Organic matter and alluvial clay content are the main factors determining the composition of the species. The highly variable environmental conditions of these shallow environments in salinity and water temperature allow these habitats to be colonized by euryhaline and eurytherm organisms. This habitat can be naturally colonized by seagrass or seagrass meadows. In the absence of algae and seagrass, polychaetes from invertebrate communities predominate.

Photograph II.3. 64. Faunaal assemblages of sheltered Mediterranean infralittoral muddy sands in the Project Area

According to the underwater dives and observations carried out within the working license limits, as you go from the shore to the deep; It is understood that it has a marine bottom structure consisting of coastal rocky areas, bare sand areas and mud areas, and the biological diversity is shaped in this context.

II.3.8. CRITICAL HABITAT EVALUATION IN TERMS OF MARINE ORGANISMS

In terms of flora, critical habitats according to IFC standards are areas with high biodiversity value. Accordingly, areas of great importance for Critically Endangered and/or Endangered species are considered within the definition of critical habitat. Seven fish species that can use the marine ecosystem boundaries of the Project have high conservation status (see Table II.3.6).

Anguilla Anguilla, Aetomylaeus bovinus, Gymnura altavela and *Monachus monachus* species are in CR (Critically Endangered) status in terms of these criteria. In addition, *Epinephelus marginatus, Raja radula* and *Rhinobatos rhinobatos* species are in EN (Endangered-Endangered) status. All of these species in question use the marine area of the project for wandering and feeding purposes, so there is no habitat within the project area that could be a suitable spawning area for these species. However, since these species have the potential to use the marine habitat of the project, this region is a critical marine habitat.

The feet of the pier to be built in the marine area will cause some effects on the ground structure, but this effect will not have any negative impact on the population of these critical species that use the area for feeding purposes only. Mitigation measures for the conservation of biodiversity are described in the relevant section of this report. These identified impacts are recommended based on current best practices and information, and the “same or better” principle is followed to achieve net gains.

II.3.9. THE EFFECT OF THE PLANNED PROJECT ON THE MARINE ECOSYSTEM AND PROTECTION MEASURES

Aquatic life and habitat of the project area; Compared to other environments in the immediate environment, there is no distinctive habitat feature in terms of algae and phytoplankton, zooplanktonic organisms, benthic fauna and fish species.

In terms of bound algae and phytoplankton, intense algae blooms are not seen due to the high water quality value in the study areas and its immediate surroundings. In addition, the relatively strong current in this area provides intense water circulation and prevents algae from accumulating and covering the water body. For this reason, the water quality values of the project area are higher than the coastal and bay areas and pollution factors such as algal blooms are not observed.

In the planned activity areas, zooplanktonic organisms in the second step of the aquatic food chain exhibit similar characteristics with other regions in terms of species diversity and densities.

One of the most important factors affecting the presence and distribution of benthic fauna is the dissolved oxygen value. It is possible to see some Mollusca and Annelida species in the planned activity areas and near the coast. The diversity of habitats in the sea bottom structure, especially in the areas close to the coast, causes an increase in benthic species diversity. Considering the distribution of benthic species, Polychaeta class members from Annelida branch are dominant in sandy soils, and Mollusca branch dominance in rocky areas closer to the coast.

The marine habitat structure in the Ceyhan Petrochemical Port area does not differ from the general coastal habitat structure of the Eastern Mediterranean. In other words, although it is important for fisheries, it does not have a distinctive habitat structure separate from other areas in its near and far surroundings. The activity covers a very small surface area considering the entire Mediterranean coast. Due to the filling, dredging and scaffolding works in this area, a habitat loss will occur in terms of macroalgae and microalgae, zooplanktonic organisms, benthic organisms and fish. However, habitat degradation in these areas may regain its former character in a short period of time.

The benthic flora and fauna living on and in the sediment will also be damaged during the fill and bottom scraping in the region. Benthic species will be removed along with the sediment in

the scraped and filled areas. Benthic species in untreated nearby areas may be adversely affected by the sediment cloud (such as mussels fed by filtration). The bottom part in the activity area, the sediment cloud formed during the filling may prevent the species that feed by filtering and breathe with their gills from fulfilling these functions. The benthic species, which are exposed to this effect and can move, will move away from the environment and withdraw to more suitable areas for themselves.

Shortly after the completion of the activities in the project area, the basic elements of the aquatic ecosystem will begin to reappear in these areas. Attached microalgae communities will first be seen on the fill rocks and piled pier legs to be formed in these areas. The microalgae in question will enable many zooplanktonic and benthic invertebrate groups to come to the area for feeding, and then fish species will start using these areas again.

The damage that will occur in the bottom structure of the project area, especially during the excavation, filling and deepening activities, the flora - fauna elements and abiotic factors that will come to the region at least one year after the activity is completed, will begin to regenerate the old habitat structure.

The bottom habitat in the project area is abundant in many places in its immediate surroundings and along the entire Mediterranean coast. The ground habitat structure in the region where the port works will be carried out will be adversely affected. However, there are also large areas with similar ground structure in the immediate vicinity of the area, which will not be adversely affected by the project.

According to the biological findings obtained from the study area, the species diversity of the environment is high. The identified algae, zooplanktonic organisms, benthic organisms and fish all contain cosmopolitan species. However, there are also species that need to be protected, which are not in the study area but can be observed in the immediate vicinity. The commitments in the annexes of the relevant contracts for these species will also be valid for this project.

The planned activity will adversely affect the aquatic system during the construction phase. During the filling and excavation works, especially benthic invertebrates and macro algae attached to the ground will be damaged. However, this effect will be in a small area. When the construction activities come to an end, the damaged system creatures will soon begin to enter the same environment. After construction, the fill and excavation areas will be an important shelter, feeding and nesting area for biological life.

For this reason, the content of the material to be used in the filling is very important. The stones to be used for this must be a hard material resistant to external influences. The material that will consist of large rock blocks should be insoluble in water and analyses should be made to ensure that they do not contain toxic heavy metals and some chemicals. Otherwise, the results of the project will be adversely affected and the marine ecosystem may be polluted.

The clouding of sea water during filling can create undesirable conditions especially for fish and planktonic creatures. For this, for any filling work to be done on land, first the fillings in the sections forming the sea boundaries of the filling area should be completed and a barrier should be drawn and then the section between this barrier and the coastal part should be filled. Thus, the turbidity effect that will occur during the filling will disappear as the connection with the sea will be cut off.

When the bottom structure of the region is examined, it is observed that a dense layer containing sand and silt is present. Increasing turbidity in the water body with filling and scraping works will cause a change in water quality values. In this case, many pollutants accumulated in the sediment can mix with the water body. For this reason, these substances that will be mixed into the environment from the sediment will physically and chemically change the environmental conditions and may cause undesirable conditions for marine life. In addition, the sediment mixed with the water body can adhere to the gill systems of aquatic organisms, especially fish, and adversely affect the respiratory mechanisms.

Since the increased turbidity will prevent the light from reaching the bottom parts, macro and micro algae, a long-term effect can harm these living things. However, these effects that will emerge with the filling and scraping works to be carried out within the scope of the project will not be long-term. Considering the activities that have been carried out especially in places close to the study area and have similar effects, all marine biota, especially macro and micro algae, have been able to maintain their existence. Considering the sediment sizes and duration in this study, the impact will be very limited.

Fish species will move away from the environment where turbidity occurs. For this reason, the fish will also be affected by the sediment cloud at a limited level. When all of these effects are evaluated, it is thought that there will not be a significant impact on the sediment, fish species and fishing activities of the region.

It is recommended to take the following measures in order to minimize the risks created by the mixing of the sediments into the aquatic system.

- Filling should be done in the least limited area possible and unnecessary interventions should not be allowed.
- Spring (March, April, May and early June) is known as the breeding season when marine biological activity is at its highest. During these periods, care should be taken to ensure that the filling works are at minimum levels. Noise, turbidity and mechanical effects may adversely affect the presence and quantity of eggs, young and adult individuals in this period when the densities of marine life begin to increase. Carrying out the marine construction activities in the late autumn and winter months, when the biological activity is at its lowest, will reduce the impact of these activities on the marine ecosystem.
- Filling and scraping works should not be done in unsuitable wind and wave conditions. Otherwise, sediment clouds can spread rapidly to distant places.

During the operation phase of the activity, factors that will adversely affect the dynamics of the marine ecosystem should not be allowed. It is necessary to fully implement the control and regulation of both the wastes in the terrestrial environment and the wastes of the ships in the quay. Due to the minimum flow in the port, it is inevitable to control solid and liquid wastes according to the relevant regulations. The following practices should be considered in order to protect the water quality and biota of the marine ecosystem during the construction and operation phases of the project.

- • A unit with expert personnel should be established to monitor and manage the environmental variables of the port. This unit should establish the environmental management policies of the port and standards prepared in accordance with all relevant regulations should be used. Within the scope of these standards, the following practices should be followed meticulously.
- Hazardous wastes for the marine ecosystem such as paint and solvents should be collected in certain areas and delivered to accredited storage and disposal facilities.
- Solid wastes should never be thrown into the sea and should be collected daily with a regular collection system and disposed of at the places stipulated by the municipality.
- Bilge water should not be allowed to be discharged into and near the quay, and systems should be available to collect these waters.

- The toilet water on the quay should not be allowed to be discharged into the sea, and these wastes should be removed by pumps within the scope of environmental management and disposed of in accordance with the regulations.
- Polluting factors originating from the maintenance and repair facilities to be established within the project area should not be allowed to enter the quay area.

Impact and Precautions to be Occurred in the Areas to be Dredged

Dredging is the process of carrying out works such as the protection of sea routes, the construction / deepening of port basins, the opening / deepening of channels, the arrangement of coasts and the opening of new channels. The purpose of dredging is to increase the depth in the water areas, open new waterways, expand the ports, arrange the coasts and clean the bottom.

Within the scope of the works in the project area, dredging will be carried out in the port entrance corridor, in front of the quays and in the ship maneuvering area in order to ensure the depth of the large tonnage ships that will dock at the port.

Since the main focus of dredging is to remove sediment from the seafloor, the environmental impacts of the process also occur around this focus. Some of the effects of the scanning process can be listed as follows;

- • The sediment at the bottom has a certain physical and chemical composition and this composition is changed by dredging and get mixed with the water body.
- Plants and animals living in the bottom parts and their habitats are damaged by dredging.
- There is an increase in the effect of suspended solids and therefore turbidity (it has a direct effect on flora and fauna).
- Depending on the nature of the material in the dredged area, it is possible to spread pollutants, nutrients and organic substances to the environment.
- Precipitation of suspended solids formed by dredging may cause coverage and deterioration of the bottom fauna and flora in the activity area.

In addition to these negative effects, dredging studies also have positive aspects. Although all the above mentioned issues are the disadvantages that arise with the dredging of clean bottom particles, sometimes dredging is also done to remove the pollutants accumulated in the sediment from the aquatic environments.

A table has been prepared showing the temporal and spatial scales at which various environmental effects can be realized. Accordingly, it is defined as near field effects (less than approximately 1 km) and far field effects occurring greater than approximately 1 km (Bray, 2008).

The effects of the dredging planned to be carried out in the Port area of the Project and the measures are described below.

- Removing material from the seafloor during all dredging operations also removes sediment-dwelling animals (benthic animals). With the exception of some benthic bottom animals or mobile surface animals that may survive dredging, dredging may result in the complete removal of animals from the excavation site. Some marine species are more sensitive to the effects of dredging than others. For example, dredging in the area of species such as seagrass can cause irreversible damage to these slow-growing species. However, there are no seagrass meadows in the project area.

  The recovery of habitats in the post-dredging period depends on the nature of the new sedimentation in the dredging area and the characteristics of the recolonized animals. In soft sediments, recovery of animal communities usually occurs relatively quickly, and more rapid recovery has been observed (ICES 1992).

  Many studies have been conducted on when benthic organisms started to use the area in the period after the dredging works carried out in coastal areas around the world (Table II.3.10). It has shown that the recovery rates of benthic assemblages after dredging in various habitats vary greatly (Nedwell and Elliot 1998; Nedwell, Seiderer and Hitchcock 1998).

Table II.3. 10. The time it takes for benthic organisms to come back to the area depending on the Soil Structure.

Location	Habitat Type	Recovery Time
Coos Bay, Oregon	Estuary Muds	4 weeks
Gulf of Cagaliari, Sardinia	Channel Muds	6 months
Mobile Bay, Alabama	Channel Muds	6 months
Goose Creek, Long Island	Lagoon Muds	>11 months
Klaver Bank, North Sea	Sand-Pebbles	1-2 years
Chesapeake Bay	Mud-Sand	18 months
Lowestoft, Norfolk	Pebbles	>2 years
Dutch coastal waters	Sand	3 years
Boca Ciega Bay, Florida	Crustaceans and Sand	10 years

The rates of re-settlement of benthic organisms in the environments after scanning occur most rapidly in sediments in estuary muds dominated by opportunistic species. In general, the recovery times of benthic species after dredging take quite a long time in gravel and sand habitats dominated by long-lived components with complex biological interactions that control community structure.

These findings are supported by studies suggesting that silt and clay sediments have only a short-term effect on animal populations. Although almost complete removal of organisms occurs during dredging, recovery begins within 1 month and within 2 months benthic assemblages are reported to be similar to pre-scan conditions (Stickney and Perlmutter 1975).

Considering that the bottom structure of the area to be dredged in the project is sand and mud, it is understood that the benthic creatures in the area where the impact will occur will begin to use the area again and intensively within 1 year. As a matter of fact, in the dredging and subsequent monitoring studies in the regions given in Table II.3.10, it is understood that benthic organisms have started to be seen intensively in

the environments within 4 weeks and 11 months in the areas with mud bottom structure.

- The increase in suspended solids and turbidity is high during dredging and disposal of uncontaminated material. All dredging methods disperse sediment into the water column during excavation. This increase in turbidity in the water column can have adverse physical effects on marine animals and plants. The extent of these environmental impacts is effective within the treated area and is usually only temporary as long as the dredging operation continues.

  Suspended solids destroy the feeding and respiratory organs by blocking and damaging the food intake ways of living things that feed with filter system, such as shellfish mollusks (Brehmer 1965). Similarly, suspended matter that causes turbidity can build up in the gills and cause the death of young fish. More adult fish, on the other hand, can avoid these effects by moving away from these turbid environments. Increases in turbidity also temporarily reduce the productivity and growth rates of marine organisms, preventing light from reaching seagrass meadows and other plants.

  The residence time of the sediment mixed with the sea column in that environment depends on the size of the dredged sediment, the dredging method, hydrodynamic regime in the area and the existing water quality. However, dredging activities do not generally cause any more turbidity than the suspended solids produced during severe storms. Also, natural events such as storms, floods, and great tides can increase suspended sediments in larger areas for longer periods of time than dredging operations (Environment Canada 1994). Therefore, it is often very difficult to separate the environmental impacts of dredging from activities of natural processes.

  Sea dredging carried out in closed areas where there is no current effect, such as a port, is very unlikely to carry the material to a wider environment and to affect the biological, physical and chemical structure of the sea in that region.

  The effects of suspended sediments and turbidity are usually short-term (<1 week after activity) and in the near field (<1km from activity). In general, if there is a sensitive species in the immediate area that needs protection, there will be situations for concern and countermeasures may needed to be taken.

  It is necessary to take precautions against this sediment and turbidity that is expected to occur in the marine area of the project. Silt curtains should be used to prevent or reduce the effects of sand cloud during dredging. For this, the circumference of the

ship where the activity will be carried out during excavation should be circularly closed with these silt curtains. The curtains that will be from the sea floor to the surface and the turbidity formed during scraping will only be effective in this area and will not spread to the environment (Photo II.3.67).

Photograph II.3. 65. Silt curtains that prevent turbidity

- During the bottom dredging, organic materials in the sediment can come into the water body. As a result, the consumption of oxygen used in the decomposition process of organic materials can increase rapidly, causing the marine animals and plants in the affected area to become anaerobic or blocking the passage of migrating fish or mammals. However, it is important to emphasize that the removal of oxygen from the water is only temporary, as the need for oxygen from the immediate surroundings will quickly replenish.

  Therefore, oxygen depletion from dredging in open coastal waters where the project area is located has little impact on marine life.

- • In general, the material accumulated in the sediment in the dredged areas is subject to some contamination. Various harmful substances including heavy metals, oil, TBT, PCBs and pesticides can effectively lock the seabed sediments in ports and harbors. Dredging operations has the potential to cause contamination and/or poisoning by releasing these pollutants into the water column which can be taken up by animals and plants. During dredging, when low-level contaminants are introduced into the water column, they can accumulate in marine animals and plants and be transferred down the food chain to fish and marine mammals via bioaccumulation.

- ***However, according to the results of the analysis carried out in the area to be dredged within the scope of the Ceyhan Energy Specialized Industrial Zone Raw Material Supply, Storage and Port Facility Project, the pollutants in question are at a level that will not have a negative impact on sea creatures. For this reason, it is expected that sediment pollutants originating from dredging studies in the region will not have a negative impact on the marine ecosystem.***

- Sediments emitted during dredging may be deposited on the animals and plants living on and in the seafloor by re-settlement. This can cover benthic animals and plants with sediment, causing them to suffocate, reducing growth or reproductive rates (Bray, Bates & Land 1997).

  Marine animals and plants immediately move away from areas with high naturally suspended sediment clouds. Relatively small increases in siltation are generally thought to have adverse effects on benthic populations. Animals with sensitive feeding or respiratory structures, such as shellfish, may be intolerant to increased siltation. Dredging in key spawning or breeding areas for fish and other marine animals can result in suffocation of eggs and larvae.

  When evaluated in terms of the Raw Material Supply, Storage and Port Facility Project of the Ceyhan Energy Specialized Industrial Zone, a negative situation is not expected due to siltation, since the bottom structure in the areas to be scanned is completely covered with sand and mud habitats, causing low species diversity in these areas.

Definitions of the effects described above before and after taking precautions are given in Table II.3.11 and Table II.1.12.

Table II.3. 11. Impacts Before the Precautions During the Construction Period

Sub-Components	Modified and Natural Habitats			
Impact	**Organism Sensitivity**	**Impact Size**	**Convertibility**	**Overall Impact**
Marine habitat loss	Low	Low	Low	Low, direct, short term
Water quality change	Low	Low	Low	Low, direct, short term
Noise	Low	Low	Low	Low, direct, short term

Tablo II.3. 12. Effects After the Precautions During the Construction Period

Sub-Components	Modified and Natural Habitats			
Impact	**Organism Sensitivity**	**Impact Size**	**Convertibility**	**Overall Impact**
Marine habitat loss	Low	Low	Low	Low, direct, short term
Water quality change	Low	Low	Low	Low, direct, short term
Noise	Low	Low	Low	Low, direct, short term

In the project area, apart from the filling sections, piers where ships and boats will dock will be constructed. It is expected that there will be damages on the ground during this process. Although these works will have an impact during the construction phase, the creatures in the environment that are affected in these parts of the marine ecosystem during the operation phase will be able to come back to the environment after a short while and create suitable habitats for themselves.

Benthic invertebrates and ground-bound macroalgae will be affected during marine construction works. It has been observed that the sand habitat is dominant, especially in the areas where filling and excavation work will be carried out. Macroalgae clusters, albeit very few, were observed on this sand. Filling works will have an impact on the ecosystem in this section. The diversity of benthic species in the sand habitat in the area where the filling works will be carried out is not high. Particularly, the members of the Annelida branch and the Bivalvia and Gastropoda species belonging to the Mollusca group are abundant and widespread. No endangered or rare species was found among these creatures. Although the entire ecosystem in the filling area to be made in the sea will be impacted, the consequences of this effect will be in a small area when the whole Mediterranean is considered.

When the construction activities come to an end, the damaged system creatures will be able to continue their lives in other suitable areas for them. After the construction, the fill and excavation areas will be an important shelter, feeding and nesting area for biological life. After the large filling blocks are placed, care should be taken to fill the material to be thrown on them with the material previously taken from the same place and should not have an easily soluble content.

A short time after the filling works, algae will first settle on and between the piles to be formed for the rock blocks and the pier, and many invertebrates will find shelter and nutrition among the algae. Especially Polychaeta and Mollusca members will use these as a place to hide and hold on to. Fish will come to the area where these creatures live to find food and the aquatic system will regain a dynamic. This process may take place in less than a year depending on biotic and abiotic factors.

There is no suitable shelter, nesting and breeding area for the Mediterranean Monk Seal in the area where the port will be built, and they can only use the area for navigation and feeding purposes. Therefore, the project will not have a negative impact on this species.

As a result; Although the project will have impacts on the marine ecosystem, if the above-mentioned measures are taken, the project will have a sustainable and minimal impact on the natural ecosystem. The presence of similar quality sites in a very large area, including the immediate surroundings of the project site, shows that there are sufficient marine habitats to meet the ecological demands of all aquatic creatures, especially fish species.

Evaluation in Terms of Sea Grasses

In the project area, it is expected that there will be damages done on the ground during the scaffolding, dredging and filling to be built. Although these works will have an impact during the construction phase, the creatures in the environment that are damaged in these parts of the marine ecosystem during the operation phase will be able to come back to the environment after a short while and create suitable habitats for themselves.

Seagrasses, locally called "noodles", are aquatic angiosperms adapted to the marine environment and have roots, stems, leaves, flowers and seeds like terrestrial plants. There are 50 species of marine angiosperms worldwide. 7 angiosperm species belonging to the genera Cymodocea, Halophila, Posidonia, Ruppia, Zostera are distributed in coastal and transitional waters throughout Turkey and the Mediterranean. These species are *Cymodocea nodosa*,

Halophila stipulacea, Posidonia oceanica, Ruppia cirrhosa, Ruppia maritima, Zostera marina and *Zostera noltii* (Taşkın and Yıldız, 2017). They belong to the group of flowering plants with flower-like organs.

Posidonia oceanica, which is the most important seagrass species for our country's waters and also known as a Mediterranean endemic, is found throughout the Mediterranean. It is found in Turkey's Mediterranean and Aegean Sea coasts until a depth of 35-40 m, and in the Sea of Marmara where it spreads in a small area around the Dardanelles Strait, Kapidag Peninsula and Marmara Island. *P. oceanica* has a creeping or erect stem called rhizome, which is usually covered with sediment (Thelin and Boudouresque 1983).

P. oceanica has an ecologically important role in the sea as it prevents erosion in the sea with its roots, produces oxygen through photosynthesis at the bottom, and creates an environment for fish and other sea creatures to live in (Boudouresque, Meinesz 1982, Cirik Ş., Cirik S., 1999). 50 species of fish were identified in the meadows of P. oceanica. Of these, 56% are permanent, 22% are temporary, and 22% are sporadic species. The most important families of these species are Labridae, Scorpenidae, Serranidae and Centracanthidae (Harmelin-Vivien 1982,1989).

However, P. oceanica facies has been destroyed, especially in France and Spain, due to the effects that damage the seabed and the environment where the plant community lives, such as sea pollution due to industrialization and dense population, hunting with drag gear such as trawling illegally on the coasts, and artificial beaches. For this reason, the species was included in the "species group that should be protected" (Jeudy De Grissac-1989, Meinesz et al. 1991, Boudouresque et al. 1994). For this reason, countries with a coast on the Mediterranean create monitoring stations by mapping P. oceanica meadows. In addition, P. oceanica meadows are classified as priority habitats according to the European Union Species and Habitats Directive (H&SD,92/43/EEC).

However, since seagrasses develop very slowly, they are very sensitive to coastal structures, mechanical damage, bottom trawling, boat anchors and pollution and suffers irreversible losses. The Action Plan, adopted by the contracting parties at the Barcelona Congress in 1999, aims to take measures for the protection and management of seagrass meadows, to combat the decline of seagrass meadows, which are key components of littoral ecosystems, and to ensure the protection of seagrass meadows in characteristic regions. The implementation of this action

plan is provided by UNEP/MAP-RAC/SPA. Therefore, it is also protected by the current Action Plan by the Turkish Maritime Law.

When the bottom structure of the marine area where Ceyhan Petrokimya port facilities will be established, *P. oceanica* and other marine meadow species were not observed. It has been observed that rocky and sandy biotopes are dominant especially in coastal areas. In its slightly deeper parts, muddy habitats were observed..

As a result, no seagrass areas were observed during the dives made in the project sea areas and there will be no negative situation regarding the seagrass meadows.

II.3.10. CONCLUSION

Within the Adana Ceyhan Energy Specialization Industrial Zone Raw Material Supply, Storage and Port Facility Project marine ecosystem studies, examinations were made on the presence of macro and micro algae, zooplanktonic organisms, benthic organisms and fish species in the area, their densities and the general condition of the ecosystem. The results of these examinations are given below.

- According to the physical measurement values and general observations, it is seen that the environment is consisting of clean water. All of the identified algae, zooplanktonic organisms, benthic organisms and fish contain the common and abundant species of the Mediterranean.
- It has been observed that the mechanical impact of the project on the marine ecosystem is not very intense. It is thought that there will not be an activity that may adversely affect the aquatic ecosystem in the bottom structure of the marine ecosystem and in the port part of the facility.
- Within the project area, benthic invertebrates, ground-bound macro algae, zooplankton and fish will continue to live in a healthy way on the sea floor.
- In the sampling studies conducted in the project area, it has been observed that the densities of aquatic system organisms are high and they are taxa that are widely distributed in the Turkish seas.
- It is recommended that the monitoring studies of the effects that may occur in the Adana Ceyhan Energy Specialized Industrial Zone Raw Material Supply, Storage and Port Facility Project be carried out twice a year, in the spring and autumn months. Thus, an impact that may occur in the ecosystem will be detected in a short time and it will be possible to make necessary and rapid interventions.

As a result, during the construction and operation activities to be carried out within the scope of the Ceyhan Energy Specialized Industrial Zone Raw Material Supply, Storage and Port Facility Project, there will be impacts to an extent in terms of biological life in a certain area, but this will not affect the entire marine ecosystem. When this activity is completed, a highly diversified ecological habitat will be able to regenerate spontaneously in the affected area in a short time.

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II.4. SEA TURTLE EVALUATION REPORT

II.4.1. INTRODUCTION

All technical and non-technical information about the related project is stated in the EIA application file presented on 13.05.2020..

The project area is located in Yumurtalık Free Zone-Adana. There are piers belonging to BOTAŞ Adana Regional Directorate and BIL (BOTAŞ International Limited) company towards the west of the project area. Towards the east of the project area, there are many facilities actively operating in the free zone. The piers and facilities on both sides of the project area are in active working condition. The location of the said project area on Turkey is given in Figure II.4.1.

Figure II.4. 1. Location of the project area in Iskenderun Bay and beaches with sea turtle nesting (Blue: Holland and Botaş beaches, Red: İncirli Beach, Yellow: Burnaz Beach).

There is no beach area within the project area. In addition, İncirli Beach is on the western border of the project area, Holland Beach is located 1.8 km west, Burnaz Beach is approximately 4 km east of the project area. Sea turtle nesting activities take place on all of these beaches (Candan and Kolankaya, 2016; Candan, 2018).

According to the Circular No. 2009/10 on the Protection of Sea Turtles, prepared by the General Directorate of Nature Conservation and National Parks and published in the Official Gazette, the closest official nesting beach to the project area is Sugözü Beaches, which starts with Holland Beach, 1.8 km west of the project area. Consisting of four beaches from west to east, namely Akkum, Sugözü, Botaş and Holland Beach, Sugözü Beaches are some of the important nesting areas for green sea turtle (Chelonia mydas) in our country (Canbolat et al., 2005). Incirli Beach which is located towards the west of the project area and Burnaz Beach which is located towards the east are not sea turtle nesting beaches determined by the Circular No. 2009/10 on the Protection of Sea Turtles in our country.

The location of the project area relative to the mentioned beaches is given in Figure II.4.1. As can be seen from the figure, the Project area is located 1.8 km (both terrestrial and marine) from the end point of the Sugözü Beaches towards the west of it. Incirli Beach begins at the western border of the project area. It is located approximately 4 km from the terrestrial point of Burnaz Beach, which is located towards the east of the project area. The possible impacts of the Project on sea turtles were evaluated in the report within the scope of the results obtained from the field study carried out on the beaches close to the Project area.

II.4.2. AIM

The Sea Turtles Evaluation report has been written for the Ministry of Industry and Technology Ceyhan Energy Specialization Industrial Zone Raw Material Supply, Storage and Port Facility Project. The purpose of this Sea Turtles Assessment Report is to determine the presence of two sea turtle species and one brackish turtle species (*Caretta caretta, Chelonia mydas and Trionyx triunguis*) in and around the project area in the coastal areas that are likely to be affected by the project activities.

For this purpose, the general situation of sea turtles in the project area and its surroundings and the precautions to be taken were tried to be determined according to the results of the field study. Within the scope of sea turtle monitoring studies, information showing whether the project area and its surroundings are used for shelter and/or breeding purposes has been compiled.

The main objective of these studies, which were carried out before the project construction activities started, is to take the necessary precautions regarding the sea turtle species and to minimize the possible effects of the project activities (both during the construction and operation phases) on these species.

II.4.3. PROJECT AREA AND TIMING

The closest beaches to the sub-region of Sugözü Beaches, are the Hollanda (1.8 km away) and the Botaş beaches right next to it which are located towards the west of the planned project,. The closest nesting beach towards the east of the project is Samandağ Beach, located in Hatay province, approximately 85 km away.

The two closest sub-regions to the west of the project area are within the BOTAŞ Adana Regional Directorate campus. While BOTAŞ Beach is used for recreational purposes, recreational use is very limited in Hollanda Beach.

The beach adjacent to the western border of the project area is İncirli Beach. The first beach to the east of the project area is Burnaz Beach. Although Burnaz Beach is not officially a nesting beach, it is a nesting area for sea turtles and soft-shelled nile turtles (Candan, 2018).

The mating period of sea turtles lasts from the beginning of April to mid-May and the nesting season generally covers the period from mid-May to the end of July. The hatching of the young from the nests on the beaches ends towards the end of September.

Therefore, the breeding period of sea turtles lasts from the beginning of April to the end of September. In the soft-shelled Nile Tortoise, the nesting period lasts from early May to mid-June. Nesting in mid-June is extremely rare.

II.4.4. RESULTS OF THE MONITORING STUDIES

Two sea turtles and one brackish water turtle known to breed on the Turkish coasts within the scope of the evaluation of the possible impact of the Ceyhan Energy Specialized Industrial Zone Raw Material Supply, Storage and Port Facility Project on sea turtles; *Caretta caretta* (Loggerhead turtle) and *Chelonia mydas* (Green turtle) and *Trionyx triunguis* (Soft Shelled Nile Tortoise) have been detected in and around the project area. There are data obtained from scientific literature and personal researches on this subject.

During the field studies, two nests of *Chelonia mydas* (Green turtle) were identified on İncirli Beach, two nests on Holland Beach and three nests on Burnaz Beach. In addition, many nestless leave activities belonging to the Loggerhead turtles and the Soft Shell Nile Tortoise have been identified on Burnaz Beach. The date of the fieldwork was a period when nesting activities were high for all three species.

The data show that the project area and its immediate surroundings are heavily used by two sea turtles (*Chelonia mydas* and *Caretta caretta*) and one brackish water turtle (*Trionyx triunguis*).

The results of the fieldwork carried out with a team of 5 people on 26-27 June 2020 are given below. The locations of the detected nested leave activities are presented in Table II.4.1 and the map showing the distance between the activities in İncirli Beach and the project area is presented in Figure II.4.2. The visuals of the field studies are given in Photographs II.4.1-II.4.18.

Table II.4. 1. Field Study Results (26-27 June 2020)

BEACH NAME	NEST CODE	SOECIES	UTM	X	Y
İNCİRLİ	İY-1	*Chelonia mydas*	36 S	762857	4086812
İNCİRLİ	İY-2	*Chelonia mydas*	36 S	762722	4086793
ERZİN	EY-1	*Chelonia mydas*	37 S	234937	4090929
ERZİN	EY-2	*Chelonia mydas*	37 S	234785	4091004
ERZİN	EY-3	*Chelonia mydas*	37 S	234721	4091026
HOLLANDA	HY-1	*Chelonia mydas*	36 S	761227	4085524
HOLLANDA	HY-2	*Chelonia mydas*	36 S	761252	4085530

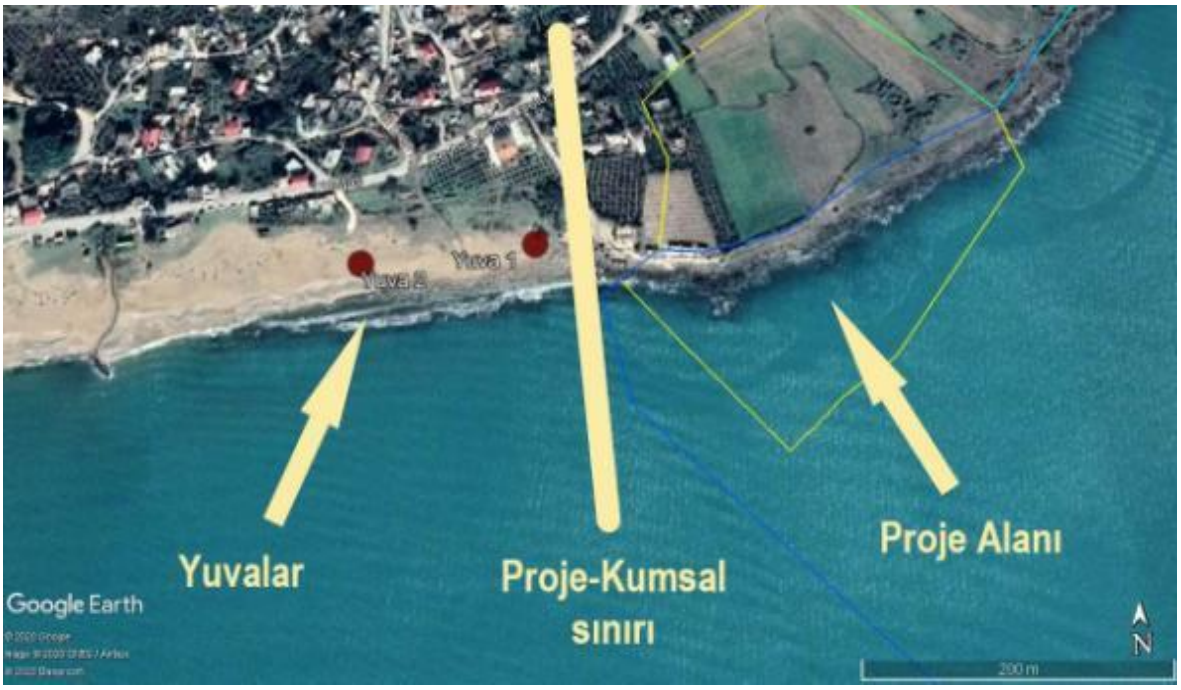

Figure II.4. 2. The distance between the project area and the nests on İncirli Beach (Nests shown with the arrow on the left side, Project-Beach border shown with the arrow in the middle and Project area shown with the arrow on the right handside).

Photograph II.4. 1. Incirli Beach (June 2020)

Photograph II.4. 2. İncirli Beach rocky part (June 2020)

Photograph II.4. 3. Starting point of the project area (June 2020)

Photograph II.4. 4. Incirli beach nest location (June 2020)

Photograph II.4. 5. Incirli beach nest location_2 (Haziran 2020)

Photograph II.4. 6. Finding the nest (June 2020)

Photograph II.4. 7. Green turtle egg (Incirli Beach) (June 2020)

Photograph II.4. 8. Eggs in the nest (İncirli Beach) (June 2020)

Photograph II.4. 9. Green turtle leave activity without nest (İncirli Beach) (June 2020)

Photograph II.4. 10. Burnaz Beach (June 2020)

Photograph II.4. 11. Green Turtle (*Chelonia mydas*) leave and return trail at Burnaz Beach (June 2020)

Photograph II.4. 12. Green turtle (*Chelonia mydas*) nest and dune structure suitable for nesting on Burnaz Beach (June 2020)

Photograph II.4. 13. Nest Locating (Burnaz Beach) (June 2020)

Photograph II.4. 14. Green turtle (*Chelonia mydas*) eggs (June 2020)

Photograph II.4. 15. Burnaz Beach Soft Shell Nile Tortoise (*Trionyx triunguis*) leave trail (June 2020)

Photograph II.4. 16. Burnaz Beach suitable habitat for Soft Shell Nile Tortoise (*Trionyx triunguis*) (June 2020)

Photograph II.4. 17. Rocky coastal structure within the project area (June 2020)

Photograph II.4. 18. Typical rocky shore within the project area (June 2020)

December is not a time to watch for Sea turtles and Soft Shell Nile Tortoises. Due to their biology, these species are active in the hottest months of their region. The breeding period of sea turtles lasts from the beginning of April to the end of September, while the nesting period of the Soft-shelled Nile Tortoise lasts from the beginning of May to mid-June.

In addition, the monitoring of these species is different from the monitoring of other fauna elements. Since these species use both terrestrial and aquatic habitats, monitoring studies are basically possible by determining the number of nests and natality (offspring participating in the population). Counting in the marine area requires a much higher budget effort.

In order to determine the extent to which these species are affected by the project activities, the number of nests, the number of hatching without a nest, the success of nest-egg-hatchling should be regularly monitored during the consecutive seasons from May to October. Especially in sea turtles, since an adult female nests every three years on average, it is recommended that this monitoring should be continued for at least 5 years, although it varies according to the area.

During the field observation carried out in December, no findings related to these species were found. In addition to this expected result, no sandy beach suitable for nesting has been identified in the coastal zone of the project area. In the examinations made around the project, it was

presented in the previous evaluation that Burnaz, İncirli and Sugözü Beaches are areas used by Sea Turtles and Soft Shell Nile Turtles.

The numerical values of the species that should be monitored within the project site impact area are presented in Table II.4.2. The values in the table are given depending on the literature and personal research results of the last five years (2017-2021).

Table II.4. 2. Numerical values of the species that needs to be monitored within the project site impact area (2017-2021)

Species	IUCN	BERN	CITES	Literature	Season	Beach	Nest number
Trionyx triunguis	CR	Annex II	Appendices II	Personal observation	2020	Burnaz	1
				Candan, 2018a	2017	Burnaz	2
Caretta caretta	VU	Annx II	Appendices II	Personal observation	2020	Burnaz	2
				Candan, 2020	2020	Sugözü	1
Chelonia mydas	EN	Annex II	Appendices II	Personal observation	2020	Burnaz	47
				Turan et al., 2021	2019	Yeniyurt	85
				Candan, 2017	2017	Sugözü	48
				Candan, 2018b	2018	Sugözü	92
				Candan, 2019	2019	Sugözü	66
				Candan, 2020	2020	Sugözü	99
				Candan, 2021	2021	Sugözü	141
				Personal observation	2020	İncirli	2

Personal observation: Onur Candan

As expected, there were no findings in the study carried out in the winter season. However, from the spring period, the activities of the mentioned species will begin in the marine area. Nesting will occur following these activities. Soft-shelled nile turtle nesting starts earlier than sea turtles. Therefore, considering the legal permit processes, the planning for sea turtle and soft-shelled nile turtle monitoring should be completed in April.

Images of winter biodiversity and monitoring studies are given in Photographs II.4.19-II.4.27.

Photograph II.4. 19. Suitable habitat for *Trionyx triunguis* (November 2021)

Photograph II.4. 20. Suitable habitat for *Trionyx triunguis* nesting (November 2021)

Photograph II.4. 21. Suitable nesting habitat for *Caretta caretta (Burnaz Beach) (*November 2021*)*

Photograph II.4. 22. Burnaz Beach (November 2021)

Photograph II.4. 23. Suitable nesting habitat for *Chelonia mydas* (November 2021)

Photograph II.4. 24. Vegetation and sand dunes behind the beach (November 2021)

Photograph II.4. 25. İncirli Beach (November 2021)

Photograph II.4. 26. Rocky area not suitable for nesting (Project site) (November 2021)

Photograph II.4. 27. Project site (November 2021)

The threats that the sea and brackish turtles, whose existence is detected in field studies, are faced with or may encounter, have been evaluated on a global scale, with their status in the Red List published by IUCN and their status listed in the annexes of the BERN convention. In addition, the national-scale protection status of these identified species has been evaluated in accordance with the Ministry of Forestry and Water Affairs Protected Species List.

The categories and abbreviations used in the red list published by IUCN are as follows;

- EX: (EXTINCT): Species that have been proven extinct by undoubted evidence.
- EW: (Extinct in its natural environment): Species that are extinct in the wild but exist in other areas (for breeding or display).
- CR: (Critically Endangered): Species that are in critical danger of extinction in the wild.
- EN: (Endangered): Species in great danger of extinction in the wild.
- VU: (Vulnerable): Species in danger of extinction in the wild.
- NT: (Nearly Threatened) Species that are not currently endangered but are candidates for VU, EN or CR category in the near future.
- LC: (Least Concern): Commonly found species.

- DD: (Data Deficient): Species for which there is not enough information.
- NE: (Not Evaluated): Species not yet evaluated for compliance with the above criteria.

BERN Convention annexes and their categories are as follows;

Annex-I: Strictly Protected Flora Species

Annex -II: Strictly Protected Fauna Species

Annex -III: Protected Fauna Species

The annexes and categories of the Mulga Ministry of Forestry and Water Affairs are as follows:;

Annex -I: Wild animals determined by the Ministry of Forestry and Water Affairs

Annex -II: Game animals determined by the Ministry of Forestry and Water Affairs

Annex -III: Wild animals taken under protection by the Ministry of Forestry and Water Affairs

In İncirli Beach, which is the closest beach to the project, a total of 5 activities have been identified, including 2 green turtle nests and 3 green turtle nestless exits. However, no leave activity with or without a nest was determined for the loggerhead turtle.

Hollanda Beach, the second closest beach to the project area, is also an official nesting site for the green turtle. During the field studies, a total of 6 activities were identified, including 2 green turtle nests and 4 green turtle nestless leave activities.

At Burnaz Beach, which is approximately 4 km from the project area, a total of 11 activities have been identified, including 3 green turtle nests and 2 green turtle nestless leave activities, 4 Soft Shell Nile Tortoises nestless leave activities and 2 loggerhead turtle nestless leave activity. As previous studies have revealed, there is also the presence of both Loggerhead and Green Turtles in the Iskenderun Bay.

Loggerhead turtle (Caretta caretta) is listed;

- In the IUCN Red List as “VU” on a global scale, Mediterranean Subpopulation as “LC”
- In “Annex II” of the BERN Convention Annexes

  In "Annex I and Annex III" in the protected species list of the Mulga Ministry of Forestry and Water Affairs

Green turtle (Chelonia mydas) is listed;

- In the IUCN Red List, both the global and Mediterranean Subpopulations as "EN"
- In “Annex II” of the BERN Convention Annexes
- In "Annex I and Annex III" in the protected species list of the Mulga Ministry of Forestry and Water Affairs.

Soft Shell Nile Tortoise (Trionyx triunguis) Mediterranean subpopulation is listed;

- As “CR” in the IUCN Red List
- In “Annex II” of the BERN Convention Annexes
- In "Annex I and Annex III" in the protected species list of the Mulga Ministry of Forestry and Water Affairs

Considering the IUCN, BERN and OSB Lists, all of the species found in the field studies are both nationally and internationally protected species that are seriously endangered and at risk.

II.4.5. GENERAL EVALUATION AND RECOMMENDATIONS

There are seven species of sea turtles in the world. These species are D*ermochelys coriacea, Eretmochelys imbricata, Lepidochelys kempii, Lepidochelys olivacea, Chelonia mydas, Natator depressus* and *Caretta caretta*. In the "red list" published by IUCN, *Chelonia mydas*, which also uses the Turkish beaches of the Mediterranean, is stated as endangered (EN) (Seminoff, 2004) and *Caretta caretta* as vulnerable (VU) (Casale and Tucker, 2017) species. Both of these categories on the red list reveal that the species is endangered. These species are also protected by the Bern Convention and CITES.

Five of the seven sea turtle species *(Dermochelys coriacea, Eretmochelys imbricata, Lepidochelys kempii, Chelonia mydas, Caretta caretta*) are found in the Mediterranean. Among these species, those that regularly use Mediterranean beaches for nesting are *Chelonia mydas* and *Caretta caretta* (Groombridge, 1990). The nesting areas of *Chelonia mydas* consist of Turkey (Baran and Kasparek, 1989) and Cyprus (Broderick and Godley, 1996). *Caretta caretta* nesting areas are consisting of Greece (Margaritouilis, 1998), Turkey (Geldiay et al., 1982), Libya (Laurent et al., 1999) and Cyprus (Demetropoulos and Hadjichristophorou, 1989).

Mating of sea turtles occurs a few weeks before the start of nesting near the nesting beach or in special gathering areas. In addition, tightly packed pairs often appear on the surface, although underwater matings has also been reported (Limpus and Reed, 1985; Dodd, 1988).

The reproduction period of sea turtles covers various stages, including mating, spawning and hatching. The female chooses night hours for nesting and after determining the appropriate time, she goes up the beach. The female that comes to the beach does not always nest and lays eggs approximately 3 times during the nesting season (Groombridge, 1990; Broderick and Godley, 1996). This number may vary between regions and seasons (Richardson and Richardson, 1982; Frazer and Richardson, 1985; Addison, 1996; Canbolat, 1997).

The incubation period of the eggs is affected by factors such as temperature, humidity, sand grain structure, view of the beach, shading, vegetation and latitude-longitude. Therefore, the incubation period may vary between regions and seasons. For Sugözü Beaches, this value was determined to be around 53 days (Candan and Kolankaya, 2016). The eggs of *C. mydas* and *C. caretta* are generally round, white, soft, covered with mucus, about 45 mm in diameter and 45 g in the size of a ping-pong ball. Small, oval-shaped or adjacent eggs may also be found among the eggs. The number of eggs laid in the nests is about 100 and the incubation period is 6-13 weeks (Miller, 1997).

Egg predation can be done by foxes, dogs, pigs, badgers, jackals and sand crabs. Wind erosion, wave erosion, sand uptake and vehicle traffic are other factors that can cause death during embryonal development.

After breaking the egg shells, the hatchlings remain motionless in the nest for up to 26 hours in order for their carapes to recover, and leaving the nest occurs 1-7 days (average 2.5 days) after hatching, when the hatchlings help each other to climb towards the surface (Demmer, 1981; Miller, 1982; Dodd, 1988). The hatching of the young usually occurs at night when the sand surface temperature drops.

Juvenile mortality is considered high after hatching and in the first few days of swimming. Crabs, foxes, dogs, shorebirds, nearshore fish and sharks are the most important juvenile predators. Besides their natural predators, deaths have also been reported as a result of misdirection with beach lighting (Dodd, 1988).

Sea turtles are species that are widely distributed in tropical and subtropical areas around the world. According to the climatic conditions of the region in which this wide geographical distribution area is located, the breeding season of sea turtles varies. However, in accordance with the Circular on the Protection of Sea Turtles of our Ministry (2009/10), the breeding period is handled between April 1 and September 30, taking into account the mating period on official

nesting beaches. However, construction works in the terrestrial area are limited between 1 May and 30 September.

Sea turtles are beach dependent creatures due to their biology. They lay their eggs at suitable points on the nesting beaches at regular intervals. It is an undisputed fact that sea turtles need nesting beaches in order to sustain their generations on earth.

However, areas that were determined by the "Nesting Areas Protection-Use Provisions" within the scope of the General Directorate of Nature Conservation and National Parks' Circular No. 2009/10 on the Protection of Sea Turtles as First Protection Area (vertically from the sea to the land), Second Protection Area, the Buffer Zone and Area of Influence do not overlap with the project area. Therefore, the project area is exempt from the provisions of this circular.

Sugözü Beaches, which are the closest nesting beaches to the project area, are close to the Hollanda Beaches subregion area. In addition, nesting was detected on the beach adjacent to the project area. It has been determined that Burnaz Beach, which is within the project impact area, is used by both sea turtles and soft-shelled nile turtles (Candan, 2018). For this reason, it is considered necessary to implement the precautions to be taken at sea turtle nesting beaches. Its proximity to the Hollanda Beach and the nesting sites found on İncirli Beach are within the distance to be affected by the planned facility (Figure II.4.3).

Figure II.4. 3. Beaches around the project area

Although it is not an official obligation, it is important to protect biological diversity, which is an important heritage not only for our country but also for the world. In this context, the importance of each species is high. The absence of an impact on these species is a sign of our respect for the environment.

A negative effect may be seen for *Chelonia mydas* (Green turtle) in the terrestrial zone. However, there is a possibility of encountering *Caretta caretta* (Loggerhead turtle) and Chelonia mydas (Green turtle) that use the marine zone permanently.

Construction works to be carried out between April and September should be carried out under the supervision of a doctoral level expert consultant who has worked in the area or in its immediate vicinity. During these dates and within 1 mile from land to sea, sea vehicles should not be used at high speeds. If these conditions are complied with, it is considered that an undesirable encounter will not occur. In case of propeller impact, which may occur despite all precautions, interventions should be made in line with the opinion of the expert regarding the supervision of the works.

It is recommended to carry out field and monitoring studies at İncirli Beach every nesting season (during May-October months) and at regular intervals (for example 3 times a month) under the supervision of a doctoral level expert sea turtle consultant who has carried out studies in the area or in its immediate vicinity during all construction and operation phases.

Apart from these suggestions and practices, it is recommended that necessary studies be carried out and measures be taken in line with the opinion of a doctoral level expert in sea turtles in order to solve the problems that may arise regarding the subject. If the suggestions presented under this title are implemented, the negative effects of the facility to be established on sea and brackish water turtles will be minimized.

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II.5. MEDITERRANEAN MONK SEAL (*Monachus monachus*) REPORT

II.5.1. INTRODUCTION

Within the scope of the Raw Material Supply, Storage and Port Facility (will be referred to as "Port" from this point onwards) project planned to be realized by Ceyhan Petrokimya Industry Zone Management Inc., studies were carried out to clarify whether the area is used by the Mediterranean Monk Seal (*Monachus monachus*) for reproduction, shelter, feeding etc. In this context, in the pre-construction period in June 2020 and November 2021, a 2-day field study for the autumn-winter period was carried out. Field studies were carried out through observations from land and sea. In this study, SCUBA and snorkeling methods were applied to monitor the current situation, since the habitats in and around the region were previously evaluated in terms of seal and seal habitats.

Mediterranean monk seals are distributed in a wide geographical area. Although its main distribution area is the Mediterranean, it can be seen in the Marmara and Black Seas. This species has also been found on the Atlantic coasts of South Africa such as Mauritania, Senegal and Gambia, and on the Atlantic islands of Cape Verde, the Canary Islands, Madeira and the Azores. More recently, however, it has disappeared from most of its former ranges, with the most severe contraction and fragmentation during the 20th century. The Mediterranean monk seal has never been observed in the last century on the coasts of France and Corsica, Spain and the Balearic Islands, Italy and Sicily, Egypt, Israel and Lebanon (Figure II.5.1).

Figure II.5. 1. Distribution of *Monachus monachus*

The Mediterranean monk seal (Monachus monachus) is one of the critically endangered marine mammals with a shrinking population of less than 600 individuals. It is also described as "critically endangered" by the World Conservation Union (IUCN). It is also on the Annex I list of the Convention on International Trade on Endangered Species (CITES). The endangered status of the Mediterranean monk seal has also been dentified by the Bonn Convention (Convention on the Conservation of Migratory Wildlife Species), Bern Convention (Convention on the Conservation of European Wildlife and Natural Habitats), Convention on Biological Diversity and the EU Habitats Directive.

Mediterranean monk seals take refuge in caves that are hard to reach by humans, mostly along deep rocky shores. Such caves may have underwater entrances that are not visible from the shoreline. It is known that it extends its feeding and circulation areas by emerging from these rocky shores. It is known that they can rarely be observed on sandy or pebble beaches or in estuaries.

The main habitat of the Mediterranean monk seal is the remote and untouched shores. As they are large cetaceans, they cannot survive in narrowly confined habitats. The species can breed safely only in the presence of a coastal area of optimum size and suitable breeding cave.

Although scattered, the world's largest population is in the Aegean Sea. Therefore, Greece and Turkey have great importance and responsibilities for the protection of the undisturbed habitats of this species in the Mediterranean. In the field studies carried out to date, it has been determined that there are approximately 100 individuals on the Turkish coasts.

Mediterranean monk seal is observed in the following coastal areas in Turkey; In the Sea of Marmara, the Armutlu Peninsula, the Marmara Islands, the Mola Islands and the Kapidag Peninsula and the northern coasts of the Karabiga coasts, the Gallipoli Peninsula (on the Aegean side) and the Behramkale coasts, and the New Foça coasts up to Datça, the Datça and Kemer coasts, Gazipaşa-Taşucu (Kilikya coasts) and between the coast between Samandag and the Syrian border.

For the Raw Material Supply, Storage and Port Facility (hereinafter “Port” will be used) project planned to be realized by Ceyhan Petrokimya Industry Zone Yönetim AŞ; One of the issues stated in the letter of Republic of Turkey Ministry of Agriculture and Forestry, General Directorate of Nature Conservation and National Parks, numbered 62865314-611.02-E.1499574, "The region's Mediterranean monk seal (Monachus monachus) provides breeding-sheltering-feeding, etc. This report is presented in order to clarify whether it is used for other

purposes. For this purpose, habitats in and around the region were evaluated with SCUBA and snorkeling methods on 29 June 2020.

II.5.2. GENERAL INFORMATION

Conservation

Mediterranean monk seal (*Monachus monachus*) is one of the most endangered creatures in the world. It is listed by the IUCN as the highest level of critically endangered species (CR). These creatures are under protection under the BERN, CITES, BARCELONA and Biological Diversity conventions approved by our country (Kıraç, et al., 2013).

In our country, the first scientific studies on these creatures started in the 1960s. Following these pioneering studies, which can be considered as individual studies, comprehensive studies including conservation studies have been continued effectively by institutions such as SAD-AFAG, IU-SUF and ODTU-DBE. Experts working on this subject have come together to prepare regional and national ACTION PLANS and NATIONAL STRATEGIC PLANS, as well as making individual publications on their field and subject. In addition, the NATIONAL MEDITERRANEAN SEAL COMMITTEE was formed by the experts mentioned (Kıraç, et al., 2013; Kıraç, Savaş, & Güçlüsoy, 1998; Güçlüsoy et al., 2004).

Population

The Mediterranean monk seal, which was common in the Mediterranean and the Atlantic until the last century, today, is living only on the coasts of Greece, Morocco, Mauritania and Madeira (Portugal) and our country around the world. In recent studies, in addition to these countries, small populations have been found in countries such as Cyprus, Libya and Morocco (Kıraç, et al., 2013). It is estimated that the world population is around 600 (Kıraç, et al., 2013) and 700 (Kıraç, Savaş, & Güçlüsoy, 1998), and it is known that approximately 60 – 100 (Güçlüsoy et al., 2004) of them live on the coasts of our country. Although they tend to form colonies due to their normal behavior, they are often forced to choose the way of wandering and living individually instead of being together due to human pressure (Kıraç, Savaş, & Güçlüsoy, 1998).

Distribution in Turkey

In Turkey, although seals can be observed in all our seas, they are especially found in Aegean and Mediterranean coasts where there are islands, islets, reefs and steep rocky coastlines. In our country, it has been reported that there are 17 important coastal regions containing

Mediterranean monk seal habitat. Some of these are under protection and some do not have any protection status (Kıraç, et al., 2013).

Habitat

Mediterranean seals prefer caves, cavities, cracks and deserted coasts suitable for sleeping (Kıraç, et al., 2013). Mediterranean monk seals choose "quiet and secluded rocky beaches with coastal caves and cavities that are uninhabited, inaccessible to humans or away from human activities, preferably having reproductive and/or sheltering functions" as their habitat, and are directly affected by the deterioration of these areas (Kıraç , Savaş and Güçlüsoy, 1998).

On the other hand, based on this definition, it cannot be concluded that Mediterranean monk seals do not use different types of beaches (for example, sandy shores and coastal settlements). It is known that the Mediterranean monk seal expands its circulation area by going out of the deserted rocky beaches especially to feed, and also visits sandy, pebbly shores and river mouths (Kıraç, Savaş and Güçlüsoy, 1998).

However, the primary habitat of the Mediterranean monk seal is deserted and unstructured rocky shores. Since it is a large marine mammal, it cannot live in narrow living spaces. The species can survive and breed safely only if there are reasonable sized and suitable coastal areas (Kıraç, Savaş, & Güçlüsoy, 1998).

Behaviour

The Mediterranean monk seal is timid and less social than other pinniped species. Eastern Mediterranean individuals living on the coasts of our country generally travel alone and are rarely seen together. It is also known that researchers occasionally observe between 2 to 4 seals together in Turkey, and even though very rarely, this number has went up to 7 to 8 during past observations. Like many of its features, complete information about its behavior is not available. There are assumptions that Mediterranean monk seals came together in certain periods and then dispersed again. Adult male individuals generally determine a region and live there (Kıraç, Savaş, & Güçlüsoy, 1998).

Although females are more wandering than males, they do not leave the breeding cave and its surroundings during the breeding period. Young seal individuals, on the other hand, may go to distant areas during their breeding season. It is estimated that female Mediterranean seals travel long distances to mate and come near the male seals and then leave the male's territory. Mating takes place at sea. It is estimated that the female seal reaches sexual maturity at the age of 3

years. After a 10-11 month pregnancy period, the female Mediterranean monk seal gives birth to a calf every year or 2 years. For this reason, the Mediterranean monk seal is a creature with a low reproduction rate and a low number of offspring. Birth takes place on a pebble beach or rocky platform where the waves can't reach easily, at the far end of an air-filled coastal cavern that humans can't visit (or reach). The mother nurses the young with her own milk for about 4 months on land inside the cave. Mediterranean monk seals absolutely need land (and especially coastal caves) to give birth and raise their young (Kıraç, Savaş and Güçlüsoy, 1998).

Feeding

Mediterranean monk seal is a carnivorous creature which is a common feature of pinnipeds. The majority of its food consists of fish, octopus and lobster, which it catches underwater by diving. When it catches its prey, it sometimes brings it to the surface. It shakes its head rapidly from side to side in order to kill its prey and eat it by shredding it. Meanwhile, it eats the piece left in his mouth and catches it by swimming after the big piece that has been thrown. It repeats the same movement until it finishes its prey. Since Mediterranean seals are mammals, they have lungs like humans and they breathe with air. They dive to the bottom by using the oxygen in the air they take into their lungs on the water and they do not breathe underwater. Mediterranean monk seals usually dive for 5-10 minutes and come back to the surface to breathe (Kıraç, Savaş, & Güçlüsoy, 1998).

Threats and causes of dissapearance

There are different factors that threaten the seal population. These can be listed as follows:

1. Habitat destruction
2. Mediterranean monk seal mortalities
3. Disturbances in caves
4. Reduction in fish stocks
5. Sea pollution
6. Sea traffic

The most obvious among these reasons is the destruction of habitats. Mediterranean monk seals live in areas far from human activity. The absence of people in these desolate places is due to the absence of private property. Such areas exhibit a rocky and rugged morphology. Touristic

facilities, second homes and infrastructure investments such as roads leading to these settlements and lighting lead to habitat destructions.

II.5.3. MATERIALS AND METHODS

In this study, observation-based monitoring study was carried out in terms of the existence of seals in the region where the said port will be built and in the surrounding region. For this purpose, by exceeding the seaside boundaries of the facility, the coastline in the region where the planned port will be located has been scanned to cover the area between the Ceyhan Toros Pier in the Northeast and the Botaş Ceyhan Pier in the Southwest. This area, where the total length was recorded as 5.3 km (the line marked with yellow in Figure II.5.2), was examined in terms of possible individual presence in accordance with the life cycle and behavior of the seal. Within the area itself and its impact area, there were no observed caves, cracks and cavities, however, there is a possibility of migration, daily migration and feeding behavior. In field studies, observation techniques from boat and land were applied in order to observe the possible individuals in the region (Figure II.5.2).

In the observation study made from the boat, it was taken into account that the seals watch the fishing boats (Sergeant et al., 1978) in order to benefit from the fish caught by watching the fishing boats, which is a common behavior (during the placement and collection of fishing nets in the sea).

For observations made from land, the researchers made it to the region in the early morning hours (5:00), as was practiced in previous studies. Observation studies with binoculars and cameras were continued until 08:00, until the sky got bright (Güçlüsoy and Savaş, 2003).

One method used to understand the availability of seals in the study areas and to get comprehensive information on which region they use at which stage of their life cycle is to scan social media with Citizen Science methods and to conduct interviews/surveys with fishermen, divers and sailors who use the region effectively. (Bundone et al., 2019; Mo et al., 2007; Mo, 2011; Sullivan et al., 2019). With this method, data collection studies were carried out on fishermen, and 8 fishermen of the region were interviewed. These interviews will be continued extensively in the second follow-up study.

Figure II.5. 2. Study area (scanned coastline marked with the yellow line).

In this study, biotope (habitat) structure and status information and macro biological diversity were evaluated by applying the Underwater Visual Counting (SGS) technique in order to support the observations made from boat and land and to determine the current status of the habitats of the region. During these studies, imaging techniques (photo - camera) were also applied.

Among the different sampling techniques used to assess the diversity of macro fauna and flora in the marine ecosystem, SGS has been adopted to study shallow and near-shore habitats (which may have heterogeneous substrates such as artificial reefs, rocks or corals) (De Girolamo, Mazzoldi, 2000).

The regions visited during SCUBA and snorkeling dives were also evaluated in terms of the general condition of the marine environment and biodiversity. Underwater Visual Counting (SGS) technique was used in biodiversity assessment studies.

II.5.4. RESULTS

II.5.4.1. Evaluation of Habitats in Terms of Seals

No seal individuals were found in the observation study made from the boat. In these studies, interviews were held with 3 fishermen who were on their boats in terms of the availability of seals. As a result of the interviews, the fishermen, that were determined to have been hunting in the region for more than 10 years, that are professional, and go out hunting every day when the weather is suitable (at least 180 days/year) did not observe any seals in the project area (between Botaş Ceyhan Pier and Toros Ceyhan Pier) in the last 5 years.

For land-based observations, we were in the area in the early morning (5:00) for three days in June 2020 and November 2021. Observation studies with binoculars and cameras were continued until 08:00, when the weather was clear, but no seal observations could be made.

Interviews and surveys have been started with people who use the region such as fishermen, divers and sailors and who work at the facilities in the region. Although 8 additional regional fishermen were also interviewed, including the fishermen who go out to sea for fishing studies, it has been reported that no seal observations have been made in the study area in the last 5 years.

Terrestrial Region

In the field studies carried out in the area where the port will be built, it was determined that the coastal part of the coastal area generally has the "low coast" feature, while the low coastal beach structure has a rocky and occasionally sandy habitat structure (Photo II.5.1- II.5.3).

In some point-specific regions of the study area, although there is no high coast, it has been determined that there are cliffs higher than the rocky formation in the general area; In the SGS studies intensified in this region, it was determined that there are very small cavities, but the cavities in this region are not suitable for breeding, sheltering or hiding for seals (Figure II.5.3: Indicated by the red circle).

Figure II.5. 3. Regions with high rocky formations in the coastal area

Photograph II.5. 1. Beach and rocky formations in the coastal area

Photograph II.5. 2. Rocky formations in the coastal area

Photograph II.5. 3. High rocky formations in the coastal area

Marine Region

Considering the habitat structure of the marine region, different soil structures and the existence of biological life models associated with them were observed. There are more and more different habitat types from coastal to open areas. The dominant habitat in coastal areas is sandy ground structure. As you move away from the shore, the mud ground structure becomes dominant (Photo II.5.4- II.5.5).

In the area where the project activity area is located and in its immediate surroundings, the first 400 - 600 meters (depth: 5 - 6 meters) of the marine environment from the shore, together with the rear coast and the inner coast (tidal zone), is determined to be a "sand bottom" habitat type.

It was determined that the "rocky bottom covered with pebbles" habitat type was found in the parts of the sandy floor corresponding to the rocks in the terrestrial region.

Photograph II.5. 4. View from sand habitat

Photograph II.5. 5. View from the rocky base habitat

In the field studies, after the sand bottom habitat, the field studies were terminated, and the area was determined to have a mud bottom habitat type at a distance of 3 km from the shore and up to a depth of approximately 14 meters.

II.5.5. EVALUATION OF BIOLOGICAL (FOOD) DIVERSITY IN THE HABITATS IN TERMS OF SEALS

Benthic Macro Invertebrates Identified in Field Study

Studies of the complex relationships among benthic animals have focused on their definition and distribution in relation to environmental variables. Although such studies are essential for initial assessments of populations, experimental studies of regulatory environmental variables of physiological origin have not been used among benthic communities as much as they are used in studies between planktonic communities. In the seas, the population, productivity and feeding relationships of benthic fauna are poorly understood; slightly better known in streams.

However, the distribution of benthic fauna in the seas is extremely important as seals have different requirements for feeding, development and reproduction. A nurturing environment can allow seals to be evaluated within the scope of their habitat, as it can at least respond to feeding-housing behavior.

Marine benthic macroinvertebrates are greatly affected by changes in their habitat and seasonal variations, such as changes in oxygen content and the input of living or dead organic matter required for food. Benthic organisms either have adaptive mechanisms to cope with these changes and enter the stationary phase to await favorable conditions, or die. The distribution, development, productivity and reproductive potential of benthic organisms depend on their ability to adapt to environmental parameter changes.

Benthic animals are extremely diverse and are represented by almost all branches, from protozoa to large macroinvertebrates and vertebrates. This fact, combined with the heterogeneous habitat, feeding, development, reproduction, mortality and behavioral characteristics, makes it extremely difficult to handle these animals with a holistic and functional approach. The benthic organisms of the study area are given in the relevant sections of this report (see Table II.3.4).

Fish Identified in Field Studies

Fish are important biological components in the upper ring of aquatic systems as well as the fact that they are among the main food sources of seals. In the SGS studies carried out in the region, it has been determined that especially natural rocky habitats increase biological richness and create suitable hunting grounds for seals. The fish species identified in the region are given in the relevant parts of this report (see Table II.3.5).

The general habitat structure and biological diversity of the study area were evaluated; Although it is not suitable for shelter and/or hiding for seals, it has been determined that they can show wandering - hunting behavior and the area has sufficient biodiversity in terms of nutrition.

II.5.6. CONCLUSIONS

In this study, the structural and current usage characteristics of the region were evaluated. In addition, the habitats in the region were examined in detail in order to determine the possible effects of the planned port during the construction and usage phases. In summary:

- During the studies carried out in the region, no seal observations were made. Also no habitat that they can use or nest was observed. In addition, based on the citizen science study, it was determined that no seal observations were made in the region (study area) in the last 5 years.

- It has been determined that the coastal area that will be affected by the planned port is currently used intensively in terms of similar activities. However, when the usage principles are taken into consideration, it has been determined that, albeit very slightly, the area meet the "desolation" condition, which is the most important phenomenon required for their reproduction, shelter and feeding behavior. It is estimated that these conditions will disappear completely after the construction activities and the commissioning of the port.
- Field studies were carried out in the planned port area and its vicinity (5.3 km in total), but the habitats (used for breeding, sheltering and protection) which are of primary importance for the seals (cave, small cave, hollow) were not observed.
- It has been estimated that the area where the planned port is located can only be used by the seals in terms of feeding behavior..

II.5.7. SUGGESTIONS

The vicinity of the Iskenderun Bay (Kilikya basin), where the planned port is located, has been extensively studied by different researchers (Gücü et al., 2004; Güçlü et al., 2015; Gökoğlu et al., 2012). In these studies, the existence of seals and the breeding and protection caves of primary importance in the region in the Eastern Mediterranean; It is emphasized that especially the west of the Iskenderun Bay, (the regions within the borders of Mersin province) and the borders of Samandag and Syria are important for these habitats. During the field studies, no caves suitable for breeding, sheltering and/or hiding were found in the region.

Although no caves, caverns and hollow structures that may be important for seals were encountered in the field studies, it ensures that the biodiversity in the region can be used as a hunting ground.

Attention should be paid to the effects that will be created during the planned port construction. Screening during construction to prevent turbidity caused by ground movement will minimize the effects that may occur outside the activity area, and prevent pollution that may occur from possible accidents.

In addition, even if they hunt in the region, seals can perceive changing environmental conditions very well due to the fact that they are mammals with high mobility. It is estimated that they will not use the construction area as a hunting ground during the works to be carried

out in the region and they will be able to protect themselves from the newly developing situation.

As a result, it is estimated that the planned activity will not adversely affect the seal existence in the region. However, a summer monitoring study should be carried out before September (July – August), which is the breeding month of the seals. In the follow-up study to be held in the summer term, studies can be carried out by expanding the scope of Citizen Science studies.

II.5.8. REFERENCES

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III. EVALUATION IN TERMS OF CRITICAL HABITAT

III.1. SPECIES EVALUATED AS CRITICAL

Marine and terrestrial biodiversity studies were carried out within the scope of Ceyhan Petrochemical Industry Zone Management (Managing Company) of the "Raw Material Supply, Storage and Port Facility Project" in order to meet the infrastructure and raw material needs of petrochemical facilities within the Ceyhan Energy Specialized Industrial Zone. Accordingly, as a result of sampling and identification studies regarding the habitats and species in both ecosystems, a total of 451 taxa were identified in the marine ecosystem, 188 in terms of terrestrial plants and 73 taxa in terms of terrestrial fauna. In addition, the national and international protection status of these species has been given and the effects of the activity and the precautions to be taken have been defined.

According to IFC Guide 6, Critical habitats are (i) habitats of great importance to Critically Endangered and/or Endangered species; (ii) habitat of significant importance to endemic and/or limited range species; (iii) habitat supporting global concentrations of migratory and/or important community species; (iv) highly threatened and/or unique ecosystems and/or (v) areas associated with key evolutionary processes. Accordingly, in terms of the first two headings for the critical habitat assessment of the stations examined, the Critically Endangered and/or Endangered species and the endemic and/or limited distribution species are given in the relevant tables.

Based on the CR (critically endangered) and EN (endangered) species at the project site, critical habitat assessment can be made for terrestrial and marine habitats of the project area. Accordingly, 1 species of CR (Trionyx triunguis) from reptiles evaluated in the terrestrial ecosystem and 1 species of terrestrial flora fall into the category of EN (*Pancratium maritimum*). While *Trionyx triunguis* is not found in the project area, it is listed because it is located in its immediate vicinity. However, *Pancratium maritimum*, a terrestrial flora species, was detected in the coastal dune area outside the project license area.

Of the fish species in the marine habitat, 4 species are recorded as CR (*Isurus oxyrinchus, Aetomylaeus bovinus, Gymnura altavela, Anguilla anguilla*), while 3 species are critical species with EN (*Raja radula, Rhinobatos rhinobatos, Epinephelus marginatus*). Five of these seven critical species identified from fish are found in cartilaginous fish. Again, two

of these critical species, *Isurus oxyrinchus* and *Rhinobatos rhinobatos*, were caught as a result of our sampling, while other critical species were given according to the literature studies conducted in the region in previous years.

Monachus monachus, one of the critical taxa identified from marine mammals, is classified as CR. With that being said, *Chelonia mydas*, one of the two sea turtles in the region, is the critical species in EN category. As a result of the studies, no individuals or a habitat where *Monachus monachus* could nest were found in the region. However, it has been determined in the field studies that *Chelonia mydas* nests in the beach area right next to the project site and other beach areas in the close vicinity.

The second parameter used in the definition of critical habitat is the assessment of whether the species is of significant importance for endemic and/or limited range species. Accordingly, none of the species distributed in marine and terrestrial habitats within the study area were recorded as endemic. There is also no record that the distribution areas and population densities of these identified species indicating a decrease in the Mediterranean basin

III.2. LEGALLY PROTECTED AREAS

There is no protected area within the terrestrial and marine environment boundaries of the project site. However, the closest protected area of the license area is known as Yumartalık Lagoon National Park. Project activities during construction and operation of the Project do not have the potential to adversely affect the natural characteristics of these protected areas.

III.2.1. YUMURTALIK LAGOON NATIONAL PARK

The total area of the National Park is 16,430 hectares (ha). The total of the Yumurtalık Lagoons Ramsar Area is 19,853 ha. The area is 30 km from Yumurtalık town center and 35 km from Karataş town centre.

Yumurtalık Lagoons is a wetland system with a very complex structure. It is consisting of lagoons located between where Ceyhan River empties into the sea and Yumurtalık Bay, fresh and salt water marshes, wide barren plains, mud flats, reed beds, wet meadows, dunes and Aleppo pine forest. Unlike other lagoons in the region, it has an irregular shoreline and

merges with the sea at many points. The old bed of the Ceyhan River divides the area into two. In the north of the old river bed, there are Çamlık lagoon and Ömer, Yapı and Darboğaz lakes surrounded by wide barren plains, marshes and salty meadows. The depths of the lakes vary between 20 and 60 cm.

Yumurtalık Lagoon is considered as one of the important wetlands of Turkey. The region has beaches for nesting sea turtles and habitats for native and migratory birds that provide suitable habitats for their nesting, feeding and breeding.

The distance of the project area to the wetlands in this region is 27 km and these areas are not expected to be adversely affected by the project activity (Figure III.1).

Figure III. 1. Distance between Renaissance project site and Yumurtalık Lagoon

III.3. IMPORTANT HABITATS FOR CRITICALLY ENDANGERED SPECIES

Incirli Beach which is adjacent to the terrestrial region of the project site is one of the nesting areas of the sea turtle *Chelonia mydas* species. Due to the impact of endangered species on critical habitat, sea turtles are considered to be included under this title. Sea turtles nesting in the project area form a part of the Mediterranean subpopulation defined by the IUCN. This population is classified as Endangered (EN) by the IUCN Red List. Within the scope

of this study, according to the field studies carried out in June 2020 and the literature information known before, İncirli beach is a habitat where *Chelonia mydas* species nest (Figure III.2).

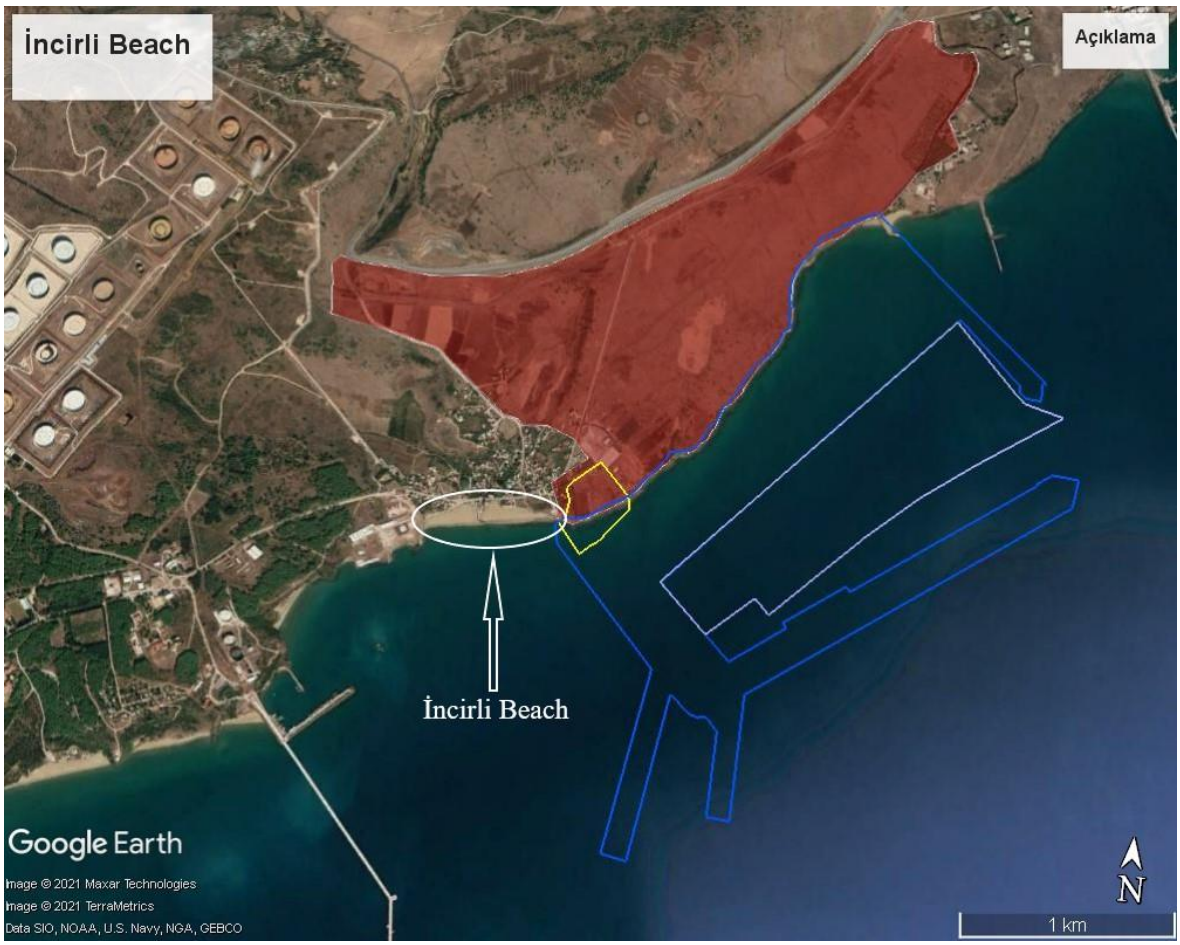

Figure III. 2. Chelonia mydas nesting habitat-İncirli Beach

In addition to nesting on beaches, sea turtles are also found in the open sea during the mating and internest period. In addition, the *Caretta caretta* sea turtle has been observed in the area and Mediterranean subpopulations of this species has been classified as low risk (LC) by the IUCN Red List.

There are also critical species for some marine fish using the Project's marine area. According to the field and literature studies, 5 fish species are evaluated in the CR category and two fish species are evaluated in the EN category.

III.3.1. HABITATS IMPORTANT TO ENDEMIC AND/OR RESTRICTED SPECIES AND SUB-SPECIES

An endemic species is defined as a species that has more than 95 percent of its global distribution within the country or region of analysis (IFC, 2012). A species with a range of less than 50,000 km^2 for a terrestrial vertebrate and a species living in an area of less than 100,000 km^2 for a marine species are defined as species with limited distribution.

No endemic species records have been reported in the terrestrial and marine ecosystems of the project area. However, there are two plant species *Pancratium maritimum* and *Cyclamen persicum*, which are found in limited populations both in our country and in other geographical areas. Of these, *Pancratium maritimum* was observed in the beach areas within the borders of the project site. The other species, *Cyclamen persicum*, was reported together with its coordinates from the project site in the literature and field studies carried out during the previous EIA process. Due to the limited distribution areas of both species, they were evaluated in the definition of the critical habitat class of the region.

One of the species with limited distribution is the marine mammal *Monachus monachus* (Mediterranean Seal). Although this species is widespread in the Mediterranean basin, it tries to survive in small populations in a few localities. It also spreads as a small population in the Eastern Mediterranean coasts that make up the project area. However, there are no suitable habitats for the Mediterranean Monk Seal in the sea parts of the license area, as defined in the relevant sections of this report. However, since the license area is located within the range of the species, it is defined as a critical species with limited distribution within the scope of this report.

III.3.2. REGIONALLY SIGNIFICANT AND/OR HIGHLY THREATENED OR UNIQUE ECOSYSTEMS

When the habitat structure of the marine region of the project area is evaluated, it is seen that it has six different habitat types. The dominant habitat in coastal areas is sandy ground structure. As you move away from the shore, the mud soil structure becomes dominant. While a significant part of these habitat structures are classified in the DD category, A2.25 coded "dune areas affected by wave movements just above the water level" are classified in

the VU category. This habitat has been placed in the "vulnerable" category due to a general decline due to different impacts in many Mediterranean countries.

III.4. PRIORITY ELEMENTS OF BIODIVERSITY

In a significant part of the project area, a modified habitat structure consisting of degraded maquis and agricultural areas formed by the degradation of natural maquis areas is dominant. Although not within the boundaries of the project site, the sandy areas at its border have the potential to be roaming, feeding and nesting areas for sea turtles nesting and some terrestrial plant, reptile, bird and mammal species. Although the project site is not a national or international protected area, it has terrestrial and marine habitats with high biodiversity values. In addition, it has been determined that these habitats contain priority biological elements.

There are some critical species with high conservation status that come to the fore within the scope of terrestrial and marine baseline studies of the Renaissance Project area. The main priority species identified through the assessment of baseline conditions are presented in Table III.1. A significant portion of the species given here are high conservation status species within the definition of Critical Habitat. *Pancratium maritimum* (EN) and *Monachus monachus* (CR) have both been listed as species with high conservation status and limited distribution. In addition, *Cyclamen persicum*, which is on the CITES Convention Appendix II list because its natural populations are under collection pressure, has also been defined as a critical species, although its conservation status is low. This last species is tuberous and leaf and flowering periods appear in the 2nd and 4th months. Except for these months, its tuber is under the ground and it is not possible to observe it. *Cyclamen persicum* species could not be observed by us in the project area, as one of the two separate field studies carried out in the region within the scope of the project was in June 2020 and the other in November 2021. However, it has been defined as a critical species since its presence in the project area is reported in the literature and the EIA report

Chelonia mydas nests on İncirli beach, right next to the project site. This species has been given as critical as it is in the Endangered category and is in the range of eastern Mediterranean populations.

Among the marine mammals, *Monachus monachus* is represented with a very small population in the Mediterranean and is in the CR category. This species also satisfies the second criterion of critical habitat classification due to its low population density.

According to field and literature studies on cartilaginous and bony fish, 5 fish species are in the CR category and two fish species are in the EN category. All of these fish are distributed in many countries in the Mediterranean basin. Therefore, there is no specific restriction as to the distribution area. However, their high conservation status causes them to be considered as critical species in terms of criterion 1. In the sampling studies, *Isurus oxyrinchus* (CR) and *Rhinobatos rhinobatos* (EN) species were caught and identified in situ, and the other five species are known to be distributed in the project sea area according to the literature.

As a result, a total of 12 taxa with limited distribution, falling into high conservation categories (CR and EN) in terms of critical species of the project area were determined. While 12 of these taxa have high conservation status, one species (*Cyclamen persicum*) has been added to the list because it has a regional and limited distribution, although it is in the LC category. In addition, *Pancratium maritimum* and *Monachus monachus* are listed as both high conservation category and limited distribution species (Table III.1). In addition, the numbers and coordinate information of the species observed in the field are given in Table III.2 and Figure III.3.

Table III. 1. Critical Species Table According to the Stations (according to IFC PS6)

Ecosytems	Taxonomic Groups	Determined Taxa	Critically Endangered and/or Endangered species	Endemic and/or restricted-range species
Terrestrial Ecosystem	Amphibia	2	--	--
	Reptiles	12	*Trionyx triunguis* (CR)	--
	Birds	51	--	--
	Mammals	12	--	--
	Terrestrial flora	189	*Pancratium maritimum* (EN)	*Pancratium maritimum* (RRS)
			--	*Cyclamen persicum* (RRS)*
Marine Ecosystem	Algae	120	--	--
	Zooplanctonic Organisms	49	--	--
	Benthic Organisms	200	--	--
	Fish	82	*Isurus oxyrinchus* (CR)	--
			Aetomylaeus bovinus (CR)*	--
			Gymnura altavela (CR)*	--
			Raja radula (EN)*	--
			Rhinobatos rhinobatos (EN)	--
			Anguilla anguilla (CR)*	--
			Epinephelus marginatus (EN)*	--
	Marine Mammals	3	*Monachus monachus* (CR)*	*Monachus monachus* (RRS)*
	Marine Turtles	2	*Chelonia mydas* (EN)	--

*Literature

Table III. 2. Areas where critical species were observed

	Endemic and/or restricted-range species	E	N	Number	Observed Location
Reptiles	*Chelonia mydas*	762854.77 D	4086811.10 K	2 yuva	İncirli Beach, Out of License Area
		762713.31 D	4086782.35 K		
	Trionyx triunguis	237653.00 D	4089683.00 K	3	Burgaz Beach, Out of License Area
Terrestrial Flora	*Pancratium maritimum*	764294.52 d D	4088501.94 K	1	İncirli Beach, Out of License Area
		762800.89 D	4086797.50 K	1	Small beach close to Toros Port, Out of License Area
	**Cyclamen persicum*	It is very likely to be found in maquis vegetation within the project area. It could not be determined because the field studies were outside the leaf and flowering period.		--	Literature
Fish	*Isurus oxyrinchus*	766909.25 E	4087769.92 N	1	Small beach close to Toros Port, Out of License Area
	**Aetomylaeus bovinus*	Uses the marine area of the project as a feeding and roaming area.			Literature
	**Gymnura altavela*	Uses the marine area of the project as a feeding and roaming area.			Literature
	**Raja radula*	Uses the marine area of the project as a feeding and roaming area.			Literature
	Rhinobatos rhinobatos	765693.00 E	4087513.96 N	1	
	**Anguilla anguilla*	They live in the river systems and areas where they open to the sea in the project area.			Literature
	**Epinephelus marginatus*	Uses the marine area of the project as a feeding and roaming area.			Literature
Marine Mammal	**Monachus monachus*	Uses the marine area of the project as a feeding and roaming area.			Literature

* Literature

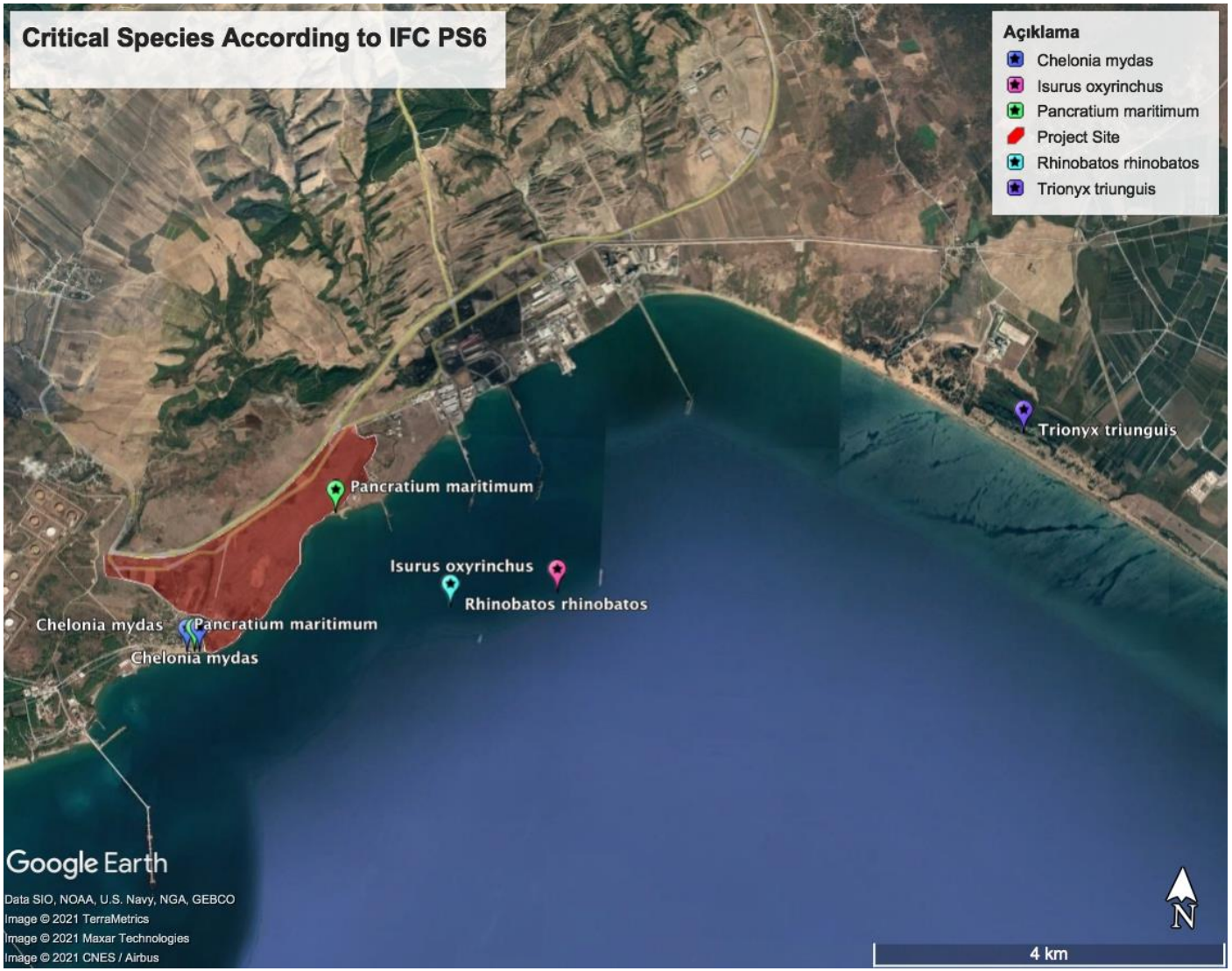

Figure III. 3. Areas with critical species observed during studies

III.5. OTHER HIGH CONSERVATION STATUS SPECIES

According to the samplings made in the project area and the literature information, some other species with high protection status were also observed in the evaluations made about the other species found in the project area and its immediate surroundings. There are a total of 19 species included in this category, of which 17 are classified as VU and 2 are classified as NT. Of these species, 1 was recorded as reptile, 2 as bird, 3 as mammal, 11 as fish and 2 as marine mammal. 7 of these species were sampled by us in the field studies, and their numbers and coordinates were given.

Although these species are not defined as critical species within the scope of IFC, the localities where they were observed in this study are given in Table III.3 and Figure III.4.

Table III. 3. Other species with high conservation status according to the IUCN Red List

	IUCN Protected Species	Coordinates	Number	Observed Location
Reptules	*Testudo graeca* (VU)	762922.36 E 4087884.98 N 764523.47 E 4089155.33 N 762859.85 E 4087338.47 N	3	
Birds	*Neophron percnopterus* (VU)			Literature
	Streptopelia turtur (VU)	762971.07 E 4087027.28 N	1	
Terrestrial Mammals	*Rhinolophus mehelyi* (VU)			Literature
	Myotis capaccinii (VU)			Literature
	Vormela peregusna (VU)			Literature
Fish	*Mustelus mustelus* (VU)			Literature
	Dasyatis pastinaca (VU)	762645.56 E 4086331.21 N 762968.88 E 4086412.64 N 764331.35 E 4086964.01 N 764949.93 E 4087211.51 N	4	
	Bathytoshia centroura (VU)			Literature
	Myliobatis aquila (VU)	763144.60 E 4086479.69 N	1	
	Raja clavata (NT)			Literature
	Merluccius merluccius (VU)	765134.46 E 4087270.46 N 765361.42 E 4087331.30 N 766817.86 E 4087869.90 N	3	
	Sciaena umbra (VU)			Literature
	Umbrina cirrosa (VU)	766373.88 E 4087714.87 N	1	
	Dentex dentex (VU)			Literature
	Dicentrarchus labrax (NT)	763713.99 E 4086682.54 N 763854.22 E 4086781.90 N 767057.48 E 4088024.34 N	3	
	Pomatomus saltatrix (VU)			Literature
Marine Mammals	*Stenella coeruleoalba* (VU)			Literature
	Balaenoptera physalus (VU)			Literature

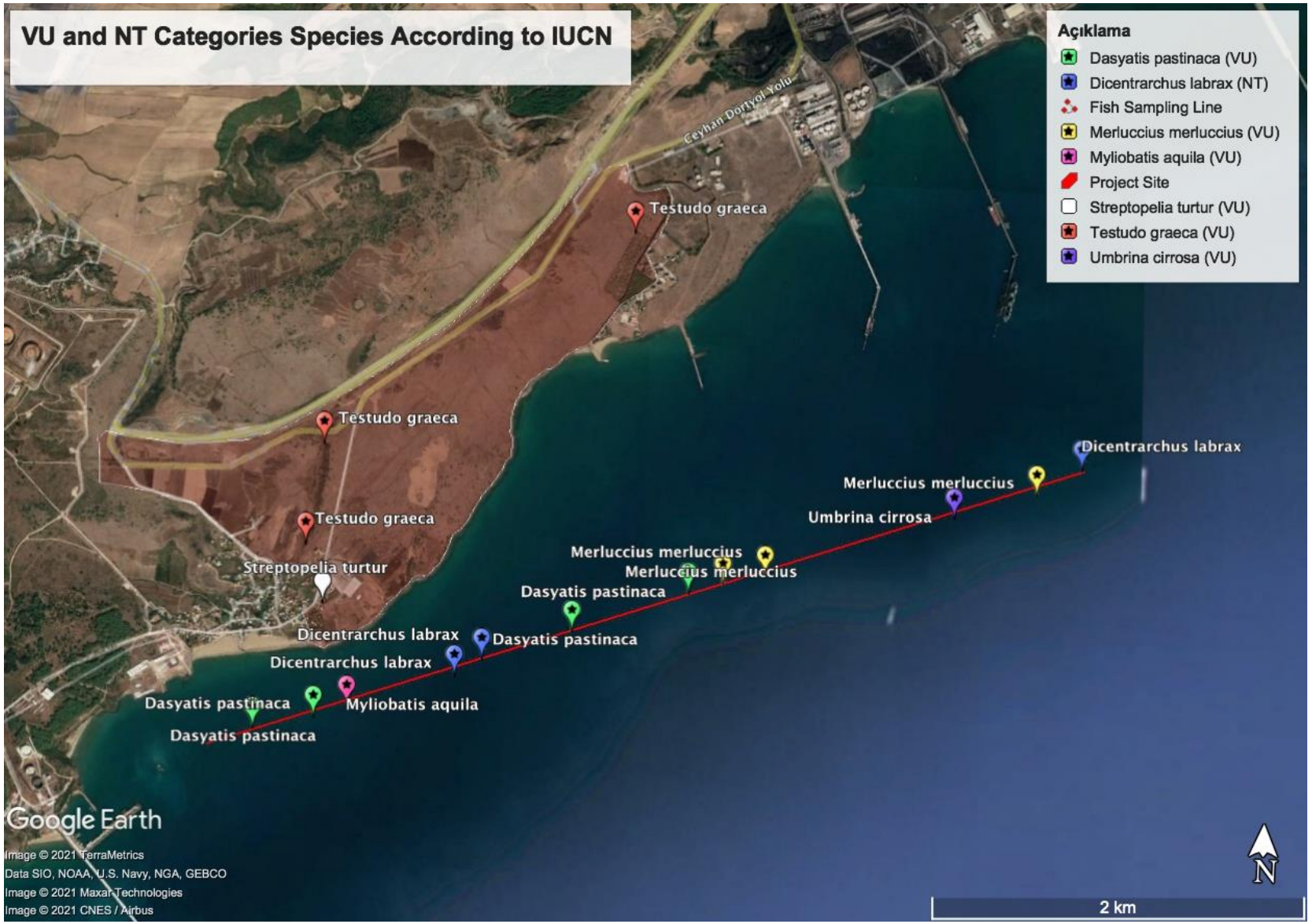

Figure III. 4. Areas where species with high conservation status in the IUCN lists were observed within the project area

III.6. IMPACTS, MITIGATIONS AND MONITORING

III.6.1. GENERAL OVERVIEW ON THE RISKS

This section describes general measures for all priority biodiversity features as well as risks associated with the wider biodiversity conditions. The following general risks may arise as a result of project activities, both during construction and operation:

- The area may experience habitat loss, habitat degradation, damage to species and loss of nesting sites, with wider indirect and cumulative impacts. The construction of facilities in the terrestrial and marine environment can result in a long-term increase in the human population in the region. There may also be an increase in buildings, infrastructure, facilities and services that may cause increased light effects and noise disturbance and similar effects.
- Habitat loss, habitat degradation, species damage, and poaching associated with increased field personnel numbers, particularly impacts associated with the uncontrolled activities of local workforces that may be brought into the area.
- The potential for habitat degradation on land and sea may arise due to pollution.

III.6.2. MEASURES

It is aimed to carry out the long-term management of terrestrial and marine areas in good conditions by reducing the risks to biodiversity. Such studies include the management of direct, indirect and cumulative impacts. In addition to providing general measures to prevent, minimize and restore impacts on critical habitat, the following recommendations and measures are being taken to achieve net gains or to restore them to their original state.

- To prevent long-term degradation of critical habitat.
- Minimizing the potential for cumulative effects.
- To prevent damage to priority biodiversity features.
- To protect and improve the habitats of priority biodiversity elements.

The strategy for mitigation measures is summarized in the table below (Table III.4).

Table III. 4. General measures to address risks to priority biodiversity species

Stage of the Mitigation Hierarchy	Mitigation Actions	Responsibility	Timing	Frequency	Verification
1	**Avoidance through staff training and awareness**				
	1. All office and field personnel should be informed to minimize damage to wildlife and prevent habitat degradation. There should be a training plan outlining acceptable practices and constraints. All staff should be trained to understand the region's biodiversity values, action and individual responsibilities. To this end, a Staff Awareness and Training Plan should be developed, including appropriate procedures and relevant forms. The training to be given to the staff should also include the following; • Prevention of interference with wildlife, including hunting, touching or gathering of visible biodiversity features, • Prohibition of recreational activities, including fishing, in and around the port, • Penalties for staff and contractors who ignore the code of conduct, • Developing monitoring and enforcement strategies for the protection of priority habitats and species	Renaissance	Pre-Construction	Continually	Staff Awareness and Training Plan Education records Communication and education
2	**Avoiding wider indirect impacts from increased land and ship traffic and port expansion**				
	1. It is recommended to liaise with local external stakeholders, including research groups, to prevent habitat degradation and species impact in protected areas and terrestrial areas that may provide habitat for priority species in the port area. With the contribution of biodiversity consultants, management plan for	Renaissance	Pre-Construction	Continually	Job Descriptions Meeting recordings

	protected species, determination of management responsibilities, monitoring approaches, information sharing etc, job Descriptions should be created. This working group should also continue long-term monitoring for the protection of priority biodiversity features. Therefore, long-term monitoring should be coordinated through the working group, including indirect impacts from land facilities and port construction and operations.				
3	**Care should be taken to ensure that the designs of structures to be built in terrestrial and marine environments are compatible with biological life.**				
	1. Wherever possible, priority habitats should be avoided. For this reason, it is important not to interfere with the small beach areas on the Incirli Beach and Toros Fertilizer side. Both beaches harbor critical species such as *Chelonia mydas* and *Pancratium maritumum*. 2. As part of the ongoing design phase, it is important to avoid impacts to nesting turtles, in situ nests and hatchlings, and to avoid impacts on sand habitat. 3. Before construction activities begin, a GIS-based study should be undertaken to mark identified areas prior to any work that requires plant and animal transport. 4. In order to reduce underwater and airborne sound effects, first of all, machines with advanced technical features should be used. Hole pile, vibro-pile or gravity pile are less noisy and will likely eliminate the possibility of harmful effects. Any technique that can be used can still cause disturbance to marine life and produce sound levels similar to ships. In addition, additional measures must be taken to minimize noises.	Renaissance	Pre-Construction	Continually	Detailed design and construction plans GIS database
4	**Kirlilik azaltma ve acil müdahale planlarının benimsenmesi yoluyla etkilerin önlenmesi ve en aza indirilmesi**				
	1. Environmental plans including Pollution Prevention and Control Plan, Integrated Waste Management Plan, Monitoring and Evaluation Plan and so on should be compatible with	Renaissance	Pre-Construction	Continually	Monitoring Records

	Biodiversity Action Plan and these plans should include the following measures. • Prevention of soil, sediment and water quality pollution on land and sea should be ensured. • Proper storage and transportation of materials must be ensured. • No waste or other material should be dumped, especially in critical habitat areas and distribution areas of critical species. • Active intervention should be made to eliminate waste that may have a negative impact on wildlife. • It must be ensured that the equipment is in good condition. • It should be ensured that there is no ballast water discharge in the port area and ballast water should be managed in accordance with the International Convention on the Control and Management of Ship Ballast Water and Sediments (IMO). • There should be no wastewater discharge to the local environment. • Drainage management should be established to prevent direct discharges to the marine environment and priority habitat areas. • Garbage bins should be placed at the project site and facility areas, and garbage disposal in areas should be prohibited. • Appropriate emergency response procedures should be established for accidental spills. • Airborne noise reduction guidelines should be implemented according to standards. Measures to address impacts on human populations will also reduce impacts on wildlife. Noise monitoring, which can be combined with bird monitoring during construction, should also be undertaken together. Bird watching studies should be continued during construction to determine if there is any noise impact on critical bird species, migratory and				

	breeding species identified in the Project site and impact area. In case any impact is recorded, adaptive management approaches should be adopted and solutions regarding the noise source should be produced. • Dust reduction practices should be implemented to minimize dust generation from transportation activities.				
5	**Minimization through raising awareness of the local community and local participation**				
	1. A communication strategy should be developed to provide education and awareness on biodiversity measures with local stakeholders, including project-affected communities and fishermen. This should be led by a team of public relations and social experts to manage local liaison. The aim should be to raise community awareness of local biodiversity values, actions undertaken by Renaissance and its partners for the management of biodiversity impacts, to support local community members who may want to sustain local biodiversity value and ecosystem services. This should be defined as a Stakeholder Engagement Plan (SEP) to inform whom, how and when to consult during the mitigation strategy, implementation and evaluation phases. The SEP should also include information on how the results of the consultation will be shared transparently between the operator and the stakeholders.	Renaissance	Pre-Construction	Continually	Social Impact Assessment Plan Meeting Records
6	**Minimization through monitoring**				
	1. All monitoring measures within the scope of this study should be implemented and compiled as a Monitoring and Evaluation Plan. The intent of this plan is to include all the details of the proposed monitoring approach for construction and operation, including the proposed species-specific monitoring.	Renaissance	Pre-Construction	During Construction	Monitoring and Evaluation Plan
7	**Balancing lasting impacts on critical species that need protection**				

	1. In order to assess potential gains through balancing activities for important biodiversity elements, pre-feasibility studies should be conducted with specific emphasis on species such as sea turtle nesting can continue, critical plant species can be transported to suitable habitats by transferring them to appropriate habitats and implementation of projects to increase their density there. This should be in collaboration with key local stakeholders for planning, evaluation and implementation. Pre-feasibility studies should consider: • Balancing options. • Land on which balancing activities can be carried out. • Cost • Establishing a management and economic structure for balancing 2. A Balancing Implementation and Evaluation Plan should be developed after the pre-feasibility studies are completed. 3. It is recommended that any balancing strategy be developed and presented with local stakeholders. These proposed offset plans should align with and not contradict the goals and objectives of the Biodiversity Working Group.	Renaissance	Pre-Construction	During Construction	Offset Uygulama ve Değerlendirme Planı ve dengelemenin gösterilmesi

III.6.3. MONITORING THE IMPLEMENTATION OF GENERAL MEASURES

Below are the monitoring targets for each of the overall measures identified, including the Key Performance Indicators (KPI) and related targets.

1. Avoidance through staff training and awareness			
Key Performance Indicators		Target	Record
KPI_1	Percentage of new staff and contractors trained	%100	Education records
KPI _2	Number of personnel non-compliance cases	Zero	Staff records

2. Avoiding wider indirect impacts from increased land and ship traffic and port expansion			
Key Performance Indicators		Target	Record
KPI _3	Additional cumulative development or degradation of critical habitat or species from the port and associated facilities behind the port, increased land and ship traffic	Zero	Habitat and development maps, verification of impacts from field monitoring
KPI _4	Percentage of Biodiversity Working Group activities implemented	%100	Job descriptions, Study Plans and Meeting records
KPI _5	Percentage of local stakeholders aware of port restrictions	%100	Social Impact Assessment, Education and Community Awareness Records

3. Care should be taken to ensure that the designs of structures to be built in terrestrial and marine environments are compatible with biological life.			
Key Performance Indicators		Target	Record
KPI_6	Critical habitat size affected by the project	Zero	Field verification and monitoring records

4. Preventing and minimizing impacts through the adoption of pollution reduction and emergency response plans			
Key Performance Indicators		Target	Record
KPI _7	Reducing nesting abundance and success	Zero	Field verification and monitoring records

5. Preventing and minimizing impacts through the adoption of pollution reduction and emergency response plans			
Key Performance Indicators		Target	Record
KPI _8	Reducing nesting abundance and success	Zero	Field verification and monitoring records

6. Minimization through raising awareness of the local community and local participation			
Key Performance Indicators		Target	Record
KPI_9	Percentage of Stakeholder Engagement activities implemented	%100	Social Impact Assessment

7. Minimization through monitoring			
Key Performance Indicators		Target	Record
KPI _10	Decrease in the population status of the species	Zero	Field verification and monitoring records

8. Balancing lasting impacts on critical species that need protection			
Key Performance Indicators		Target	Record
KPI _11	Number of priority species in new balancing areas	To meet the balancing implementation plan	Field verification
KPI _12	Established Balancing	To meet the balancing implementation plan	Balancing execution plan and monitoring to determine net gains

III.7. DEFINITIONS BY CRITICAL SPECIES

In this section, precautions have been defined for critical species observed in and around the area.

III.7.1. FLORA SPECIES

Critical habitat assessment was carried out for two plant species in the project area. Of these species, Pancratium maritimum grows on the Mediterranean, Marmara and Black Sea coasts in Kırklareli, Istanbul, Bolu, Sinop, Samsun, Giresun, Trabzon, Antalya and Adana. The other species, Cyclamen persicum, is a perennial herbaceous geophyte with 15 cm diameter tubers. This plant, which blooms between February and April, grows in evergreen oak maquis, red pine forests, on open and limestone slopes, up to 800 m above sea level. Apart from Adana, it also spreads in Cesme, Kusadasi, Alanya and Hatay in Turkey.

III.7.1.1. GENERAL OVERVIEW ON THE RISKS

Some key impacts associated with project activities include:

- Damage to the habitats where the species is distributed due to the construction of the facilities.
- Damage to plant bulbs during vegetative soil stripping

The strategy of measures regarding flora species is summarized in the table below (Table III.5).

Table III. 5. Risks and precautions for critical flora species

Stage of the Mitigation Hierarchy	Mitigation Actions	Responsibility	Timing	Frequency	Verification
1	**Conservation of species in their natural habitats will be carried out (in-situ conservation)**				
	1. Before the work starts in the project impact area, the relevant areas will be scanned by the expert botanist to investigate the presence of the relevant critical habitat types and rescue studies will be carried out. 2. In areas determined to contain species that will be directly affected by construction activities, the bulbs of the species will be taken together with the topsoil during the topsoil stripping. 3. Both of these species collected from the activity area are species with bulbs, and these bulbs will be collected by expert personnel and replanted by transporting them to their natural environments, which have the same habitat characteristics and will not be affected by the project activities. Planting areas will be marked and protected. 4. In order to observe the adaptation and success of these species to their new areas, monitoring studies will be carried out by expert personnel in March-April for *Cyclamen persicum* and August-October for *Pancratium maritimum*. 5. The coordinates of the flora species taken from the areas determined to contain the species that will be directly affected by the construction activities were taken and the new areas would be determined in the monitoring studies. 6. Accordingly, the *Cyclamen persicum* species could not be directly observed due to field studies except for leaf and	Renaissance/Expert Botanist	Before and During Construction	Twice a year in March-April and August-October, which are the flowering periods.	Monitoring studies

	flowering periods, but it is known with its coordinates that records of this species were taken in the ESIA report and its presence in the project area. *Pancratium maritimum* species was observed from dune areas during the studies and was determined with 2 individual coordinates. 7. The number of individuals in planting areas should be planted and monitored until they reach losses in natural populations in the area and until net gains are achieved.				
2	**Conservation of species in culture media (ex-situ conservation)**				
	1. It should be ensured that the species are grown in pots so that there is no loss in the natural environment of the species and in order for the field personnel to recognize the species.	Renaissance/Expert Botanist	Before and During Construction	Twice a year in March-April and August-October, which are the flowering periods.	Monitoring studies

III.7.1.2. MONITORING THE IMPLEMENTATION OF MEASURES FOR FLORA SPECIES

Below are the monitoring targets for the measures for the identified flora species, including the Key Performance Indicators (KPI) and related targets.

1. Conservation of species in their natural habitats will be carried out (in-situ conservation)			
Key Performance Indicators		Target	Record
KPI _1	Decreased number of species in long-term monitoring studies	%0	Monitoring records

2. Conservation of species in culture media (ix-situ conservation)			
Key Performance Indicators		Target	Record
KPI _2	Increasing the number of collected from nature and grown in culture medium	%100	Monitoring records

III.7.2. FISH SPECIES

Seven different critical fish species have been identified in the project area and its immediate surroundings. Two of them were caught in the field studies carried out by us, and the other five, according to the literature, spread in the project sea area

III.7.2.1. GENERAL OVERVIEW ON THE RISKS

Some key impacts associated with project activities include:

- Damage to the habitats where the species spread due to scaffolding, dredging and filling works,
- Impact on species during construction and operation,
- Sediment density mixed with the water body during construction works,
- Underwater sound generation during construction and operation.

III.7.2.2. IMPACTS THAT MAY OCCUR IN THE CONSTRUCTION PROCESS

Since the marine study areas do not include the spawning areas of fish, no direct impact on fish is expected, but some sand dunes in the coastal and open areas may be directly affected.

- With the construction works, habitat losses that form the feeding areas of the fish will be seen.
- Some species that can be seen in filling and dredging areas may be directly affected during these studies.
- Primary production may be disrupted, as the sediment clouds that arise during construction work will prevent light from entering the water.
- The resulting sediment may accumulate on the gills of the fish and affect their respiration.
- The effects of noise and noise caused by construction works on fish can be observed, albeit limited.

Although no impact is expected due to the filling rocks during the operation phase, continuous monitoring studies should be carried out toing observe the cumulative and long-term effects. The effects of the operation phase are given in the table below (Table III.6).

Table III. 6. Risks and precautions for fish

Stage of the Mitigation Hierarchy	Mitigation Actions	Responsibility	Timing	Frequency	Verification
1	**Avoidance by limiting construction activities, especially during the spring months when fish are breeding**				
	1. Taking into account the possibility of finding nests in the areas filled during the construction works, the filling works will be carried out especially in the rocky areas in the spring months. If this step is adopted, minimization measures will not be necessary. 2. If the above effect is not achieved, working close to the spawning area will be avoided at least during the breeding season. This is considered a secondary reduction step.	Renaissance and the Contractor	April to June	First two years	Detailed activity program
2	**Monitoring should be done to protect fish population status and nesting sites**				
	1. Monitoring studies will be conducted to determine nesting and fish species and densities in the study areas. During the monitoring studies carried out in the activity areas to be determined by the dives, no intervention will be made in the determined nesting areas and the eggs will be waited for the necessary time for them to hatch. 2. Especially the effects of noise that may arise during dredging on fish and noise modeling will be carried out. If the magnitude of the effects is found to be high, the propagation of the noise will be prevented by the air bubble system.	Renaissance and the Contractor	April to June	First two years	Monitoring and evaluation plan Monitoring
3	**Because sediment clouds block the penetration of light into the water, it can cause disruptions in primary production and adversely affect the respiration of fish species.**				
	1. Propagation models of the sediment to be formed will be made and the impact areas will be determined. 2. In order to prevent further spread within this impact area, silt curtains will be used to ensure that the sediment formed remains within a certain area.	Renaissance and the Contractor	April to June	First two years	Monitoring and evaluation plan Monitoring

III.7.2.3. MONITORING THE IMPLEMENTATION OF MEASURES FOR FISH

Monitoring targets for measures of identified fish species, including Key Performance Indicators (KPIs) and related targets, are provided below.

1. Avoidance by limiting construction activities, especially during the spring months when fish are breeding			
Key Performance Indicators		Target	Record
KPI_1	Damage to fish nesting areas	%0	Monitoring Records

2. Monitoring should be done to protect fish population status and nesting areas			
Key Performance Indicators		Target	Record
KPI_2	Uncontrolled damage to nesting areas	Zero	Saha doğrulama ve izleme kayıtları

3. Since sediment clouds will prevent light from entering the water, they may cause disruptions in primary production and adversely affect the respiration of fish species.			
Key Performance Indicators		Target	Record
KPI_3	Reduction in fish populations	Zero	Field verification and monitoring records
	Reduction in primary producers	Zero	Field verification and monitoring records

III.7.3. SEA TURTLES

Two species of sea turtles have been identified as a priority biodiversity species in the project area and its immediate surroundings, and therefore we have focused on these species. However, all recommended precautions apply to all turtle species.

III.7.3.1. GENERAL OVERVIEW ON THE RISKS

Some key impacts associated with project activities include:

- Effects of ongoing constructions and operations on the species,
- Light pollution caused by artificial lighting during construction and operation,
- Ship collisions during operation,
- Underwater sound generation during construction and operation.

The impacts of the project will be felt primarily in the coastal areas, which are the marine roaming areas and nesting areas of turtles. The turtles leave the sea and head towards the beach to find a suitable nesting site. The locations of the beach nesting areas of the turtles are above the swells normally characterized as high water and normally extend to the primary dune. This area is classified as a turtle nesting area. Although the turtle nesting area is not located within the project area, it is located on İncirli beach, which is right on its border.

The current impacts on sea turtles are given below:

- Incidentally and/or deliberately catching sea turtles as a result of fishing activities,
- Collection of sea turtle eggs and potentially nesting females,
- Discomfort caused by recreational activities,
- Light transmission to the nesting beach from the nearby facilities,
- Beach litter, logs, etc., which prevent turtles and hatchlings from nesting.
- Predation by natural predators, pests (eg rats) and domesticated and wild/stray animals (eg dogs).

III.7.3.2. EFFECTS THAT MAY OCCUR DURING THE CONSTRUCTION PROCESS

Since no activity will be carried out on İncirli beach (which is the nesting area of the planned project), no direct impact is expected from the construction activities.

• Injury/death of adult turtles going to the nesting areas on the beach or injury/death of offspring moving towards the sea,

• Loss or damage to nesting habitat and/or nests,

• Man-made formations that may cause injury or death on nesting turtles and hatchlings and/or prevent turtles from nesting,

• Pollution and mess leading to injury, death or reduced quality of life,

• Off-duty activities of the workforce that cause nuisance through hunting and/or harassment and also result of potential use of lights/fires.

III.7.3.3. IMPACTS THAT MAY OCCUR DURING THE OPERATING PHASE INCLUDE THE FOLLOWING

Although no effect on the spawning beach is expected during the operation phase, continuous monitoring studies should be carried out to observe the cumulative and long-term effects.

III.7.3.4. MITIGATION

The overall objective of the proposed mitigation is to manage construction and operational activities to prevent or minimize impacts on the nesting coastal habitat, turtles, nests, eggs and hatchlings observed during the nesting process. The mitigation strategy is summarized in the table below (Table III.7).

Table III. 7. Risks and precautions for Sea Turtles

Stage of the Mitigation Hierarchy	Mitigation Actions	Responsibility	Timing	Frequency	Verification
1	**Avoidance by limiting construction activities during critically sensitive times, particularly during breeding seasons.**				
	1. There will be no work directly on the sea turtle beach during the construction works. However, activities should be timed so that the nesting period (or at least peak nesting periods) is avoided, as work will still be done in close quarters. The nesting period is from June to October. This is considered the primary reduction step. If this step is adopted, minimization measures will not be necessary. 2. If the above mitigation measure cannot be achieved, work should be avoided, at least, near the turtle exit or nesting sites during the night when turtles are most likely to nest or hatch. This is considered a secondary reduction step.	Renaissance and the Contractor	During construction	Once	Detailed activity program
2	**Monitoring should be done to protect sea turtle nests in areas that may be affected by the works.**				
	1. If the timing of the studies does not preclude the nesting season, monitoring will be required to protect the sea turtle nests in situ. Regularly locating new nests and assessing nesting success, protecting nests if appropriate, and preventing injury during night work should be carried out. The general process should be as follows: • In order to find new nests and evaluate nesting success, regular surveys should be conducted in areas that may be affected by the studies. These investigations should be in the form of protecting the nests and eggs until the hatchlings and precautions should be taken in advance.	Renaissance and the Contractor	Between June and September	First two years	Monitoring and evaluation plan Monitoring

	• Sea turtle nesting activities should be monitored by using the signs (track and nesting pits) left behind by turtles after leaving the sea at night and trying to nest (successfully or unsuccessfully), and daytime beach surveys should be carried out. • Since the project area does not directly affect the beach area, it will be possible to protect the eggs in the nesting areas that may occur, and to ensure the healthy exit of the young individuals from the eggs. Apart from this, due to construction activities, after nesting, the eggs will not be transported or left to another place. • If the nests are protected, they should be flagged and their locations should be included in a GIS database. Each nest must be covered with a nest cage and a separate nest code must be written for these cages.				
3	**Minimization through physical controls to protect sea turtle nesting sites**				
	1. No vehicle belonging to the project should be allowed to enter these areas, especially during nesting periods. 2. The sea side should not be blocked in order to ensure the uninterrupted movement of the hatchlings to the sea. 3. Avoid preventing the movement of adult turtles to their "nesting areas" with non-permanent structures.	Renaissance and the Contractor	Between June and September	First two years	Monitoring and evaluation plan Monitoring

III.7.3.5. MONITORING THE IMPLEMENTATION OF MEASURES FOR SEA TURTLES

Following are the monitoring targets for the defined sea turtle measures, including the Key Performance Indicators (KPI) and related targets.

1. **Avoidance by limiting construction activities during critically sensitive times, particularly during breeding seasons.**			
Key Performance Indicators		Target	Record
KPI _12	Reduction of nesting in the project area compared to long-term data	%0	Monitoring records

2. Monitoring should be done to protect sea turtle nests in areas that may be affected by the works.			
Key Performance Indicators		Target	Record
KPI _13	Uncontrolled damage to sea turtle nesting sites	Zero	Field verification and monitoring records

3. Minimization through physical controls to protect sea turtle nesting sites.			
Key Performance Indicators		Target	Record
KPI _14	Uncontrolled damage to sea turtle nesting habitat and nesting grounds	Zero	Field verification and monitoring records
	Preventing the movement of adults and juveniles	Zero	Field verification and monitoring records

III.7.4. EFFECTS OF POTENTIAL SHIP COLLISIONS ON SEA TURTLES

III.7.4.1. IMPACTS

In the marine area of the Project, vessels operating may collide with sea turtles, causing injury or death. Impacts will only occur in the offshore area where turtles interact with ships. In the related reports, it is stated that the increase in ship movements during operation will be relatively low. In addition, slow movement of ships is also considered as a mitigating effect against negative effects. Since there will be no ship traffic arising from the project during the construction, no adverse impact due to the collision is expected. Collision risks are not generally considered to be significant, but as some risks exist, mitigation measures can be taken.

III.7.4.2. MITIGATION

Complete prevention of impacts involves the observational detection and avoidance of turtles in the marine environment. Given the behavior of turtles, this is not possible and therefore minimization measures are recommended.

The strategy for countermeasures for the collision risk of Sea Turtles is summarized in the table below (Table III.8).

Table III. 8. Risks and precautions regarding ship collisions with sea turtles

Stage of the Mitigation Hierarchy	Mitigation Actions	Responsibility	Timing	Frequency	Verification
1	**Minimizing potential ship collision with sea turtles through operational controls**				
	1. All ship operators should be given a briefing, alerting them to the possible presence of sea turtles in the area and should be provided with guidelines for safe ship operation should such species be seen. Training of ship operators in the observation and recognition of sea turtles would likely be necessary. This should form part of the training exercise introducing the code of conduct for the port. An operational strategy for low boat speeds should be established and communicated to all ship pilots, followed up and implemented. During the main nesting season (June-September), vessels berthing both during the day and at night should be advised not to exceed 10 knots and all operators should be notified. 2. Ships should never deliberately approach, follow, or otherwise come into close contact with sea turtles. If sea turtles are seen approaching 50 m from the ship, ship speeds should be limited to the trailing speed. If necessary, the ship's route should be changed if it is safe to do so. 3. The sightings of sea turtles near ships should be recorded by the ship operators and any incidents should also be reported to the Renaissance	Renaissance and all ship operators	Construction and Operation phases	Continually	Monitoring and evaluation plan

III.7.4.3. MONITORING THE IMPLEMENTATION OF PRECAUTIONS FOR THE RISK OF POTENTIAL SHIP COLLISIONS WITH SEA TURTLES

Following are the monitoring targets for the defined sea turtle measures, including the Key Performance Indicators (KPI) and related targets.

1. Minimizing potential ship collision with sea turtles through operational controls			
Key Performance Indicators		Target	Record
KPI_13	Number of ships colliding with sea turtles	%0	Monitoring records
KPI _14	Percentage of ship crew trained on sea turtles	100%	Induction and training records

III.7.5. EFFECTS OF UNDERWATER SOUND PRODUCTION ON SEA TURTLES

III.7.5.1. IMPACTS

Underwater sound production from construction work may cause females not to nest or to leave their nesting areas.

During construction and operation, especially during port construction, during filling, dredging and pier constructions, and all marine activities that may cause noise under water due to ship propellers, may cause some effects on sea turtles. Too much underwater sound production can cause sea creatures to fail to lay eggs and/or avoid nesting.

III.7.5.2. MITIGATION

The overall aim will be to ensure that sea turtles continue to nest in the same or increasing numbers in and around the project area. It is also to develop mitigation strategies and manage construction and operation activities accordingly.

Supporting objectives are:

- To prevent injury to sea turtles from noisy construction activities,
- Limiting discomfort during nesting periods,

The mitigation strategy is summarized in the table below (Table III.9).

Table III. 9. Risks and precautions regarding underwater sound production for Sea Turtles

Stage of the Mitigation Hierarchy	Mitigation Actions	Responsibility	Timing	Frequency	Verification
1	**Avoidance by adjusting the timing of underwater activities during nesting periods**				
	1. "Potentially the greatest concern of "noisy" activities occurs when driving scaffolding piles and during dredging. While planning the port construction, it is necessary to use the pier piles that have the qualifications to produce minimum noise. This is considered the primary reduction step. If these measures are implemented, it will not be necessary to avoid construction activities during the nesting season as a secondary avoidance step. 2. There is limited assessment of the effectiveness of mitigation measures used to protect sea turtles from underwater sound. The effect of underwater sound on sea turtles is different from that of marine mammals and therefore the effectiveness of measures taken for turtles is uncertain. Therefore, a strategy of avoiding such activities during the nesting season is recommended, unless "noise-induced" activities are avoided.	Renaissance	Pre-construction	Throughout the construction	Detailed calendar of activities

III.7.5.3. MONITORING THE IMPLEMENTATION OF MEASURES REGARDING THE EFFECTS OF UNDERWATER NOISE PRODUCTION ON SEA TURTLE

Following are the monitoring targets for the defined sea turtle measures, including the Key Performance Indicators (KPI) and related targets.

1. Avoidance by adjusting the timing of underwater activities during nesting periods			
Key Performance Indicators		Target	Record
KPI_15	Reduction of nesting in the project area compared to long-term data	%0	Monitoring records

III.7.6. MEDITERRANEAN SEAL

The Mediterranean Monk Seal has been identified as a priority species and therefore this species has been focused on. However, the effects are not unique to the Mediterranean Monk Seal, they can apply to any marine mammal species that can be found in offshore waters.

III.7.6.1. GENERAL OVERVIEW ON THE RISKS

The followings describe the main impacts on the monk seals and include recommendations for mitigation and monitoring. Pollution issues are addressed under the general measures above. Below is a discussion of other significant impacts and recommendations for mitigation and monitoring.

Current impacts on the Mediterranean Monk seal are likely to include:

- Disturbances caused by underwater sound produced by ships
- Ship collision potential.

III.7.6.2. UNDERWATER SOUND PRODUCTION

All marine activities that may produce underwater noise during construction and operation may have some impact. However, construction activities that may cause noise are related to the driving of pier piles, dredging and increased ship movements during operation. The noise effect that may occur with the driving of scaffold piles can be reduced by the construction technique to be used. The measure to reduce the noise effect that may occur with the driving of piles is closely related to the material to be used. There will not be a significant increase in ship traffic and will remain at a relatively low level, so no significant impacts are expected in terms of noise from the propellers.

Marine mammals in coastal waters include low and mid frequency hearing Cetaceans, which are sensitive to sounds that may be produced by project activities. There is also a potential for the Mediterranean Monk Seal to be found in areas where construction works will take place, as well as in areas where ship movement may increase.

Possible impacts on marine mammals are given below:

- Physical: includes damage to body tissues and ears, permanent temporary hearing loss and chronic stress effects that can lead to decreased vitality.

• Perceptual effects: masking of biologically important sounds (e.g. sounds related to communication signals, echolocation and navigation, hunting, avoidance of natural or man-made threats).

• Behavioral effects: impaired foraging, avoidance of certain areas, altered diving and breathing patterns, and disruption of mating systems.

• Indirect effects: Reduction in hunting rates

III.7.6.3. MITIGATION

The overall aim is to manage construction and operational activities through the adoption of mitigation to ensure that the same or increasing numbers of Mediterranean Monk Seal are found in and around the project area. Supporting objectives are:

• To prevent injury to Mediterranean Monk Seal from noisy construction activities,

• Limiting disturbance if it wanders in the area.

The mitigation strategy is summarized in the table below (Table III.10).

TABLE III. 10. Risks and precautions regarding the Mediterranean monk seal

Stage of the Mitigation Hierarchy	Mitigation Actions	Responsibility	Timing	Frequency	Verification
1	**Avoidance by adjusting the timing of underwater activities**				
	1. Of all the "noisy" activities, potentially the greatest concern is when driving scaffolding piles and during dredging. While planning the construction, it is necessary to use the scaffolding piles that have the qualifications to produce minimum noise. 2. For the Project area, the effects of underwater noise disturbance due to ship movements are not expected to be much greater than the current situation. For this reason, long-term monitoring of the Mediterranean monk seal should be carried out in order to observe the negative effects caused by increased ship movements. Based on the results to be obtained from this, management approaches, limitations on ship movements and similar effects may be considered.	Renaissance	Pre-Construction	During Construction	Detailed Plan of Construction Activities Environmental Management Plan
2	**Minimization of underwater sound effects through operational control**				
	1. Less noisy piles should be used instead of scaffolding piles, which can cause harmful effects and make a lot of noise. JNCC guidelines, which are considered to include the best applications, should be followed to minimize the risk of injury to marine mammals from piling activities (JNCC, 2010): • Working in the marine environment at night should be avoided. No work should be done when visibility is low. • Before starting work from an elevated observation point on land, an impact zone with a radius of 500 m should be scanned around the study area for at least 30 minutes. If cetaceans are observed in the vicinity of the study area, these studies should be delayed until the mammal leaves the area or 20 minutes after the last visual or acoustic detection. This measure will ensure that the area near the works is	Renaissance and the Contractor	During the hammering of the scaffold legs	Continually	Monitoring and Evaluation Plan

	clear of marine mammals prior to the start of the works and no disturbance has been caused to the marine mammals. • A gradual increase in the driving of scaffolding piles (soft start) is recommended as a way to reduce the risk of injury by allowing time for individuals to move away from the area. The soft start process must be for not less than 20 minutes. • Training of all construction personnel on the potential impacts of the activities on marine mammals should take place prior to the commencement of the works. • Entry and exit movements of ships to the construction area or operational port should be arranged according to the determined routes/approach channels.				

III.7.6.4. MONITORING THE IMPLEMENTATION OF MEASURES REGARDING THE MEDITERRANEAN SEALS

Following are the monitoring targets for the defined sea turtle measures, including the Key Performance Indicators (KPI) and related targets.

1. Avoidance by adjusting the timing of underwater activities			
Key Performance Indicators		Target	Record
KPI_16	Number of injuries damaging the Mediterranean monk seal	%0	Monitoring records

2. Minimizing underwater sound effects through operational control			
Key Performance Indicators		Target	Record
KPI _17	Reduction of Mediterranean Monk Seal numbers in the Area of Influence compared to long-term data	%0	Monitoring records

III.7.7. EFFECTS OF POTENTIAL SHIP COLLISIONS ON MEDITERRANEAN SEALS

III.7.7.1. IMPACTS

Any increase in ship movements creates a greater risk of collision that could result in injury or death. Marine mammals such as the slow-moving whale are particularly vulnerable. Ships using the Project's port area are expected to move slowly.

III.7.7.2. MITIGATION

The overall aim is to detect Mediterranean Seals in the path of ships in motion (if possible) and take measures to minimize the risk of collision and subsequent injury or death.

The mitigation strategy is summarized in the table below (Table III.11).

Table III. 11. Risks and precautions in terms regarding potential ship collisions for Mediterranean monk seal

Stage of the Mitigation Hierarchy	Mitigation Actions	Responsibility	Timing	Frequency	Verification
1	**Planning**				
	1. At night when visibility is limited and in cloudy weather, marine mammals are at increased risk of being killed or injured by ship collision. 2. Under this project, the risk of ship collision is unlikely to increase significantly. Therefore, a sustainable monitoring and management approach is considered reasonable. However, the plans should be revised according to the data to be obtained from the monitoring studies.				
2	**Mitigation through operational controls**				
	1. All ship operators involved in the studies should be given a briefing alerting them to the possible presence of marine mammals in the area and should be provided with guidelines for safe ship use in the presence of such species. Guidance should include: • Ships must enter and exit the port using designated routes/approach channels. An operational strategy for low boat speeds should be communicated to all ship operators and followed and implemented. During the breeding season, ships should use the 10 knot speed limit when berthing in port, both during the day and at night. • Ships should never deliberately approach, follow, or in any way come into close contact with marine mammals. If cetaceans are seen in a 50 m radius area of the ship, ship speeds should be limited to the trailing speed. If necessary, the ship's route should be changed if it is safe to do so. • Ships must not deliberately enter within 100 m (50 m for dolphins) of cetaceans and/or stand in front of the direction of movement of a cetacean or group of cetaceans. • Injury or death of marine mammals should be documented and reported. • All observations of cetaceans should be recorded and added to a GIS database.				

III.7.7.3. MONITORING THE IMPLEMENTATION OF PRECAUTIONS FOR THE RISK OF POTENTIAL SHIP COLLISIONS WITH MEDITERRANEAN SEALS

Following are the monitoring targets for the defined sea turtle measures, including the Key Performance Indicators (KPI) and related targets.

1. All mitigation measures			
Key Performance Indicators		Target	Record
KPI_18	The number of ships colliding with the Mediterranean Monk Seals	%0	Monitoring records

2. Mitigation through operational controls			
Key Performance Indicators		Target	Record
KPI_19	Percentage of ship operators trained in cetacean identification	%100	Induction and training records

III.8. PERMANENT IMPACTS AND NET INCOME ANALYSIS

III.8.1. APPROACH TO ACHIEVE NET INCOME TARGETS

Adoption of the proposed mitigation measures will mean that no significant adverse impacts will occur. However, as stated, the project site is located within a critical habitat area for some important species using the area and some lasting impacts are expected. Therefore, there is a need for net gains for the critical habitat features affected. It is possible for this to happen through balancing as the final step in the mitigation hierarchy.

The main permanent impacts are given below:

- Noise disturbance from surface and underwater that will continue through activities. All significant noise impacts will be avoided, but minor impacts will persist despite implementation of mitigation measures.
- Even if the most effective measures are to be adopted to prevent and minimize the impacts and consequences during construction and operation, there is the potential for pollution events to occur. However, even if a minor pollution event does occur in the marine environment, this is a potentially irreversible effect and may therefore lead to some small-scale permanent effects.
- There is the potential for wider long-term indirect and cumulative effects to occur. Mitigation measures have been proposed to address these, but not all impacts are likely to be managed. Therefore, some lasting effects can be expected.
- Avoidance and minimization measures are suggested in the relevant tables to address minor impacts during construction and operation. While slight adverse events can be avoided during construction, this is unlikely to be entirely possible during operation. However, the effects will be minor if the recommended mitigation methods are adopted.
- There will be no direct impact on the dune areas adjacent to the project site and no habitat loss is expected in these areas. Although these areas are not considered important and high numbers of nesting habitats for sea turtles, nesting does occur here and therefore long-term residual effects are based on the results of monitoring studies.
- There will be habitat loss in marine sand and mud habitats and coastal rocky areas during the filling, dredging and placement of piers in the marine ecosystem dimension of the

works. Although there are habitat losses in these areas, biodiversity records are expected to be small in these sand and mud areas.

A standard approach for identifying lasting impacts is to use a habitat quality metric. This metric combines habitat area with ecological conditions to determine lasting impact. This is then used to define the offsetting scope required to generate net gains. Given the minor significance and/or uncertainty for some of the expected residual impacts, the use of the habitat quality metric to define overall offset strategies is not appropriate in this situation. Instead, a number of balancing approaches have been considered to generate net gains.

There are two main types of offsets that can be used to address lasting effects.:

- Restoration offsets designed to address past damage to biodiversity by promoting conservation interventions,
- Loss prevention offsets designed to improve conservation of biodiversity values.

The balancing strategy should include monitoring requirements to identify success and provide adaptive management to optimize results. It is also important to develop and present any offset strategy in consultation with the proposed biodiversity working group. It is essential that the balancing is carried out in coordination with the existing plans and programs and that there is a framework that allows implementation. It is also necessary to ensure that appropriate financing is available and that the offsetting approach is permanent to secure long-term net gains. As this framework has not yet been established, it is not possible or appropriate to fully define balancing strategies in this BAP (Biological Action Plan). However, some objectives for the offset strategy are as follows:

- The offsets should focus on addressing residual impacts on priority species identified in this BAP, with particular emphasis on addressing impacts on breeding and nesting species related to impacts in the project area and wider indirect impacts.
- Offset principles should be consistent with existing biodiversity strategies and management plans defined for protected areas in nearby areas.

Here are some possible offset options for the project:

- To provide support to monitoring programs against poaching of sea turtles and fishing activities in the critical habitat area where the project site is located and the adjacent

border İncirli beach and other nearby beach areas by cooperating with the existing local governments.

• Support local stakeholders to develop a program to manage and mitigate current fishing risks to increase nesting success for priority marine fish in the project area.

• There are rocky habitats in the project area that will disappear with the sea fill areas and have a nesting potential for fish. It is possible to regain the lost habitats by creating artificial reef rocky habitats by using similar, filling rocks on the sea-facing surface sections of the areas to be filled in response to the rocky areas to be lost. In addition, the fill reefs in the harbor breakwater areas have the potential to have artificial reef features that can be used as nesting, shelter and feeding areas for fish. Therefore, especially the rocky habitats that will be lost as a result of the works can be regained with artificial reefs to be formed by the rocks to be used in the filling areas. In the BAP, which can be revised in the following years by monitoring the biodiversity and fish populations in the filling areas with monitoring studies, artificial reef areas will be determined in the vicinity of the port after obtaining the necessary permits, and new rocky habitats will be gained by creating reef areas, nesting and breeding areas of fish by shedding block rocks.

• Support should be provided to local researchers for monitoring studies with instruments such as satellite devices to record sea turtle movements on nesting beaches, open sea movements during nesting periods, especially on beaches close to the project site (eg Incirli). This will help to understand the links between habitats and also help develop further conservation actions and strategies.

• A biodiversity working group consisting of expert personnel should be established to monitor the impacts and population conditions on the habitat and species of the region, especially on priority species. It is important to provide financing and coordination according to the monitoring programs to be prepared.

• In coordination with local partners, support should be provided to raise awareness in the local community about the area's biodiversity value and how to conserve features of interest.

• In order to improve the quality of this habitat for nesting sea turtles, the possibility of reducing disturbance on the İncirli beach should be explored.

This BAP should be reviewed periodically and any necessary revisions made to reflect changes or current information available. As a minimum, the BAP should be reviewed annually before, during and during construction.

III.9. BIODIVERSITY MONITORING PROGRAM

A comprehensive biodiversity monitoring program will be implemented throughout the land preparation/construction and operation phases of the Project. A provisional schedule for 2022 is given below (Table III.12).

Table III. 12. Biodiversity Monitoring Program for 2022

Aspects of Biodiversity		Fieldwork Scope and Timing
Terrestrial Flora	*Pancratium maritimum*	Individuals identified in the dune areas near the project area will be moved to safer areas/August-October
	Cyclamen persicum	Topsoil to be stripped will be stored separately/January and February Bulbs will be collected and moved to suitable areas/February-April Period
Reptiles	*Chelonia mydas*	Nesting potentials on beaches near the project area will be investigated/June-September Period
	Trionyx triunguis	No impact is expected as they are distributed in an area far away from the project site.
Fishes	*Isurus oxyrinchus*	The presence and population status of critical fish species in the project area in the spring and autumn periods will be determined /spring term-April and autumn term-September
	Aetomylaeus bovinus	
	Gymnura altavela	
	Raja radula	
	Rhinobatos rhinobatos	
	Anguilla anguilla	
	Epinephelus marginatus	
Marine Mammal	*Monachus monachus*	Survey and field studies will be conducted on marine mammals that can be observed in the project marine area/August
Fauna Elements	Small mammals nesting at the Project Site	Pre-construction will be checked by biodiversity experts and will be carried out in nests/moving animals/January and February
	Fauna species with low mobility *Testudo graeca* *Emys orbicularis*	Areas potentially vulnerable to construction impacts to be monitored by faunal experts during the pre-construction phase to ensure that they are relocated to suitable habitats when necessary, especially for fauna with low mobility/January and February

SECTION IV. CVs

AYDIN AKBULUT

1. **Date of birth : 08.06.1969**
2. **Nationality : TURKISH**
3. **Civil status : ACADEMIC FELLOW**
4. **Education :**

Institution [Date from - Date to]	Degree(s) or Diploma(s) obtained:
2012- present	**Prof.**, Hacettepe University, Faculty of Education, Department of Mathematics and Science Education, Biology Education
2012- 2014	**Prof.**, Hacettepe University, Faculty of Engineering, Department of Environmental Engineering
2004 - 2012	**Assoc. Prof.**, Gazi University, Science Faculty, Department of Biology
1995-2001	**PhD**, Hacettepe University, Science Faculty, Department of Biology, Hydrobiology
1991- 1994	**M.Sc**., Hacettepe University, Faculty of Science, Department of Biology, Hydrobiology
1987 - 1991	**B.Sc.,** Hacettepe University, Faculty of Science, Department of Biology.

5. **Language skills: Indicate competence on a scale of 1 to 5 (1 - excellent; 5 - basic)**

Language	Reading	Speaking	Writing
English	4	4	4

6. **E-mail: akbulut@hacettepe.edu.tr**

   akbulut1969@gmail.com

7. **Membership of professional bodies:**

   - The Turkish Society of Biology
   - The Society of Conservation of Turkish Nature
   - Ecological Research Society

8. **Other skills: (e.g. Computer literacy, etc.)**

   Windows, Microsoft Office 2003; Excel, Word, Power Point, Acrobat Reader, Open Ofis, Internet

9. **Present position:**

   Academic Fellow (Prof.) in Hacettepe University, Faculty of Education, Department of Mathematics and Science Education, Biology Education

10. **Years within the firm: ---**

11. **Key qualifications: (Relevant to the project)**

    - Freshwater algae, specially systematic of diatoms
    - Seasonal succession of freshwater algae, their biomass and interactions with other aquatic organisms
    - Organisms of aquatic ecosystems
    - Conservation and management of wetlands
    - Distribution of medicinal leeches (*Hirudo medicinalis*) in Turkey and their sustainable usage
    - Taxonomy and Ecology of Turkish Scorpiones
    - Natural environmental programs
    - Natural History Museums

12. Specific experience in the region:

Country	Date from - Date to
Turkey	1993- present

13. Professional experience

1. Biology and Conservation of Sea Turtles (*Caretta caretta*), General Directorate of Environment, 1989
2. Biological and Ecological Investigations of Five Wetlands having International Importance (Akşehir Lake, Karamuk Lake, Beyşehir Lake, Hotamış Marshes, Ereğli Marshes), Turkish Environmental Foundation, 1992-1993
3. Stock Assessment of Çıldır Lake, The Scientific and Technical Research Council of Turkey, 1991-1993
4. Management Plan of Sultan Marshes, United Nations (UNEP), 1993-1994
5. Evaluation of Limnological Parameters of Mogan Lake, Hacettepe University Research Fund, 1995-1997
6. Vertebrate Fauna of Turkey, Ministry of Environment, 1995-1997
7. Management Plan of Manyas Lake, Ministry of Environment, 1995-1997
8. Sustainable Utilisation of the Medicinal Leech, *Hirudo medicionalis*, in Turkey, Sanofi SA/AG, 1997-1999
9. Greater Istanbul Water Supply Project, Stage II Melen System, Ecological Survey, Istanbul Drinking Water Partnership, 1997-1998
10. Biological and Ecological Investigations of Wetlands having International Importance, Stage III (Salt Lake Basin), Ministry of Environment, 1997-1999
11. Sytematic Investigation of the Planktonic Bacillariophyceae (Diatom) in Some Lakes (Tuz Lake, Uyuz Lake, Çöl Lake, Tersakan Lake, Hirfanlı Dam Lake) of Tuz Lake Basin, Hacettepe University Research Fund, 1995-2000
12. Limnoecologic Investigations of Uluabat Lake, Ministry of Environment, 2000- 2001
13. Systematical and Biological Investigations of Scorpionidae Fauna of Turkey, Ministry of Environment, 2000- 2001
14. Limnoecologic Investigations of Uluabat Lake, The Scientific and Technical Research Council of Turkey, 2001-2004
15. Aquatic Survey of Gebze-İzmir Motorway (Phase I), Otoyol A.Ş., 2012
16. Sytematical Investigations of Algal Flora of Important Wetlands of South-East Anatolia, The Scientific and Technical Research Council of Turkey, 2001-2004

15. Method Statement for Opencut River Crossing (Altıgoz Creek At Km 1045.82), Monitoring Study, Çınar Engineering, 2004
16. Method Statement For Opencut River Crossing (Ceyhan Rıver At Km 1037+132.47), Monitoring Study, Çınar Engineering, 2004
17. Method Statement for Hasankale River Crossing, Monitoring Study, Çınar Engineering, 2004
18. Environmental Appraisal Report Of The Water Supply Line From Erzin Yanık Değırmen Well To Cmt, Monitoring Study, Çınar Engineering, 2004
19. Method Statement For Opencut River Crossing (Mercin River At Km 1055.318, Monitoring Study, Çınar Engineering, 2004
20. Method Statement for Posof River Crossing, Monitoring Study, Çınar Engineering, 2004
21. Method Statement for Kura River Crossing, Monitoring Study, Çınar Engineering, 2004
22. Project of Biological Diversity, Sultan Marshes, GEF-II, Republic of Turkey Ministry of Forestry, 2002- 2005
23. Database Study of CITES Species in Turkey, Ministry of Environment, 2003- 2005
24. Determination of Kaz Mountain Fauna (Balıkesir), The Scientific and Technical Research Council of Turkey, 2004-2006
25. Determination of Biodiversity of Kemaliye (Erzincan), The Scientific and Technical Research Council of Turkey, 2005-2008
26. Hydrobiological Researches for River Crossing on the Samsun-Ceyhan Crude Oil Pipeline, ENVY, 2007
27. Aquaculture Studies of Barbus esocinus, The Scientific and Technical Research Council of Turkey, 2006-2009
28. Hydrobiological Researches for River Crossing on the BTC Crude Oil Pipeline, ENVY, 2008
29. Ecological Studies within Isparta, Kızıldağ Natural Park, 1/25.000 Analytical Etude Project, 2003
30. Ecological Studies within Kovada Gölü Natural Park, 1/25.000 Analytical Etude Project, 2003
31. Ecological Studies within Gölcük Natural Conservation Area, 1/25.000 Analytical Etude Project, 2003
32. Hydrobiological Studies of Ergene Basin (Edirne) Environmental Management Master Project, 2004
33. Hydrobiological Studies of Ilısu Dam Biological Richness and Conservation, 2008-2009

34. A Scientific Journey to the Museum of Nature, The Scientific and Technical Research Council of Turkey, 2008-2010
35. Determination of the Biological Resource Use and Conservation Environmental Education in Kaz Lake (Tokat), The Scientific and Technical Research Council of Turkey, 2005-2008
36. Examination of algal flora of important wetlands in Southeastern Anatolia (Dicle Basin), The Scientific and Technical Research Council of Turkey, 2006-2009
37. Wetland Managment Plan of Kızılırmak Basin, Ministry of Environment, 2005-2006
38. Biological Monitoring Studies Using Diatom Indexes in Delice River and its tributaries (Kızılırmak Basin), Hacettepe University, Central Anatolia
39. Investigation of Paleoclimatic Perspective of Lacustine Archives of Sünnet Lake (Bolu-NW Anatolia) by using sedimantological, geochemical and paleoecological Instruments, Eskişehir Osman Gazi University, 2009-2010
40. Current Fisheries Status of Marine and Coastal Protected Areas in Five Special Environmental Protection Area and Ayvalik Islands Natural Park and Monitoring of Fisheries Restricted Areas of Gokova Bay (SPA), Ministry of Environment, 2010
41. Determination of the Diversity of Heteretrof Benthic Flagellate of Gala and Çıldır Lakes, The Scientific and Technical Research Council of Turkey, 2010-2012
42. Akdeniz İklim Kuşağındaki Sığ Göllerde Su içi Bitkilerin Yapısal Rolü ile Gelişimini Etkileyen Faktörlerin Geçmişte, Günümüzde ve Daha Sıcak Isınan Koşullarda Belirlenerek Uyum ve Azaltma Stratejilerinin Oluşturulması, Danışman, TÜBİTAK 110Y125, Danışman, (2010-2014).
43. Systematic and Ecological Investigation of Flagellates in Kozanlı Saz, Lake Meke and Acı Göl, Hacettepe Üniversitesi Bilimsel Araştırma Birimi, 4809 no'lu proje, Yardımcı Araştırıcı, (2010-2014).
44. Paleoclimatological Investigation of Mogan and Eymir Lakes (Ankara), TÜBİTAK 114Y557 4809 no'lu proje, Yardımcı Araştırıcı, (2015-2018).

14. Other relevant information (eg, Publications)

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2. Bayramoğlu, G., Acıkgöz, İ.E., Akbulut, A., Özalp, V.C., Arıca, Y.A., 2021, Production of algal oil from hot spring isolate of Kamptonema formosum: Biodiesel synthesis using immobilized lipase on magnetic diatomic particles, Chemical Engineering Research and Design (Accepted)
3. Dönmez, E.O., Ocakoğlu, G., Akbulut, A., Tunoğlu, C., Tunver, A., Görüm, T., Tün, M., 2021, Vegetation record of the last three millennia in central Anatolia: Archaeological and palaeoclimatic insights from Mogan Lake (Ankara, Turkey), Quaternary Science Reviews 262 (2021) 106973.
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5. Aghaalipour, E., Akbulut, A., Güllü, G., 2020, Carbon dioxide capture with microalgae species in continuous gas-supplied closed cultivation systems, Biochemical Engineering Journal, 163, 107741
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7. Akbulut, A., 2019, Prof. Dr. Ali Demirsoy Doğa Tarihi Müzesi (Kemaliye-Erzincan), Mavi Gezegen, Sayı 27:31-38.
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CURRICULUM VITAE

PERSONAL INFORMATION

Name : Galip AKAYDIN

Position : Prof. Dr.

Date of Birth : August, 01, 1961

Nationality : Turkish

Marital Status : Married

Address (Work) : Hacettepe Üniversitesi, Eğitim Fakültesi, OFMA Bölümü, Biyoloji Öğretmenliği Anabilim Dalı, 06800, Beytepe- Ankara / Turkey

Address (Home) : Nihavent Sokak, 2/4 Angora Evleri, Mutlukent Mahallesi, Çankaya, Ankara / Turkey

Telephone (Work) : (0-312) 2976774- 2978601

Fax : (0-312) 2976774

Telephone (Home) : (0-312) 2227836

Languages : Turkish (native)
German (excellent)
English (professional)

EDUCATIONAL BACKGROUND

2012 - ..... : **Prof. Dr.** in Biology Education, Faculty of Education Hacettepe University. Ankara / Turkey

2004 - 2012 : **Associate Professor** of Biology

1992 - 1996 : **Ph. D.** in Botany, Faculty of Science, Hacettepe University. Ankara / Turkey

1988 - 1991 : **M. Sc.** in Science Education, Faculty of Education Hacettepe University. Ankara / Turkey

1982 - 1987 : **B. Sc.** in Biology Education, Faculty of Education Hacettepe University. Ankara / Turkey

THESES

- **M.Sc. Thesis**. "Practical Demonstration of Topics in 1st year Lycee Biology Courses." Supervisor: Prof. Dr. Haluk Soran
- **Ph.D. Thesis**. " Flora of Ankara City." Supervisor: Prof. Dr. Sadık Erik

Language Courses:

1991 : Upper Intermediate Certificate Level German Course, Goethe-Institut. Mannheim, Germany.

1982 - 1983 : Intensive German Course Beginning - Intermediate, Hacettepe University. Ankara / Turkey

SCHOLARSHIPS

Pädagogische Hochschule Reutlingen, *Education program,* Reutlingen, Germany, July 1987.

Goethe Institut, German Course, Mannheim, Germany, July 1991.

Sibbalt Trust, *Research Program,* Royal Botanic Garden Edinburgh, England, July 2003.

2225 TÜBİTAK SCIENTIFIC EXCHANGE PROGRAMMES, Germany, July – August 2007.

EMPLOYMENT

2012 - ..... : Prof. Dr. : Hacettepe University, Faculty of Education, Dept. of Secondary Science and Mathematics Education (SSME), Biology Education Section, Beytepe, Ankara / Turkey

2005- 2012 : Associate Professor : Hacettepe University, Faculty of Education, Dept. of Secondary Science and Mathematics Education (SSME), Biology Education Section, Beytepe, Ankara / Turkey

1998-2004 : Assistant Professor : Hacettepe University, Faculty of Education, Dept. of Science Education, Biology Education Section, Beytepe, Ankara / Turkey

1988 - 1997 : Research Assistant : Hacettepe University, Faculty of Education, Dept. of Science Education, Biology Education Section, Beytepe, Ankara / Turkey

COURSES TAUGHT

OGK 111	History of Biology
BİÖ 239	General Biology I
BİÖ 246	General Biology II
BİÖ 270	Plant Morphology and Anatomy
BİÖ 341	Seedless Plants Systematic
BİÖ 343	Seedless Plants Systematic Lab.
BİÖ 344	Economic Plants
BİÖ 346	Micology
BİÖ 366	Seed Plants Systematics
BİÖ 368	Seed Plants Systematics Lab.
BİÖ 443	Weed Plants
BİÖ 477	Flora and Vegetation of Turkey
BİÖ 505	Plant Physiology
BİÖ 506	Biogeography

BİÖ 560 06	Alan Eğitiminde Araştırma Projesi

THESES SUPERVISED

M. Sc. Theses

Murat AVCI " The Importance And The Profile Of The Mycology Topics At The Schedule Of High School" Hacettepe University, 2001.

Şeyda BARANLI " Teacher's And Student's Opinions About Plant Physiology In High School Biological Curriculum" Hacettepe University, 2003.

Candan KEMALOĞLU " Analysis Of Misconceptions About Matter Transport In Plants On Biology Teacher Candidates" Hacettepe University, 2004.

Meltem MERT " Determination Of Consciousness Level Of High School Students On The Environmental Training And Solid Wastes Topics." Hacettepe University, 2006.

Edibe Özmen " Palynology And Some Morphological Studies On The Genus *Limonium* Miller (Plumbaginaceae) In Turkey." Hacettepe University, (Co-advisor) 2006.

Emine Burcu Yeşilyurt " A Study On Flora Of Hacıkadın Valley (ANKARA/TURKEY)" Ankara University Graduate School of Natural and Applied Sciences Department of Biology, (Co-advisor) 2008.

Barış Özüdoğru " Flora Of The Karababa Mountain (Sivas-Şarkışla)" Hacettepe University, (Co-advisor) 2009.

Gizem Çankaya "Folk Medicines of Kızılcahamam Region" Gazi University, Faculty of Pharmacy, (Co-advisor) 2009.

Ceren Arıtuluk "Flora and Folk Medicines of Tefenni (Burdur) District" Hacettepe University, (Co-advisor) 2010.

Ph.D. Theses

Yeşilyurt Emine Burcu "Taxonomical Studies on the Genus ***Helianthemum*** Adans. in Turkey" Hacettepe University, (Co-advisor) 2014.

Özüdoğru Barış "Phylogeny and Phylogeography of the Genus ***Ricotia*** L. (Brassicaceae)" Hacettepe University, (Co-advisor) 2015.

RESEARCH ACTIVITIES
Projects

1. " A Revisional Study on the Genus *Acantholimon* Boiss. (Plumbaginaceae) in Turkey." TUBITAK, TBAG- 1781.

2. " Revisional Studies on the Family *Plumbaginaceae* Juss. in Turkey." TUBITAK, TBAG-2195.

3. " Taxonomical Revision of the Genus *Salvia* L. (Labiatae) in Turkey" TUBITAK, TBAG-104T450.

4. "Revision of the Tribus *Triticeae* Dumort. (Gramineae) in Turkey" TUBITAK, TBAG- 105T171.

5. "The Effect of Experimental Laboratory Techniques in Biology Education" Hacettepe University, Prj. Nu. 05A704004.

6. " Creatıng a Collectıon of Vısual Materıal Related to the Plant Growıng on the Beytepe Campus of Hacettepe Unıversıty" Hacettepe University, Prj. Nu. 2014.

7. "Folk Medicine in Düzce and its Counties " TUBITAK, TBAG- 108T253.

8. "Folk Medicine Used in Tefenni (Burdur)ı" Hacettepe University, Prj. Nu. 0801301001.

9. "Pollen Morphology Studies with SEM Technique for in Turkey Spread Species Belong to ***Limonium*** Miller" Hacettepe University, Prj. Nu. 09D03601001.

10. "Creating a Collection of Herbarium Materials Related to the Plants Growing on the Beytepe Campus of Hacettepe Unıversity" Hacettepe University, Prj. Nu. 4846.

11. "Collection, Determination and Evaluation of Plants Growing in Districts of Ankara in the face of ***rapid urbanization"*** Hacettepe University, Prj. Nu. 010-D-02704001.

12. "Türkiye'de Yetişen *RICOTIA* L. (Brassicaceae) Taksonlarının Populasyon Yapılarının ve Dağılımlarının Belirlenmesi" Hacettepe Üniversitesi, BAB., Destek Projesi, Proje numarası: 011-D-03601002, Prof. Dr. Sadık Erik, **Yardımcı Araştırıcı:** Prof. Dr. Galip AKAYDIN.

13. "Recollection of plant specimens from the type locality in Ankara province and determination of their threat categories" Hacettepe University, Prj. Nu. 011-D-01704001.

14. "Ricotia L. (Brassicaceae) Cinsinin Filogeni ve Filocoğrafyası" Hacettepe Üniversitesi, BAB., Araştırma Projesi, Proje numarası, 01301704001, **Proje Yöneticisi**: Prof. Dr. Galip AKAYDIN.

15."Enrichment of the HEF herbarium in terms of educational and scientific examples I" Hacettepe University, Prj. Nu. 013 D05 704 001.

16. "Enrichment of the HEF herbarium in terms of educational and scientific examples II" Hacettepe University, Prj. Nu. 014 D05 704 003.

PUBLICATIONS
ARTICLES

1**.Akaydın, G.,** Soran, H. "Frequency of Educational Equipment in the Teaching of 1st year Lycee Biology Courses", *Hacettepe Üniversitesi, Journal of Education*, **7:** 229-239 (1992).
2. Erik, S., **Akaydın, G.** "An Interesting Record from the City of Ankara *Solanum cornutum* Lam." *Tr. J. of Botany* **19:** 167-169 (1995).
3. **Akaydın, G.,** Erik, S. "New Floristic Records for Square B4(Ankara)", *The Herb Journal of Systematic Botany* **3(2)**:105-112 (1996).
4. **Akaydın, G.,** Erik, S. "New Floristic Records for Square A4(Ankara)", *Hacettepe Üniversitesi, Journal of Education*, **12:** 211- 213 (1996).
5. **Akaydın, G.,** Soran, H. "Possibilites for Application of Topics Studied in Lycee Biology Courses", *Hacettepe Üniversitesi, Journal of Education,* **14:** 11-14 (1998).
6. **Akaydın, G.,** et al. " The Current Situation of Our Science Labs in Terms of Equipment in Our Lycees." *Hacettepe Üniversitesi, Journal of Education*, **19:** 1- 4 (2000).
7. Doğan, M., **Akaydın, G.** " A New Species Of *Acantholimon birandii* (Plumbaginaceae) From The Central Anatolian Steppe In Turkey, " *Nordic Journal of Botany,* **21:** (5), 481-484 (2001).
8. **Akaydın, G.,** Erik, S. " Flora Of Ankara City, " *Hacettepe Journal of Biology and Chemistry*, **31:** 35-93 (2002).
9. **Akaydın, G.,** Doğan, M. " A New Species Of *Acantholimon* Boiss. (Plumbaginaceae) From The Western Taurus Mountains, Turkey, " *Israel Journal of Plant Sciences*, **50:** 67-71 (2002).
10. Doğan, M., **Akaydın, G.** " A New Species Of *Acantholimon* Boiss. (Plumbaginaceae) From Turkey, " *Botanical Journal of the Linnean Society,* **138:** 365-368 (2002).
11. Doğan, M., **G. Akaydın,** " A New Species Of *Acantholimon* Boiss. (Plumbaginaceae) From Ankara, Turkey, " *Botanical Journal of the Linnean Society,* **140:** 443-448 (2002).
12. Doğan, M., **Akaydın, G.** " Two New Species In *Acantholimon* Sect. *Staticopsis* (Plumbaginaceae) From Turkey," *Annales Botanici Fennici*, **40:** 53-58 (2003).
13. Doğan, M., **Akaydın, G.** " An Undescribed Species Of *Acantholimon* Boiss. Sect. *Staticopsis* (Plumbaginaceae) From Turkey, With Some Notes On Its Ecolog, Conservation Status And Relationships," *Israel Journal of Plant Sciences,* **51:** 231-236 (2003).
14. Doğan, M., Duman, H. and **Akaydın**, **G.** "Taxonomy And Conservation *Acantholimon laxiflorum* Boiss. ex Bunge (Plumbaginaceae), "*Turkish Journal of Botany.* **27:** 447-452. (2003).
15. **Akaydın, G**. "A New Species Of *Acantholimon* Boiss. Sect. Staticopsis (Plumbaginaceae) From North Anatolia, Turkey" *Nordic Journal of Botany,* **22:** (6), 679-682 (2004).
16. Doğan, M., **Akaydın, G.** "Three new species with two flowered spikelets in *Acantholimon* (Plumbaginaceae) from East Anatolia, Turkey," *Botanical Journal of the Linnean Society,* **144:** 497-505. (2004).
17. Doğan, M., **Akaydın, G. "**A new species of *Acantholimon* Boiss. sect. *Glumaria* Boiss. (Plumbaginaceae) from Elazığ, Turkey," *Botanical Journal of the Linnean Society,* **149:** 351-356. (2005).
18. **Akaydın, G.**, Özmen, E. and Özüdoğru, B., " Flora of Ballıkayalar Valley (Gebze-Kocaeli)," *Science and Eng. J. of Fırat Univ*. **18** (3), 279-289 (2006).
19. **Akaydın, G.**, Çalışkan, G. and Yılmaz, E.B. " Flora of Beşkayalar Valley (Gölcük-Kocaeli)," *Science and Eng. J. of Fırat Univ*. **18** (4), 459-469 (2006).
20. Doğan, M., **Akaydın, G. "** Synopsis of Turkish *Acantholimon* Boiss. (Plumbaginaceae)," *Botanical Journal of the Linnean Society,* **154:** 397-419. (2007).
21. Doğan, M., **Akaydın, G.** ve D. Çakaroğulları, " Infrageneric Grouping of Turkish *Acantholimon* Boiss. (Plumbaginaceae) Assessed by Numerical Taxonomy", *Advances in Biological Research*, 1 **(3-4):** 85-91 (2007).
22. **Akaydın, G.** " A New Species of *Limonium* Mill. (Plumbaginaceae) from the Central Anatolian Salt Stepe, Turkey", *World Applied Sciences Journal*, 2 **(4):** 406-411. (2007).

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24. Kırmızıbekmez, H., Bassarello, C., Piacente, S., **Akaydın, G.** and I. Çalış "Flavonoid, Phenylethanoid and Iridoid Glycosides from *Globularia aphyllanthes*" *Z. Naturforsch.* 64b: 252-256 (2009).
25. Yeşilyurt, B.E., Kurt, L. ve **G. Akaydın**, "A Study on Flora of Hacıkadın Valley (Ankara/Türkiye)" *Biological Diversity and Conservation*, 1 (2) 25-52 (2008).
26. Aykurt, C. ve **G. Akaydın**, " Biyoloji Öğretmen Adaylarında Bitkilerde Madde Taşınması Konusundaki Kavram Yanılgıları" Kastamonu Eğitim Dergisi, 17(1), 103-110 (2009).
27. Sarper, F., **Akaydın, G.**, Şimşek, I. ve E. Yeşilada, An ethnobotanical field survey in the vicinity of Haymana town of Ankara province in Turkey., *Turkish Journal of Biology*, **33:** 79-88 (2009).
28. **Akaydın, G.** "Status of Biology Teachers in High Schools in Terms of Recognizing and Using Laboratory Tools and Equipments**"** *World Applied Sciences Journal*, 6 (5): 590-592 (2009).
29. **Akaydın, G. "**Recognition and Utilization Status of Laboratory Tools and Materials by the Primary School 8th Class Students" *World Applied Sciences Journal*, 6(5): 593-594 (2009).
30. Bağcı, Y., Doğu, S. and **G. Akaydın,** "*Acantholimon doganii* sp. nov. (Plumbaginaceae) with persistent circinnate leaf bases, a new species from Turkey" " *Nordic Journal of Botany*, **27:** 228-231 (2009).
31. Kahraman, A., Dogan, M., Celep, F., **Akaydın, G**. and M. Koyuncu, "Morphology, anatomy, palynology and nutlet micromorphology of the rediscovered Turkish endemic *Salvia ballsiana* (Lamiaceae) and their taxonomic implications" *Nordic Journal of Botany,* **28:** (1), 91-99 (2010).
32. Cabi, E., Doğan, M., Özler, H., **Akaydın, G.** and A. Karagöz, " Taxonomy, morphology and palynology of *Aegilops vavilovii* (Zhuk.) Chennav. (Poaceae: Triticeae)". *African Journal of Agricultural Research*, **5:** (20) 2841-2849 (2010).
33. Özüdoğru, B., Erik, S. ve **G. Akaydın**, "The Flora of the Karababa Mountain (Sivas-Şarkışla/Turkey)" *Biological Diversity and Conservation*, **3:** (3) 176-192 (2010).
34. Karaer, F., Karaer, F. and **G. Akaydın "**EXAMINING THE ATTITUDES OF SECONDARY SCHOOL STUDENTS TOWARDS BIOLOGY COURSES WITH REGARD TO CERTAIN VARIABLES**"** *Journal of Qafqaz University (Philology and Padagogy)*, 31: 70-78 (2011).
35. Doğan, H.M., Doğan, M., **Akaydın, G.** and F. Celep **"**Mapping and analysing the diversity of the genus *Acantholimon* taxa in Turkey by geographic information systems (GIS)" *Turkish Journal of Botany*, **35:** (2), 91-119 (2011).
36. Çınar, Ö. G., Kırmızıbekmez, H., **Akaydın, G.** and E. Yeşilada "Investigation of *in vitro* Opioid Receptor Binding Activities of Some Turkish *Salvia* Species" *Rec. Nat. Prod.* **5**: 4, 281-289 (2011).
37. **Akaydın, G**., Özüdoğru, B., Kırmızıbekmez, H. and E. Yeşilada " The Flora of Kayışdağı (İstanbul/Turkey) and floristic comparision with neighboring floras" *Biological Diversity and Conservation* 4: (1) 67-78 (2011).
38. Mavi, Ö., Dogan, M., Başer, B., Pehlivan, S., Cabi, E. and **G. Akaydın** "Anatomy and pollen morphology of *Leymus racemosus* (Lam.) Tzvelev subsp. *sabulosus* (Bieb.) Tzvelev and *Leymus cappadocicus* (Boiss. & Bal.) Melderis" *Bangladesh J. Plant Taxon.* **18**: 1. 27-38 (2011).
39. Özüdoğru, B., **Akaydın, G.,** Erik, S. and E. Yeşilada " Inferences from an ethnobotanical field expedition in the selected locations of Sivas and Yozgat provinces (Turkey)" *Journal of Ethnopharmacology*. **137**: 1. 85-98 (2011).
40. Erdoğan Orhan, İ., Şenol, F.S., Öztürk, N., **Akaydın, G**. and B. Şener " Profiling of in vitro neurobiological effects and phenolic acids of selected endemic *Salvia* species" *Food Chemistry*, , **132:** 1360-1367 (2012).
41. Yeşilyurt, E. B. and **G. Akaydın** "Endemic Plants and Their Threat Categories of Muğla Province (Turkey)" *Hacettepe Journal of Biology and Chemistry*, **40:** (2)**:** 195-212 (2012).
42. Özmen, E., Doğan, C., **Akaydın, G.** and M. Doğan "Pollen morphology of inland species of Turkish *Limonium* Miller (Plumbaginaceae)" *Biological Diversity and Conservation* **5:** (2) 7-18 (2012).
43. Mansion, G., Parolly, G., Crowl, A., Mavrodiev, E., Cellinese, N., Oganesian, M., Fraunhofer, K., Kamari, G., Phitos, D., Haberle, R., **Akaydın, G.,** Ikinci, N., Raus, T. and T. Borsch " How to Handle Speciose Clades? Mass Taxon-Sampling as a Strategy towards Illuminating the Natural History of Campanula (Campanuloideae)" *PLOS One,* **7:** 11, 1-23 (2012).
44. Erdoğan Orhan, İ., Şenol, F.S., Erçetin, T., Kahraman, A., Celep, F., **Akaydın, G.,** Şener, B. and M. Doğan "Assessment of anticholinesterase and antioxidant properties of selected sage (*Salvia*) species with their total phenol and flavonoid contents" *Industrial Crops and Products,* **41:** 21-30 (2013).
45. Salihoğlu,M.E., **Akaydın, G.**, Can, C.E. and S.Y. Akaydın. "Evaluation of Antioxidant Activity of Various Herbal Folk Evaluation Medicine" *FABAD J. Pharm. Sci.* **35:** 59-67 (2010).
46. **Akaydın, G.**, Şimşek, I., Arıtuluk, Z.C. and E. Yeşilada "An ethnobotanical survey in selected towns of the Mediterranean subregion (Turkey)" *Turkish Journal of Biology,* **37:** 230-247 (2013).

47. Salihoğlu,M.E., **Akaydın, G.**, Can, C.E. and S.Y. Akaydın. "Evaluation of Antioxidant Activity of Various Herbal Folk Medicines" *J. Nutr. Food Sci.,* **3/5:** 1-9 (2013).
48. Çankaya, I.T., Alqasoume, S.I., Abdel-Rahman, R.F., Yusufoğlu, F., Arabacı, S., **Akaydın, G.** and G.A. Soliman. "Evaluating the Antifertility Potential of the Ethanolic Extracts of *Bupleurum sulphureum* and *Cichorium intybus* in Male Rats" *Asian Journal of Pharmaceutical and Clinical Research,* **7/1:** 211-218 (2014).
49. Kırmızıbekmez, H., Bardakcı, H., Masullo, M., Kamburoğlu, Ö., Eryılmaz, G., **Akaydın, G.**, Yeşilada, E. and S. Piacante " Flavonol Glycosides and Iridoids from *Asperula lilaciflora*" *Helvetica Chimica Acta,* **97:** 1571-1576 (2014).
50. Bardakçı Altan, H., Akaydın, G., Kırmızıbekmez, H. and E. Yeşilada "Validated HPTLC Method for the Quantitative Analysis of Rosmarinic Acid in Several Salvia sp." *Turk J Pharm Sci,* **11 (3);** 245-254 (2014).
51. Arıtuluk, Z.C., Ezer, N. and **G. Akaydın** " Flora of Tefenni district (Burdur/Turkey)" *Biological Diversity and Conservation* **7:(3),** 146-166 (2014).
52. Yeşilyurt, E. B., Erik, S., Özmen, E. and **G. Akaydın. "**Comparative Morphological, Palynological and Anatomical Characteristics of Turkish Rare Endemics *Helianthemum germanicopolitanum* and *Helianthemum antitauricum* (Cistaceae" *Plant Systematics and Evolution*, **301:** 125-137 (2015).
53. Türkmenoğlu, F.P., Agar, O.T., **Akaydın, G.**, Hayran, M. and B. Demirci. "Characterization of the Volatile Compounds of Eleven *Achillea* Species Essential Oils from Turkey and Biological Activities of the Essential Oil and Methanol Extract of A. hamzaogluii" *Molecules,* **20:** 11432-11458 (2015).
54. Yusufoğlu, H., Soliman, G.A., Abdel-Rahman, R.F., Tatlı-Çankaya, İ., Alqasoumi, S.I., Arabacı, S. and **G. Akaydın** "The potential hepatoprotective activity of *Allium paniculatum* and *Capparis spinosa* on thioacetamide induced hepatotoxicity in rats" Asian J. Biol. Life Sci., **4:1,** 46-52 (2015).
55. Özüdoğru, B., **Akaydın, G.,** Erik, S., Al-Shehbaz, Ihsan A. and K. Mummenhoff "Phylogeny, diversification and biogeographic implications of the eastern Mediterranean endemic genus *Ricotia* (Brassicaceae)" *Taxon,* **64** (4): 727-740 (August 2015)
56. Yeşilyurt, E. B., Erik, S., Özmen, E. and **G. Akaydın.** " Taxonomic studies on endemic species from Turkey: *Helianthemum nummularium* (L.) Miller subsp. *lycaonicum* Coode&Cullen (Cistaceae)" *Biological Diversity and Conservation* 8**:(3),** 181-187 (2015).
57. Yusufoğlu, H., Soliman, G.A., Abdel-Rahman, R.F., Alqasoumi, S.I., Arabacı, S., **Akaydın, G.** and I. Irem Tatlı, " Evaluating the antifertility potential of the ethanol extracts of Heliotropium europaeum and Taraxacum serotinum in male rats" *FABAD J. Pharm. Sci.* **38** (1): 11-23 (2013).
58. Abdel-Rahman, H., Soliman G.A., Yusufoğlu, H.S., Tatlı-Çankaya, İ., Alqasoumi, S.I., Arabacı, S. and **G. Akaydın** "Potential Anticonvulsant Activity of Ethanol Extracts of *Cichorium intybus* and *Taraxacum serotinum* in Rats" *Tropical Journal of Pharmaceutical Research,* **14** (10): 1829-1835. Doi: 10.4314/tjpr.v14i10.13
59. Atay, İ., Kırmızıbekmez, H., Kaiser, M., Akaydın, G., Yeşilada, E. and D. Taşdemir "Evaluation of in vitro antiprotozoal activity of Ajuga laxmannii and its secondary metabolites" *Pharmaceutical Biology,* DOI: 10.3109/13880209.2015.1129542 (2016)
60. Özüdoğru, B., **Akaydın, G.,** Erik, S. and K. Mummenhoff "Seed morphology of *Ricotia* (Brassicaceae) and its phylogenetic and systematic implication" ***Flora***, 222: 60-67 (2016). Doi: 10.1016/j.flora.2016.03.013
61. Balkan, İ.A, Taşkın, T., Tuğba Doğan, H., Deniz, İ., **Akaydın, G**. and E. Yeşilada "A comparative investigation on the in vitro Anti-inflammatory, Antioxidant and Antimicrobial potentials of subextracts from the aerial parts of *Daphne oleoides* Schreb. subsp. o*leoides" Industrial Crops and Products,* 95: 695-703 (2017). Doi:10.1016/j.indcrop.2016.11.038
62. Yeşilyurt, E.B., Şimşek, I., Tuncel, T., **Akaydın, G.** ve E. Yeşilada "Marmara Bölgesi' nin Bazı Yerleşim Merkezlerinde Halk İlacı Olarak Kullanılan Bitkiler" *Marmara Pharmaceutical Journal*, 21: 132-148 (2017).
63. Yeşilyurt, E.B., Şimşek, I., **Akaydın, G.** and E. Yeşilada "An ethnobotanical survey in selected districts of the Black Sea region (Turkey)" *Turkish Journal of Botany*, **41:** 47-62 (2017). Doi: 10.3906/bot-1606-12
64. Karcı, E., Gürbüz, İ., **Akaydın, G.** and T. Günbatan "Folk medicines of Bafra (Samsun-Turkey) Bafra'nın (Samsun-Türkiye) halk ilaçları" *Turk J Biochem,* 42(4): 381-399 (2017).
65. Yapıcıoğlu, A.E., Atmaca, S., Akbulut, A., Ceyhan, G.D., Durmuş, Y., **Akaydın, A.** and A. Demirsoy, "Journey to natural history museum in perspective of children" *European Journal of Science and Mathmatics Education,* 5 (4): 365-375 (2017).
66. Doğan, M. and **G. Akaydın,** "Two New Species of *Limonium* Mill. (Plumbaginaceae) from Soutwest Anatolia, Turkey" Ot Sistematik Botanik Dergisi, 24 (2) 13-28 (2017).

67. **Akaydın, G.** and Manuel B. Crespo "*Acantholimon davisii* (Plumbaginaceae), a new specific name for the Turkish endemic *A. caryophyllaceum* subsp. *parviflorum*" *Phytotaxa,* 334(1):080-082 (2018).
68. **Akaydın, G.**, "*Acantholimon ibrahimii* (Plumbaginaceae), a new species of *A.* section *Staticopsis* from the Mediterranean part of Turkey" *Phytotaxa,* 340(1):048-054 (2018).
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S. LEVENT TURAN

HACETTEPE UNIVERSITY FACULTY OF EDUCATION 06800, BEYTEPE, ANKARA-TURKEY
PHONE (312) 2978604 • E-MAIL LETUR@HACETTEPE.EDU.TR

OBJECTIVE

[Type Objective Here]

EDUCATION

1979 - 1984 Hacettepe University, Ankara, Turkey
Bachelor of Science
- *Biology*

1986 -1988 Hacettepe University, Ankara, Turkey
Master of Science
- *Zoology*

1988-1992 Hacettepe University, Ankara, Turkey
Ph.D.
- *Zoology*

WORK EXPERIENCE

1985 - 1992 Hacettepe University, Ankara, Turkey
- *Research Assistant*

1992 - 1998 Hacettepe University, Ankara, Turkey
- *Assistant Professor*

1998 - 2006 Hacettepe University, Ankara, Turkey
- *Associated Professor*

2006 - 2014 Hacettepe University, Ankara, Turkey
- *Professor*
- Head of Department

SKILLS

[Click here and enter information.]

REFERENCES

References and letters of recommendation available on request.

Doğum Tarihi : 20.01.1961
Doğum Yeri : Tosya
Tabiyeti : T.C
Medeni Durumu : Evli
Halen Çalıştığı Kurum : Hacettepe Üniversitesi, Eğitim Fakültesi
Biyoloji Eğitimi Anabilim Dalı

Öğrenim Durumu

-1984 Hacettepe Üniversitesi Fen Fakültesi Biyoloji Bölümü (Lisans)
-1988 Hacettepe Üniversitesi Biyoloji Bölümü (Yüksek Lisans)
-1992 Hacettepe Üniversitesi Fen Bilimleri Enstitüsü (Doktora)

Akademik Ünvan : Prof. Dr.

Yabancı Dil : İyi derecede Almanca ve İngilizce

Burslar

-1985 Goethe Institut Dil Bursu, Almanya
-1987 DAAD Bilimsel Araştırma Bursu, Almanya
-1993 Goethe Institut Dil Bursu, Almanya
-1997 DAAD Bilimsel Araştırma Bursu, Almanya

EĞİTİM VE ÖĞRETİM FAALİYETLERİ

- Genel Zooloji, Çevre Koruma, Embriyoloji, Histoloji, Sitoloji, Omurgalılar Biyolojisi, Ornitoloji, Modern Biyoloji, Biyoloji Didaktiği, Populasyon Biyolojisine Giriş, Omurgalıların Karşılaştırmalı Anatomisi, Teknik Preparasyon, Dersleri ile Genel Biyoloji Pratiklerinde Lisans ve Biyoloji Eğitimi alanında Lisansüstü düzeyinde Öğretim Üyeliği ve danışmalığı.

- "Demographical, Physiological, Genetical and Behavioral Aspects of Population Biology of Passerine Birds" NATO-International Workshop, 3-8 Ekim 1989, Corsica-Fransa.

- Doğa ve Erozyon Eğitimi Kampında "Doğal Denge, Ekosistem ve Biyolojik Çeşitlilik" konulu, uygulamalı Eğitim Çalışmaları. Bolu, Temmuz, 1999 Düzenleyen: TEMA Vakfı.

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- 08 Haziran 2000. Namık Kemal İlköğretim Okulu. Dünyamızı Paylaştığımız Kuşlar. Konuşma, Dia Gösterisi.
- 09-10 Nisan 2001. Orman Bakanlığı MPAYHGM, MEB. I. Avcı Eğitimi Programı, Sincan HEM. İlk ders. Konu Yaban Hayatı Ekolojisi, Sürdürülebilir Yaban Hayatı.

- 30 Nisan-02 Mayıs 2001. Orman Bakanlığı MPAYHGM, MEB. II. Avcı Eğitimi Programı, Sincan HEM. Konu: Ekolojik Konular, Yaban Hayatı Ekolojisi, Sürdürülebilir Yaban Hayatı.

- 09-10 Temmuz 2001. Orman Bakanlığı MPAYHGM, MEB. Avcı Eğitimi Programı, Cebeci/ Ankara HEM. Konu: Ekolojik Konular, Yaban Hayatı Ekolojisi, Sürdürülebilir Yaban Hayatı.

- 14-15 Nisan 2001. UNDP, TTKD. Kastamonu Küre Dağları M.P Çevresinde Yerel Yöneticilerin ve İlköğretim Öğretmenlerinin Çevre Bilincinin Artırılması Projesi. Fauna Kısmı Sorumlusu. Seri Seminerler ve Yerinde Eğitim.

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Türkiye Avifaunası. Nevşehir.

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- Mayıs 2007. Sincan İlköğretim Okulu. Biyolojik Çeşitlilik ve Küresel Isınma.
- Kuşlar ve Küresel Isınma. Mayıs, 2007-Yakındoğu Üniversitesi. KKTC.
- Kuşlar ve Küresel Isınma. Mayıs, 2007-Doğu Akdeniz Üniversitesi. KKTC
- Tübitak-Kemaliye Doğa Okulu.Omurgalı Hayvanlar. Temmuz 2007 Kemaliye-Erzincan.(Türkiye'nin Omurgalı Hayvanları ve Yaban Hayatı)
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- Tübitak-Kemaliye Doğa Okulu.Omurgalı Hayvanlar. Temmuz 2009 Kemaliye-Erzincan. (Türkiye'nin Omurgalı Hayvanları ve Yaban Hayatı)
- Tübitak-Kemaliye Doğa Okulu.Omurgalı Hayvanlar. Temmuz 2010 Kemaliye-Erzincan. (Türkiye'nin Omurgalı Hayvanları ve Yaban Hayatı)
- Tübitak-Kemaliye Doğa Okulu.Omurgalı Hayvanlar. Temmuz 2011, Kemaliye-Erzincan. (Türkiye'nin Omurgalı Hayvanları ve Yaban Hayatı).
- Tübitak-Kemaliye Doğa Okulu.Omurgalı Hayvanlar. Temmuz 2014, Kemaliye-Erzincan. (Türkiye'nin Omurgalı Hayvanları ve Yaban Hayatı)

MESLEKİ ÇALIŞMA VE DENEYİMİ

1984 yılından itibaren Biyoloji Eğitimi Anabilim Dalı'nda Genel Biyoloji, Zooloji ve Biyoloji Eğitimi, Çevre Eğitimi alanlarında Lisans ve Lisansüstü düzeyde çeşitli dersler ve uygulamalarda Öğretim Yardımcılığı ve Üyeliği; Yürütülen ulusal ve uluslar arası araştırma ve uygulama projelerinde yürütücülük ve yardımcı araştırıcılık.

UZMANLIK ALANLARI

Mezuniyet tarihinden itibaren Zooloji-Ekoloji, Ornitoloji ve Çevre Eğitimi, Yaban Hayatı Ekolojisi ile ilgili yurt içinde ve dışında çeşitli çalışmalar ve araştırmalarda bulunmuş ve kurslara dinleyici ya da eğitmen pozisyonunda katılmıştır.

ÜYE OLDUĞU KURULUŞLAR

1. Biyologlar Derneği
2. Türkiye Tabiatını Koruma Derneği Üyesi
3. Türkiye Tabiatını Koruma Derneği Bilim Kurulu Üyesi
4. Tabiat ve İnsan Dergisi Yayın Kurulu Üyesi
5. Deutsche Ornithologen Gesellschaft (Alman Ornitologlar Derneği)
6. Ekolojik Araştırmalar Derneği

İDARİ GÖREVLER

1) Hacettepe Üniversitesi Çevre Eğitimi, Kuş Araştırmaları ve Halkalama Merkezi Müdürü-Devam ediyor.
2) Hacettepe Üniversitesi Toprak Etiği Uygulama ve Araştırma Merkezi Yönetim Kurulu Üyesi: 2015-2019.
3) Hacettepe Üniversitesi Biyolojik Çeşitlilik Uygulama ve Araştırma Merkezi Yönetim Kurulu Üyesi: 2011-2015.
4) Hacettepe Üniversitesi Beytepe-Yurtları Yürütme Komitesi Başkanı (Tamamlandı)
5) Hacettepe Üniversitesi Yurtları Yönetim Kurulu Üyesi (Tamamlandı)

6) Hacettepe Üniversitesi yabancı Diller Yüksek Okulu Yönetim Kurulu Üyesi 2008-2011.
7) Hacettepe Üniversitesi Kuş Gözlem Kulübü Akademik Danışmanı
8) Biyoloji Eğitimi Anabilim Dalı Başkanlığı: 2011-devam ediyor;
9) H.Ü Eğitim Fakültesi Fakülte Kurulu Üyeliği: 2012-2019.
10) H.Ü Eğitim Fakültesi Fakülte Yönetim Kurulu Üyeliği 2013-2019.
11) OFMA Eğitimi Bölüm Başkanlığı 2013-2016.
12) Hacettepe Üniversitesi Döner Sermaye İşletmesi Pestisit Araştırma ve Test Referans Laboratuvarı Sorumlusu (Haziran, 2015-Devam ediyor).

KOMİSYON GÖREVLERİ

1) BAB Komisyonu 2012-2016 Ocak
2) ÖYP Komisyonu 2012-2016
3) BAB Bilimsel Araştırma Projeleri İnceleme ve Değerlendirme Komisyonu Üyesi: Aralık 2013-2016 Ocak.

ÖDÜLLER

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- Biyoloji Alanında Onur Ödülü, Hacettepe Üniversitesi, 2019

GÖRSEL VE SÖZEL MEDYA FAALİYETLERİ

1) Radyo TRT- 1'de iki kez "Gecenin İçinden" Programı, konuk konuşmacı olarak katılım. Konu: Kayseri/Sultansazlığı. Ornitoloji ve Ekoloji.
2) Televizyon TRT-1, GAP-TV: 5 Kasım 1999. Bu toprağın Sesi Programında program konuğu olarak katılım. Konu: Türkiye'nin Ornitolojik Potansiyeli ve Ornito-turizm.
3) Radyo TRT-1: 1 Haziran 2000. Günü Yaşarken Programı. Çevre Kirliliği ve Dünya Çevre Günü Hk. (Canlı Yayın Konuğu)
4) Radyo TRT 1: 18 Ocak 2001. Günü Yaşarken Programı (Canlı Yayın). Konu: Başkentin Kuşları.
5) Televizyon TRT-1, GAP-TV: 12 Mart 2001. Bu Toprağın Sesi Programı, Program Konuğu, Konu: Tarımda Kimyasal Mücadele.
6) Radyo TRT-1. Günün İçinden. Haziran 2003. Yeni Kara Avcılığı Kanunu hk.
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8) Radyo TRT-1. Ankara'nın Çevre Sorunları. 5 Nisan 2010.

KATILDIĞI PROJELER

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10. Uluslararası Önemi Olan Sulakalanların (Sultansazlığı, Tuzla Gölü, Seyfe Gölü, Seyhan-Ceyhan Deltaları) Biyolojik ve Ekolojik Yönden Araştırılması. T.C. Çevre Bakanlığı (1998-2000 Tamamlandı.) Avifauna Kısmı **Yürütücüsü**.

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12. Beyşehir Gölü Milli Parkı. Flora ve Fauna Elemanlarının Belirlenmesi. Omurgalı Kısmı **Koordinatör Araştırıcı** (Tamamlandı. 2001).

13. Antalya Beydağları Olimpos Sahil Milli Parkı Uzun Vadeli Yönetim Planı. T.C Orman Bakanlığı, Milli Parklar ve Av Yaban Hayatı Genel Müdürlüğü. Omurgalı Hayvanlar Kısmı **Koordinatör Araştırıcı** (Tamamlandı. 2001).

14. Göreme Tarihi Milli Parkı Yönetim Planı. T.C Orman Bakanlığı, Milli Parklar ve Av Yaban Hayatı Genel Müdürlüğü. Omurgalı Hayvanlar Kısmı. (**Koordinatör Araştırıcı** Tamamlandı, Nisan-Aralık 2001).

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16. Ayvalık Adaları Milli Parkı Yönetim Planı. T.C Orman Bakanlığı, Milli Parklar ve Av Yaban Hayatı Genel Müdürlüğü. Omurgalı fauna Kısmı **Koordinatör Araştırıcı**. (Tamamlandı, Nisan-Aralık 2001).

17. Ankara Nallıhan, Emrem Sultan Yaban Hayatı Koruma Sahası Av Hayvanları Envanteri. T.C Orman Bakanlığı, Milli Parklar ve Av Yaban Hayatı Genel Müdürlüğü, Ankara Milli Park Başmühendisliği. (Tamamlandı. Aralık 2001). **Proje Yürütücüsü**.

18. Balıkdamı-Eskişehir Avifaunası Üzerine Araştırmalar. Hacettepe Üniversitesi Araştırma Fonu. (Tamamlandı. 2002-2004), **Proje Yürütücüsü**.

19. GEF-II. Biyolojik Çeşitlilik Projesi, Camili-Artvin. **Ornitoloji kısmı yöneticisi.** Çevre ve Orman Bakanlığı, Dünya Bankası. (2002-Tamamlandı).

20. GEF-II. Biyolojik Çeşitlilik Projesi Sultan Sazlığı-Kayseri **Ornitoloji kısmı yöneticisi.** Çevre ve Orman Bakanlığı, Dünya Bankası. (2002-Tamamlandı).

21. GEF-II. Biyolojik Çeşitlilik Projesi Sultan Sazlığı-Kayseri **Fauna Direktörü.** Çevre ve Orman Bakanlığı, Dünya Bankası. (2002-Tamamlandı).

22. Karagöl-Sahara (Artvin) Milli Parkı Uzun Devreli Gelişim Planı. Doğa Koruma ve Milli Parklar Genel Müdürlüğü. Fauna Kısmı, Koordinatör **Araştırıcı** (2004-2006 Tamamlandı).

23. Başkomutanlık Milli Parkı (Afyonkarahisar) Uzun Devreli Yönetim Planı. Doğa Koruma ve Milli Parklar Genel Müdürlüğü **Koordinatör Araştırıcı** (2004-2006.Tamamlandı)

24. Akdağ Tabiat Parkı (Afyonkarahisar) Uzun Devreli Yönetim Planı. Doğa Koruma ve Milli Parklar Genel Müdürlüğü **Koordinatör Araştırıcı** (2004-2006 Tamamlandı)

25. Yeşilırmak Havzası Uzun Devreli Yönetim Planı. DPT. Dolsar. **Koordinatör Araştırıcı** 2004- (Tamamlandı).

26. Nabucco-Türkiye Doğalgaz İletim hattı Ön Etüd Raporu, Fauna-Flora Çalışmaları. **Koordinatör Araştırıcı, Fauna Sorumlusu.** 2004. (Tamamlandı).

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28. Kızıldağ Milli Parkı 1/25.000 Ölçekli Gelişim Planı. Doğa Koruma ve Milli Parklar Genel Müdürlüğü **Fauna Sorumlusu** (2005-).

29. Kovada Gölü Milli Parkı 1/25.000 Ölçekli Gelişim Planı. Doğa Koruma ve Milli Parklar Genel Müdürlüğü **Fauna Sorumlusu** (2005-).

30. Yazılıkanyon Tabiat Parkı 1/25.000 Ölçekli Gelişim Planı. Doğa Koruma ve Milli Parklar Genel Müdürlüğü **Fauna Sorumlusu** (2005-).

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32. Osmaniye İli 1/100.000 Ölçekli Çevre Düzeni Planı Hazırlanması Projesi. Fauna Direktörü. H.Ü. Döner Sermaye İşletmesi- İşlem Mühendislik. (2005-Tamamlandı).

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50. **A**rıkan, K. **Turan, L**. 2015: Türkiye'de Tehlikedeki Kuş Türleri ve Tehditler. Ulusal Zooloji Kongresi, Nevşehir. 28-31 Ağustos, 2015.

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54. Çakırlar, E., **Turan, L.** 2015**:** The Opinions of High School Students Regarding Energy and its Problems. International Trends and Issues in Communication and Media Conference. 02-04 Sept. 2015, St.Petersburg, Russia.

55. Çakırlar, E., **Turan, L.** 2016**:** Approaches of Biology Teacher Candidates Towards Ecological Products. IX. European Conference on Social and Behavioral Science. 03-06.02.2016. Paris, France.

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60. Arıkan, K. **Turan, L**: 2016 Yarasa ve Kuşlarda Entegre Kontrol Çalışmaları. II. Ulusal Vektör Mücadele Kongresi. Kasım, 2016, Antalya.

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Posterler

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2. Adızel, Ö., Durmuş, A., **Turan, L. ,** Kiziroğlu, İ. 2002: Ahlat Sazlığı'nın (Bitlis) Korunması ve Gelişmesi Üzerine Bir Çalışma. **XVI. Biyoloji Kongresi.** 4-7 Eylül 2002, Malatya.

3. Kiziroğlu, I, **Turan**, L., A. Erdoğan Ö. Adızel, M. H.Kiziroğlu. 2003: The extent of environmental related discussions in the Turkish printed Media. **12. International Symposium on Environmental Pollution and its Impact on Life in the Mediterranean Region.** October 4-8 Antalya, Turkey. Fresenius Environmental Bulletin, Vol.13-No11a-2004, pp.1109-1111.

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5. **Turan, L**. 2006: Rüzgar Türbinleri ve Türkiye. XVIII. Ulusal Biyoloji Kongresi, 26-30 Haziran. Aydın.

6. Kiziroğlu, İ., **Turan, L**. 2006: The diversity of woodpeckers in Turkey and their role in biological control. 24th International Ornithological Congress, Hamburg, Germany, 13-19 August 2006. Journal of Ornithology 147, Suppl. S. 195 (2006).

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9. **Turan, L.** 2008: Yerel Biyolojik Kaynak değerlerinin Biyoloji Eğitiminde Kullanılması. 19. Biyoloji Kongresi, Haziran 2008. Trabzon.

10. **A**rıkan, K., **L.Turan**, 2014: Kız kuşu'nun (*Vanellus vanellus*) Türkiye'deki Dağılımı ve Habitat Seçimi. 22.Ulusal Biyoloji Kongresi, Haziran 2014, Eskişehir.

11. Şahin Arslan,N. **L.Turan**, Z.Ayaş, 2014: Kızıl Sırtlı Örümcek Kuşlarında (*Lanius collurio*) Yumurtadan

Çıkma Başarısı ve Cüce Yumurtalar. Hatching Success of the Red backed-Shrikes and "Tinny Eggs". 22.Ulusal Biyoloji Kongresi; Haziran 2014, Eskişehir.

12. Arıkan, K., Turan, L. 2016: Yarasa ve Kuşlarda Entegre Kontrol Çalışmaları. III. Vektör Mücadelesi Sempozyumu. 10-13 kasım, 2016, Antalya. S.21.

13. Arıkan, K., Arıkan, Z.Y., Turan, L. 2016: Ev Sineklerinin *Musca domestica* L. Karbamatlı İnsektisilere Karşı Direnç Düzeylerinin Asetilkolinesteraz Enzim Aktivitesi İle Karşılaştırmalı Olarak Araştırılması Üzerine Bir çalışma. III.Vektör Mücadelesi Sempozyumu. 10-13 kasım, 2016, Antalya. S.47.

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KİTAPLAR

1) **Turan, L**., Göktaş, A. 2000: Başkentin Kuşları-Birds of Ankara. Ankara Valiliği Çevre Koruma Vakfı Yayını. A.Ü Basımevi-Ankara. 109 s.

2) **Turan, L**. 2002: Teknik Preparasyon. 195 s.

3) **Turan, L**., Ketenoğlu, O., Aydoğdu, M., Kaynak, S. 2001: Biyolojik Çeşitlilik ve Çevre Koruma Rehberi. UNDP, TTKD. 139 s.

4) Kiziroğlu, İ., İnanç, N., **Turan, L**. 2001: Çevre Eğitimi. V.Uluslararası Ekoloji ve Çevre Sorunları Sempozyumu. T.C Çevre Bakanlığı. Ankara 242 s.

5) **Turan, L.** 2007: Biyolojik Çeşitlilik ve Türkiye. Tübitak-H.Ü. Ankara, 196 s.

6) Kiziroglu, I., **Turan, L**. Adızel,Ö., Sertoğlu, M., Erdoğan, A. ve Sert, H. 2010: Ekolojik Avcılık (Fotosafari) Eğitimi. T.C Çevre ve Orman Bakanlığı, 265 S. Ankara.

Tezler:

MSc: 1988 Ankara/ Beytepe Saksağan, ***Pica pica pica*** L. (**Corvidae**; Aves) Populasyonu İle ilgili Biyo-Ekolojik Araştırmalar. H.Ü Fen Bilimleri Enstitüsü

PhD: 1992 Türkiye'de Kuluçkaya Yatan Bıldırcın (***Coturnix coturnix coturnix*** L, 1758) Populasyonları İle ilgili Biyo-Etolojik Araştırmalar.H.Ü Fen Bilimleri Enstitüsü.

CURRICULUM VITAE

Proposed role in the project: HERPETOLOGIST (Amphibian and Reptile – Marine Turtle Specialist)
Category: Senior Expert

15. **Family name:** **Candan**
16. **First names:** **Onur**
17. **Date of birth:** **11.12.1980**
18. **Passport holder:** **Turkish**
19. **Residence:** **Ordu**
20. **Education:**

Institution [Date from - Date to]	Degree(s) or Diploma(s) obtained
1998-2004	BSc – Bilogy (Hacettepe University – Ankara/TURKEY)
2004-2006	MSc – Zoology (Hacettepe University – Ankara/TURKEY)
2006-2010	PhD – Zoology (Hacettepe University – Ankara/TURKEY)
2018- up to date	Associate Professor – Ecology (Head of Interuniversity Committee)

21. **Language skills:** Indicate competence on a scale of 1 to 5 (1 - excellent; 5 - basic)

Language	Reading	Speaking	Writing
Turkish	1	1	1
English	1	2	1

22. **Membership of professional bodies:** ISTS – International Sea Turtle Society, National Scientific Committee of Sea Turtles, EKAD – Ecological Research Society
23. **Other skills:** Computer Literacy, Professional Driving (Defensive-AntiSkid-Offroad), Animal Handling
24. **Present position:** Associate Professor (Faculty Member)
25. **Years within the firm:** 14
26. **Key qualifications:** Dr.Candan is highly qualified in the field of biological and ecological researches. He has been participated in various projects as director, expert, researcher, research assistant and project assistant since 2000. He is specialized in biological and ecological research especially on marine turtles, amphibians and reptiles. Besides, he has many experiences on biodiversity. He has been participated in numerous projects for two decades in different parts of Turkiye on behalf of governmental and non-governmental organizations.

    His master and doctorate thesis are both on marine turles' hatchling sex ratio in Yumurtalık – Adana and Kazanlı – Mersin. He also has practice on wildlife satellite telemetry, rehabilitation and many more. He has scientific papers and conference attendance in national and international organisations.

    At present, he is working as Associate Professor in Ordu University Molecular Biology and Genetics Dept. General Biology section. He is also head of this section.

    For the publications please follow the links below;
    https://orcid.org/0000-0002-9254-4122

    http://akademi.odu.edu.tr/sayfalar/onurcandan-6kz
    .

27. **Specific experience in the region:** Anatolia (TURKEY)

Country	Date from - Date to
Turkey	2000- up to date

28. **Professional experience**

Year	Location	Company& reference reference person (name & contact details)	Name of Assignment or Project / Position Held	Activities Performed
2021– …	Turkey	Ministry of Environment and Urbanization, General Directorate of Nature Conservation	Biodiversity of Salda Lake Protected Area / Expert – Herpetology / To determine the species richness and their distribution	A rapid survey to determine the biodiversity of The Salda Lake. The aim of the study is to find the species richness and to conduct core and buffer zones.
2021– …	Turkey	Ministry of Environment and Urbanization, General Directorate of Nature Conservation	Monitoring and Conservation of critical herpetofaunistic species of Specially Protected Area / Six species on five protected area/ Expert – Herpetology / To determine the species homerange and conservation strategies	A detailed survey to determine the homerange and conservation demands of six critical species on five specially protected areas. The population densities, gender ratio, thermal biology, home-ranges will be determined by sophisticated research techniques.
2019-…	Turkey	EMBA Hunutlu CPP	Marine Turtle Specialist	Beach monitoring for nesting and nonnesting emergencies, Researches on reproductive ecology of marine turtles within the study site
2008-2021	Turkey	BOTAŞ International Limited Co.	Marine Turtle Survey on Sugözü Beaches-Ceyhan/ADANA / Marine Turtle Specialist /	Beach monitoring for nesting and nonnesting emergencies, Researches on reproductive ecology of marine turtles within the study site

2019	Turkey	Ministry of Environment and Urbanization, General Directorate of Nature Conservation	Monitoring And Conservation Of Sea Turtles *(Caretta Caretta, Chelonia Mydas)* And Soft-Shelled Nile Turtle *(Trionyx Triunguis)* Populations Within The Scope Of Göksu Specially Protected Area Monitoring Species And Habitat Project/ Marine Turtle Specialist /	Beach monitoring for nest and nonnesting emergencies, Researches on reproductive ecology of marine turtles within the study site
2018 - 2019	Turkey	Global Environment Facility (GEF), Food and Agriculture Organization of the United Nations (FAO) FAO -UN / GEF (REP/SEC/2018/01)	Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project Surveys and assessments on biodiversity, socio-economic and socio-cultural aspects, ongoing grazing activities and livestock situation Herpetologist – Senior Expert	A rapid survey to determine the biodiversity of the three pilot areas (Karacadag, Tek Tek Mountains, Kızılkuyu). The aim of the project is to find hot spots and ecological corridors within the study sites.
2018 – 2019	Turkey	Ministry of Environment and Urbanization, General Directorate of Nature Conservation	Biodiversity of Tuz Gölü (the Salt Lake) Protected Area / Expert – Herpetology / To determine the species richness and their distribution	A rapid survey to determine the biodiversity of the Tuz Gölü (The Salt Lake). The aim of the study is to find the species richness and to conduct core and buffer zones.
2018	Turkey	Ministry of Environment and Urbanization, General Directorate of Nature Conservation	Monitoring And Conservation Of Sea Turtles *(Caretta Caretta, Chelonia Mydas)* And Soft-Shelled Nile Turtle *(Trionyx Triunguis)* Populations Within The Scope Of Göksu Specially Protected Area Monitoring Species And Habitat Project/ Marine Turtle Specialist /	Beach monitoring for nest and nonnesting emergencies, Researches on reproductive ecology of marine turtles within the study site

2017-2019	Turkey	Ministry of Environment and Urbanization, General Directorate of Nature Conservation	Biodiversity of Patara Specially Protected Area / Expert – Herpetology / To determine the species richness and their distribution	A survey to determine the biodiversity of Patara Specially Protected Area. The aim of the study is to find the species richness and to conduct core and buffer zones.
2017-2019	Turkey	General Directorate of Nature Conservation and National Parks	Biodiversity of Yozgat Province / Expert – Amphibians /	To determine the species richness and their distribution
2017-2018	Turkey	Ordu University – Scientific Research Projects Department	Evaluating the adult morphology on nest, egg and hatchling morphology of green turtles C*helonia mydas*, L.,1758) / Project Director/	Whole field studies required for sampling and reporting
2015-2018	Turkey	General Directorate of Nature Conservation and National Parks	Management plans of following Natural Parks (Hacı Osman – Sıklık – Alaca – Aymaç – Cemal Tural – Sarıgazel – Şahinkaya Canyon – Göksu)	Fauna Expert or Herpetologist to prepare 8 different national parks management plan of several location in Anatolia (Hacı Osman – Sıklık – Alaca – Aymaç – Cemal Tural – Sarıgazel – Şahinkaya Canyon – Göksu)
2017	Turkey	Ministry of Environment and Urbanization, General Directorate of Nature Conservation	Monitoring And Conservation Of Sea Turtles *(Caretta Caretta, Chelonia Mydas)* And Soft-Shelled Nile Turtle *(Trionyx Triunguis)* Populations Within The Scope Of Göksu Specially Protected Area Monitoring Species And Habitat Project/ Marine Turtle Specialist /	Beach monitoring for nesting and nonnesting emergencies, Researches on reproductive ecology of marine turtles within the study site

2015-2017	Turkey	General Directorate of Nature Conservation and National Parks	Biodiversity of Çankırı Province / Expert – Amphibians /	To determine the species richness and their distribution
2015-2017	Turkey	General Directorate of Nature Conservation and National Parks	Biodiversity of Çorum Province / Expert – Amphibians /	To determine the species richness and their distribution
2016-2017	Turkey	Cumhuriyet University – Scientific Research Projects Department	Histological, Morphological and Molecular Determination of Hatchling Sex in Green Turtles (Chelonia mydas) / Assistant Researcher/	To determine the species sex ratio histologically
2016	Turkey	Ministry of Environment and Urbanization, General Directorate of Nature Conservation	Monitoring And Conservation Of Sea Turtles *(Caretta Caretta, Chelonia Mydas)* And Soft-Shelled Nile Turtle *(Trionyx Triunguis)* Populations Within The Scope Of Göksu Specially Protected Area Monitoring Species And Habitat Project/ Marine Turtle Specialist /	Beach monitoring for nesting and nonnesting emergencies, Researches on reproductive ecology of marine turtles within the study site
2014-2016	Turkey	General Directorate of Nature Conservation and National Parks	Biodiversity of Trabzon Province / Expert – Amphibians /	To determine the species richness and their distribution
2014-2015	Turkey	Ordu University – Scientific Research Projects Department	Determination of metabolic heating of Green Turtle (Chelonia mydas L., 1758) nests in Sugözü Beaches (Ceyhan-Adana)) / Project Director/	Whole field studies required for sampling and reporting

2013-2015	Turkey	Ordu University – Scientific Research Projects Department	Determination of Bacterial Flora in Eggs and Eggs of Chelonia mydas (L., 1758) in Sugözü Beaches (Ceyhan-Adana)/ Project Director/	Whole field studies required for sampling and reporting
2014	Turkey	Ministry of Environment and Urbanization, General Directorate of Nature Conservation	Monitoring And Conservation Of Sea Turtles *(Caretta Caretta, Chelonia Mydas)* And Soft-Shelled Nile Turtle *(Trionyx Triunguis)* Populations Within The Scope Of Göksu Specially Protected Area Monitoring Species And Habitat Project/ Marine Turtle Specialist /	Beach monitoring for nesting and nonnesting emergencies, Researches on reproductive ecology of marine turtles within the study site
2013	Turkey	Turkish Republic Tirebolu District Governorate	Ecosystem Impact Assessment of Hydroelectric Power Plant on Tirebolu Harşit River / Expert – Fauna /	To determine the the adverse effects of facilities and give recommendations to reduce the effects on wildlife
2013	Turkey	Ordu University – Scientific Research Projects Department	Investigation of terrestrial vertebrate fauna over Cumhuriyet Campuss of Ordu University / Assistant Researcher/	To determine the species richness and their distribution
2013	Turkey	Verwater Group B.V.	VERWATER Ceyhan Marine Terminal Jetty ve Marpol Construction Expert – Fauna /	To determine the the adverse effects of facilities and give recommendations to reduce the effects on wildlife
2012	Turkey	General Directorate of Nature Conservation and National Parks	Biodiversity of Hazar Lake-Elazığ / Expert – Herpetology /	To determine the species richness and their distribution
2012	Turkey	Golder Associates (Turkey) Ltd. Co	Environmental Impact Assessment of Fatsa-Altıntepe Golden Mine / Expert – Fauna /	To determine the the adverse effects of facilities and give recommendations to reduce the effects on wildlife

2011-2013	Turkey	Ministry of Environment and Urbanization, General Directorate of Nature Conservation	Habitat and Species Monitoring and Protection of Göksu Delta Specially Protected Area / Marine Turtle Specialist /	Beach monitoring for nesting and nonnesting emergencies, Researches on reproductive ecology of marine turtles within the study site
2012	Turkey	AKS Planning and Engineering Co.	Environmental Impact Assessment of Tonya (Trabzon) Cement Factory / Expert – Fauna /	To determine the the adverse effects of facilities and give recommendations to reduce the effects on wildlife
2010	Turkey	Çınar Engineering & Environmental Consultancy Co.	Ecosystem Impact Assessment of Hydroelectric Power Plants on Çaltı River Basin (Sivas) / Expert – Fauna /	To determine the the adverse effects of facilities and give recommendations to reduce the effects on wildlife

29. **Other relevant information** (e.g., Publications)

Articles in International Peer Reviewed Journals:

LEMBRECHTS, J. J., VAN DEN HOOGEN, J., AALTO, J., ASHCROFT, M. B., DE FRENNE, P., KEMPPINEN, J., CANDAN, O., ... & HIK, D. S. (2021). Global maps of soil temperature. *Global change biology*.

CANDAN, E. D., İDIL, N., & CANDAN, O. (2021). The microbial community in a green turtle nesting beach in the Mediterranean: application of the Biolog EcoPlate approach for beach pollution. *Environmental Science and Pollution Research*, *28*(36), 49685-49696.

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Özkan Ömür,CANDAN ONUR (2017). Yeşil Deniz Kaplumbağalarında (Chelonia mydas) Morfometrik İlişkiler: Ergin, Yumurta, Yavru. 5. Ulusal Deniz Kaplumbağaları Sempozyumu, 20-20.

Arslan Güven,Özkan Ömür,Ergün Güner,Kurtbeyoğlu İsmail Hakkı,Yalavaç İbrahim,CANDAN ONUR (2017). Göksu Deltasındaki Deniz Kaplumbağası Yuvalarında Embriyonik Ölümlerin Değerlendirilmesi. 5. Ulusal Deniz Kaplumbağaları Sempozyumu, 28-28.

CANDAN ONUR,Özkan Ömür,Arslan Güven,CANBOLAT ALİ FUAT (2017). Sugözü Kumsalları Deniz Kaplumbağası İzleme Çalışması 2016-2017 Yılları Araştırma Sonuçları. 5. Ulusal Deniz Kaplumbağaları Sempozyumu, 11-11.

CANDAN ONUR,Arslan Güven,Özkan Ömür,Ergün Güner,Kurtbeyoğlu İsmail Hakkı,Yalavaç İbrahim (2017). Göksu Deltası Deniz Kaplumbağası İzleme Çalışması 2016-2017 Yılları Araştırma Sonuçları. 5. Ulusal Deniz Kaplumbağaları Sempozyumu, 10-10.

CANDAN ONUR,ÖZGÜR MUSTAFA ERKAN,AKBULUT AYDIN,DURMUŞ YUSUF,DEMİRSOY ALİ (2013). Müze Materyali Hazırlama Örneği Fil İskeleti Kurulumu. 1. Ulusal Zooloji Kongresi

CANDAN ONUR,KOLANKAYA DÜRDANE (2012). Sugözü Kumsalları 2008-2009 Yuvalama Sezonu Yavru Cinsiyeti Oranlarının Değerlendirilmesi. 4. Ulusal Deniz Kaplumbağaları Sempozyumu

CANBOLAT ALİ FUAT,CANDAN ONUR,CANDAN AHMET YAVUZ,KILIÇ ÇAĞLA,KURTULUŞ NECMİ,ALTUNTAŞ İRFAN,AKYURT EZGİ TUĞÇE (2012). Sugözü Kumsalları 2010 2011 Yuvalama Sezonu Yavru Cinsiyeti Oranlarının Değerlendirilmesi. 4. Ulusal Deniz Kaplumbağaları Sempozyumu

CANDAN ONUR,KOLANKAYA DÜRDANE,CANBOLAT ALİ FUAT,CANDAN AHMET YAVUZ (2009). Adana Sugözü Kumsalları 2008 2009 yılı yuvalama sonuçları ve değerlendirmesi. 3. Ulusal Deniz Kaplumbağaları Sempozyumu

GÖKTEKİN EMRE,CANDAN ONUR,KOLANKAYA DÜRDANE,BARLAS NURHAYAT (2008). Selenyum'un Teratojenik Ve Histopatolojik Etkilerinin Siçanlar Üzerinde Değerlendirilmesi. 19. Ulusal Biyoloji Kongresi

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CANDAN ONUR (2007). İRİBAŞ DENİZ KAPLUMBAĞASI Caretta caretta REHABİLİTASYON DENEMESİ. 2. Ulusal Deniz Kaplumbağaları Sempozyumu

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CANDAN ONUR,KOLANKAYA DÜRDANE (2007). Hollanda Plaji'nda Ceyhan Adana Yuvalayan Yeşil Deniz Kaplumbağasi Chelonia Mydas Yuvalarinda Kuluçka Sicakliği Kuluçka Süresi Ve Yavrulardaki Eşey Oranlari. VII. Ulusal Ekoloji ve Çevre Kongresi

CANDAN ONUR,KOLANKAYA DÜRDANE (2006). Yeşil Deniz Kaplumbağası Chelonia mydas Yavrularındaki Tahmini Eşey Oranının Hava ve Kumsal Sıcaklıklarından Faydalanılarak Belirlenmesi. 18. Ulusal Biyoloji Kongresi

Biological Sciences Department, Eastern Mediterranean University, Famagusta – North Cyprus, Mersin 10 Turkey
TEL +90 392 630 2109 (office)
TEL +90 533 862 4137 (mobile)
EMAIL burak.cicek@emu.edu.tr

Assist. Prof. Dr. Burak Ali Çiçek

PERSONAL

Date of birth	April 29, 1973
Place of birth	Ankara, Turkey
Nationality	TRNC, TR, CY
Military Service	Completed
Languages	Turkish (Native tongue), English (Fluent)

EDUCATION

September 1999 - February 2006
Hacettepe University, Institute of Science, PhD.,
February 1996 - September 1999
Hacettepe University, Institute of Science, MSc.,
September 1991 - June 1996
Hacettepe University, Biology Department, BSc.,

PROFESSIONAL EXPERIENCE

2013 – present
Director, Biosphere Environmental Consultancy - TEKNOPARK
2007 – present
Director, Underwater Research and Imaging Center, Eastern Mediterranean University, TRNC
2005 – present
Senior Instructor, Eastern Mediterranean University, TRNC
1997 - 2005
Research Assistant, Hacettepe University, Faculty of Science, Biology Department, Ankara/Turkey
1999 - 2000
Consulter, Ekoba Environmental Consultancy
1995 - 1996
Researcher, Research Council of Turkey (TÜBİTAK), Elazığ/ Turkey
1995 - 1997
Translator ISO 9000, ISO 14000 Standards Section, Turkish Standards Institute (TSE), Ankara/Turkey

ONGOING PROJECTS

2021
Project Manager, Marine Expert – Conservation of sea meadows and biological diversity in Ayvalık Adaları Nature Park; Supported by United Nations/GEF
2015 – 2021
Marine Expert - Bandırma Natural Gas Combined Cycle Power Plant Marine Ecology Monitoring Project, Project Owner: Enerjisa
2008 – 2021
Project Manager - Research and Monitoring of Sea Turtles Nesting at İskele and Famagusta Bays of Cyprus, Supported by Ministry of Environment and Tourism

COMPLETED RESEARCH/TECHNICAL PROJECTS

2019
Marine Expert – Saros Floating Storage Regasification Unit (FSRU) Pier Marine Ecology Report; Project Owner: BOTAŞ
2018
Marine Expert – Dilek Peninsula - Büyük Menderes Delta National Park Revised Long Term Development Plan; Project owner: Republic of Turkey Ministry of Forestry and Water Affairs
2018
Marine expert - Botaş Mersin/Mediterranean/Karaduvar Mah. Dolfen/Platform and pipeline project marine ecology report; Project Owner: OPET
2018
Marine Expert - TANAP Offshore Pipeline & Fibre Optic Cable Installation Project, Çanakkale (Encon Consultancy Ltd.); Project owner: SAPURAKENCANA PETROLEUM BERHAD
2017
Marine Expert - Yalova Ship Repair and Docking Expansion Project EBRD ESAP (PR1) Studies (Encon Consultancy Ltd.); Project owned by: TERSAN Shipyard Inc.
2017
Project Manager - Integrated Coastal Zone Management Of Famagusta (Famagusta & iskele) Bay – Cyprus, Supported by Deep Dive/European Union
2017
Marine Expert - Kinali – Tekirdag – Canakkale – Savastepe Motorway Project: Malkara – Canakkale Section including 1915 Canakkale Bridge (Encon Consultancy Ltd.); Project owner: COKIYI A.S.
2016
Marine Expert - Monitoring Marine Environment of İstanbul 3rd Airport Construction, Project owned by IGA
2016
Marine Expert - Preparation of Mediterranean Monk Seal (*Monachus monachus*) Species Conservation Action Plan in Muğla Province (Excluding Milas-Bodrum Districts and SEPA); Project Owner: Republic of Turkey Ministry of Forestry and Rural Affairs
2015
Project Manager – Sustainable Fisheries and Artificial Reefs in İskele – North Cyprus, Supported by European Commission.
2015
Marine Ecology Expert - Environmental Monitoring of 870 MWe SAMSUN NATURAL GAS COMBINED CYCLE PLANT - 2, Encon Consultancy Ltd., Project owned by OMW
2015
ERZIN NATURAL GAS COMBINED CYCLE POWER PLANT MONITORING PROJECT, Encon Consultancy Ltd.
2013-2014
Project Manager - Kalecik – AKSA Coastal Zone Oil Spill Monitoring Project. Project Owner: AKSA
2013
Project Coordinator – Datça (Selimiye-Orhaniye) and Gokova Bay Marine Protected Areas (Muğla/Turkey) Monitoring Project, Supported by General Directorate of Specially Protected Areas of Turkey
2010
Project Coordinator – Gokova Bay Marine Protected Areas Management and Monitoring Project, Supported by General Directorate of Specially Protected Areas of Turkey
2010-2014
Expert, Environmental Monitoring of 870 MWe SAMSUN NATURAL GAS COMBINED CYCLE PLANT, Encon Consultancy Ltd., Project owned by OMW, Samsun, Turkey
2008 – 2010
Area Coordinator for Karpaz Peninsula - Technical assistance for management and protection of potential Natura 2000 sites in the northern part of Cyprus, Supported by European Commission.
2009
Expert (Marine Ecology, Marine Biodiversity), “Marine Surveys in Potential Natura 2000 Sites”, Technical assistance for management and protection of potential Natura 2000 sites in the northern part of Cyprus, Supported by European Commission.

2008 - 2009

Nature Specialist, Preparation of a Environmental Impact Assessment and a Preliminary Environmental Review for waste management installations in the northern part of Cyprus, EUROPEAID Framework (REQUEST FOR SERVICES N° 2008/148-843/1), Supported by European Commission.
2009
Marine Ecology Expert, "Marine Survey in the area of Kumkoy", Service for Preparation of Conceptual and Detailed Designs for Priority Projects on Water and Wastewater Management in Northern Part of Cyprus Euroepeaid/125029/D/SER/CY, Supported by European Commission.
2007
Project Coordinator, Coastal Zone Expert - Classification of Habitats at Karpaz Peninsula of TRNC, Supported by TRNC Ministry of Environment and Natural Resources
2007
Project Manager - Research and Monitoring of Sea Turtles Nesting at Karpaz Peninsula of Cyprus, Supported by Ministry of Environment and Tourism
2007 - 2009
Project Coordinator (for Biologists Association), Recycling on Cycles, Project Supporter: UNDP - ACT.
2006 - 2008
Project Coordinator (for Biologists Association), Increasing Environmental Awareness among Civil Society Organizations (No. 47398_06_006), Implementing Agency: Biologists Association, in collaboration with European Community Biologists Associations (ECBA), and CYMEPA, Project Supporter: UNDP - ACT.
2004
Consultant - Researcher - Environmental Impact Assessment of Çandarlı Bay Port, Dolsar Engineering Company, İzmir, Turkey
2002 – 2005
Project Manager - Evaluation of Marine Biodiversity and Habitats of North Cyprus Coastal Zone, North Cyprus. Supported by Ministry of Environment, Turkish Republic of Northern Cyprus.
2002 - 2005
Researcher - Sea turtle conservation and monitoring project of Belek, Antalya, Supported by: BETUYAP, Antalya, Turkey.
2000 - 2001
Researcher, Long Term Development Plan of Ayvalık Islands Natural Park, Ege Plan A.Ş., Supported by Ministry of Environment, Turkey.
1998 - 2000
Researcher - Toxic effects of pollutants on fishes living in the Sarıyar Dam Lake and its creeks, Beypazarı/Ankara. Supported by Technical Research Council of Turkey (TÜBİTAK).
2000
Researcher - Sea turtle conservation and monitoring project of Belek, Antalya, Supported by: BETUYAP, Antalya, Turkey.
2000
Scientific Consultant – Preperation of Middle/High School Multimedia Education CD-ROM Series (Kidsplus), Project owner: Meteksan Sistem, Ankara/Turkey.
1995-1999
Researcher - Keban Dam Reservoir Limnology and Fisheries, Elazığ-Malatya-Tunceli/Turkey. Supported by Scientific and Technical Research Council of Turkey (TÜBİTAK), State Hydraulic Works, Hacettepe University, Middle East Technical University.
1997-1999
Consultant-Researcher (for ENCON Environmental Consultancy Company - Investigation of Biological and Ecological Aspects of Wetlands Having International Importance Project, Sub Project II, Kırşehir-Kayseri-Sivas-Adana/Turkey. Supported by Ministry of Environment.
1998
Researcher - Principles of Management Plan for Protection of Sea Turtles in Specially Protected Areas. Supported by Ministry of Environment, Turkey.
1997-1998
Consultant-Researcher (for ENCON Environmental Consultancy Company), Environmental Impact Assessment of Artvin Dam and Hydroelectric Power Plant Project, Artvin/Turkey. Project Owner: SPIE Batignolles, France and DOĞUŞ Construction, Turkey.
1997-1998
Consultant-Researcher (for ENCON Environmental Consultancy Company), Environmental Impact Assessment of Yusufeli Dam and Hydroelectric Power Plant Project, Yusufeli - Artvin/Turkey. Project Owner: SPIE Batignolles, France and DOĞUŞ Construction, Turkey.
1997-1998

Consultant-Researcher (for ENCON Environmental Consultancy Company), Environmental Impact Assessment of Aslancik Dam and Hydroelectric Power Plant Project, Dogankent-Giresun/Turkey. Project Owner: DOĞUŞ Construction and Trade Corp., Turkey.
1997-1998
Researcher - Principles of Management Plan for Protection of Sea Turtles in Western Coast of Mediterranean, Supported by Ministry of Environment, Turkey.
1995-1998
Consultant-Researcher (for ENCON Environmental Consultancy Company), Environmental Impact Assessment of Boyabat Dam and Hydroelectric Power Plant Project, Boyabat - Sinop/Turkey. Project Owner: DOGUS Construction and Trade Corp., Turkey.
1996-1997
Researcher - Determination of Natural Criterions for Eastern Mediterranean Management Plan, Supported by Scientific and Technical Research Council of Turkey (TÜBİTAK).
1995-1997
Assistant Researcher - Wetland Management Plan of Manyas Lake Project, Supported by Ministry of Environment, Turkey.
1995-1997
Researcher - Management Plan for Protection Purposes of Sea Turtles, Supported by Ministry of Environment, Turkey.
1995
Assistant Researcher - Important Limnological Parameters of Mogan Lake, Supported by Hacettepe Universty Research Fund.
1993
Field Trainer and Team Leader (Volunteer) - Population Biology of Sea Turtles (Caretta caretta) in Dalyan and Patara Beaches, Supported by Specially Protected Areas.

REPORTS
2019
Coastal Zone Management Plan for Iskele, İskele Municipality
2015
Management Plan of Famagusta Coastal Zone, Famagusta Municipality
2014
Monitoring Kalecik (AKSA) Oil Spill, TRNC Ministry of Natural Resources and Environment
2013
Management Plan for Gokova Bay Marine Protected Areas and Selimiye – Orhaniye SEPA's General Directorate of Specially Protected Areas of Turkey, Ankara, Turkey.
2011
Monitoring of Gokova Bay Marine Protected Areas, General Directorate of Specially Protected Areas of Turkey, Ankara, Turkey.
2010
Management Plan for Karpaz SEPA, European Commission.
2010
Management Plan for South Karpaz Beaches, European Commission.
2009
Baseline study for Karpaz SEPA, European Commission.
2009
Baseline study for South Karpaz Beaches, European Commission.
2001
Long Term Development Plan of Ayvalık Islands Natural Park, Final Report, Ministry of Environment.
1999
Investigation of Biological and Ecological Aspects of Wetlands Having International Importance, Sub Project II, Final Report, Ministry of Environment.
1997
Wetland Management Plan of Manyas Lake, TR Ministry of Environment.

PUBLICATIONS

Thesis
Çiçek, B. A., 2006, Investigation of Biodiversity of Turkish Republic of North Cyprus Coastal Zone, Ph. D. Thesis submitted to Institute of Science, Hacettepe University.

Çiçek, B. A., 1999, Hydroacoustic Approaches to Fish Stock Assessment in Keban Dam Lake, M. Sc. Thesis submitted to Institute of Science, Hacettepe University.

Articles, Papers, Posters and Presentations

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Omeyer, L.C.M., Stokes, K.L., Beton, D., Çiçek, B.A., Davey, S., Fuller, W.J., Godley, B.J., Sherley, R.B., Snape, R.T.E. and Broderick, A.C., 2021. Investigating differences in population recovery rates of two sympatrically nesting sea turtle species. *Animal Conservation*.

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Akbora, Hasan Deniz, Burak Ali Çiçek, and Deniz Ayas. "The first record of Synanceia verrucosa Bloch & Schneider, 1801 and Pagrus auriga Valencienne, 1843 from Cyprus." *J. Black Sea Mediterr. Environ* 27 (2021): 109-116.

Akbora, Hasan Deniz, Robin Snape, A. Y. A. S. Deniz, and Burak Ali Çiçek. "The first substantiated record of blunthead puffer Sphoeroides pachygaster (Müller and Troschel, 1848), from the coast of northern Cyprus (eastern Mediterranean)." *Marine Science and Technology Bulletin* (2021): 1-7.

Snape, Robin Thomas Ernest, Burak Ali Çiçek, Louis Hadjioannou, Ayaka Amaha Öztürk, and Damla Beton. "Two sperm whale (Physeter macrocephalus) sightings in Cyprus from social media." *Journal of the Black Sea/Mediterranean Environment* 26, no. 2 (2020).

Akbora, Hasan Deniz, İmge Kunter, Tuğba Erçetin, Ali Murat Elagöz, and Burak Ali Çiçek. "Determination of tetrodotoxin (TTX) levels in various tissues of the silver cheeked puffer fish (Lagocephalus sceleratus (Gmelin, 1789)) in Northern Cyprus Sea (Eastern Mediterranean)." *Toxicon* 175 (2020): 1-6.

Deniz, A. Y. A. S., Hasan Deniz AKBORA, and Burak Ali ÇİÇEK. "Occurrence of the Young Thresher Shark Alopias superciliosus Lowe, 1841 (Lamniformes: Alopiidae) in the Northeastern Mediterranean Sea." *Commagene Journal of Biology* 4, no. 1 (2020): 28-31.

Akbora, Hasan Deniz, Erdi Bayri, Deniz Ayas, and Burak Ali Çiçek. "Recent record of Odontaspis ferox (Risso, 1810) in Northern Cyprus (Eastern Mediterranean Sea)." *J. Black Sea./Medit. Environ* 25, no. 3 (2019): 315-320.

Jimenez, C., P. Patsalou, V. Andreou, M. F. Huseyinoglu, B. A. Çiçek, L. Hadjioannou, and A. Petrou. "Out of sight, out of reach, out of mind: Invasive lionfish Pterois miles in Cyprus at depths beyond recreational diving limits." In *Proc 1st Mediterranean Symp Non-Indigenous Species, Antalya, Turkey*, pp. 17-18. 2019.

Vecchioni, Luca, Federico Marrone, Alan Deidun, Béatrice Adepo-Gourene, Carlo Froglia, Arnold Sciberras, Michel Bariche, Ali Çiçek Burak, Maria Foka-Corsini, and Marco Arculeo. "DNA Taxonomy confirms the identity of the widely-disjunct Mediterranean and Atlantic populations of the tufted ghost crab Ocypode cursor (Crustacea: Decapoda: Ocypodidae)." *Zoological Science* 36, no. 4 (2019): 322-329.

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CD – ROM
Kidsplus Multimedya Education Series, Meteksan System, 2000, Ankara.

OTHER ACADEMIC ACTIVITIES

Editor, Proceedings books of the International Symposia on Underwater Research, Famagusta, TRNC.
Organising and Scientific Committee Member, International Symposia on Underwater, Famagusta, TRNC.
Assistant Editor, Turkish Journal of Aquatic Life, Special Edition for National Water Days Symposium, 2003, Ankara, Turkey.
Symposium Organisation Committee Member, National Water Days Symposium, 2003, Ankara, Turkey.
Lecturer, Fish Stock Management and Computer Applications for Fish Stock Management; Organized by Ministry of Agriculture and Rural Affairs, Bodrum, Turkey.

AWARDS

"Jale İNAN Underwater Archaelogy Photography Competition – Digital Category" First Place, 4 th International Kemer Underwater Days, 16-19 May 2005, Kemer, Antalya.
"Jale İNAN Underwater Archaelogy Photography Competition – Digital Category" Second Place, 4 th International Kemer Underwater Days, 16-19 May 2005, Kemer, Antalya.
"Jale İNAN Underwater Archaelogy Photography Competition – Digital Category" Third Place, 4 th International Kemer Underwater Days, 16-19 May 2005, Kemer, Antalya.
First International Eastern Mediterranean Underwater Photography and Film Festival – Digital Photography Category, Third Place, 24-26 March 2005, TRNC.
"Jale İNAN Underwater Archaelogy Photograph Competition – Digital Category" Second Place, 3 rd International Kemer Underwater Days, 16-19 May 2004, Kemer, Antalya.
"Nurdoğan ÖZKAYA Underwater Nature Photograph Competition – Digital Category" Second Place, 3 rd International Kemer Underwater Days, 16-19 May 2004, Kemer, Antalya.
"Nurdoğan ÖZKAYA Underwater Nature Photograph Competition – Digital Category" Youth Award, 3 rd International Kemer Underwater Days, 16-19 May 2004, Kemer, Antalya.

COURSES TAKEN
2008
Introduction to GIS, Organised by John Moores University, Liverpool and TEKNOPARK, Famagusta, North Cyprus.
2006
Ecological Management in Natura 2000, Organised by UNDP-PFF, Nicosia, TRNC.
2003
Introduction to ArcGIS I and II, Organised by İşlem GIS, Ankara in the name of Environmental Systems Research Institude Inc.
1998

Advanced Methods in Systematics; Organised by Imperial College of Science, Technology and Medicine, London; Cumhuriyet Universty, Sivas; Natural History Museum, London; Sivas, Turkey.
1998
Fish Stock Management and Computer Applications for Fish Stock Management; Organized by Ministry of Agriculture and Rural Affairs, Bodrum, Turkey.
1997
Photography Course; Organized by Photography Society of Hacettepe University.
1996
Hydroacoustic Methods; Organized by State Hydraulic Works, SIMRAD-Norge; Elazığ, Turkey.
1993
Amateur Seamanship Course; Organized by Middle East Technical University-CEC; Ankara, Turkey.
1991
CMAS Diving Course; Organized by Underwater Sports Society of Hacettepe University, Ankara and Bodrum, Turkey.

SCHOLARSHIP

1997-1998
Scientific and Technical Research Council of Turkey (TÜBİTAK).

EDUCATIONAL ACTIVITIES

Course Code	Course Title	Position	Institution
BIOL 316	Environmental Management	Instructor	Eastern Mediterranean University
BIOL 119	Ecology and Environment	Instructor	Eastern Mediterranean University
BIOL 121/122	General Biology	Instructor	Eastern Mediterranean University
BIYO 201/202	Biology	Instructor	Eastern Mediterranean University
BIYO 111	General Biology (Turkish)	Instructor	Eastern Mediterranean University
BIO 201	Human Biology	Instructor	Eastern Mediterranean University
PCON 203	Human Environment	Instructor	Eastern Mediterranean University
BIYO 205	Introduction to Anatomy and Physiology	Instructor	Eastern Mediterranean University
BIO 422	Ecology	Research Assistant	Hacettepe University
BIO 101	General Biology I	Research Assistant	Hacettepe University
BIO 102	General Biology II	Research Assistant	Hacettepe University
BIO 209	Invertebrates	Research Assistant	Hacettepe University
BIO 210	Vertebrates	Research Assistant	Hacettepe University
BIO 240	Protozoology	Research Assistant	Hacettepe University