REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANIZATION
GENERAL DIRECTORATE FOR
PROTECTION OF NATURAL ASSETS

MANAGEMENT PLAN FOR THE NATURAL PROTECTED AREAS OF THE WETLAND AND BIRD PARADISE IN THE KIZILIRMAK DELTA IN SAMSUN

2019-2023

REPUBLIC OF TURKEY

MINISTRY OF ENVIRONMENT AND URBANIZATION

GENERAL DIRECTORATE FOR PROTECTION OF NATURAL ASSETS

NATURAL PROTECTED AREAS OF THE WETLAND AND BIRD PARADISE IN THE KIZILIRMAK DELTA IN SAMSUN

2019-2023 MANAGEMENT PLAN

ANKARA

INDEX

INDEX OF TABLES

INDEX OF FIGURES

INDEX OF PHOTOGRAPHS

1. INTRODUCTION

FOREWORD

Rapidly increasing world population, unplanned urbanization and industrialization, infrastructure investments, widespread use of chemical fertilizers and pesticides in agriculture, along with the numerous innovations introduced, have led to a number of environmental problems such as fast consumption of natural sources, air and water pollution. For this reason, protection and sustainability of natural sources has been one of the most important concerns of humanity in the 21st century. Finding its roots in the 18th and 19th centuries in Europe, first time the Industrial Revolution appeared in the United Kingdom, and spread to West Europe, North America, and Japan, and then it is entired to the other world. However, life has become easier with the development of industry. Peoples have always ignored to damage the environment, and to forget nature's law about that every gain has a loss.

Countries that accelerating their development with industry, after they have noticed the negativity and have concluded that making peace with nature is more important than fighting it. By taking important steps towards this situation, human being wants to leave a healtier world for themselves and future generation. In this context, the Management Plan prepared for the protected areas. It is the most important tool used to determine is to be protected area, how the area to be prepared and how to develop, manage the actions to solve the problems.The Management Plan is the identification of natural and cultural resources for the area in which it is prepared, the identification of threats to resources and the development of strategies and implementation plans for long-term protection of the area.

Within this context, the Management Plan prepared for protected areas is the most important tool used to determine how to protect the specific area and how to develop and manage the actions for the solution of problems. Management Plan is to define the natural and cultural sources for the specific area, set the threats against sources, and develop the strategies and implementation plans for the long-term protection of the area.

The concept of the Management Plan, which has already begun to understood in our country, has began to be applied in Special Environmental Protection Regions and spread to areas with protection status in other regions. Kızılırmak Delta that is one of the largest deltas and also great importance for Turkey; keeping habitats with different ecological characters together, such as sea, river, lake, reed, marsh, meadow, pasture, forest, dune, and agricultural site, having a rich biological diversity, and the number of birds hosted.

The Management Plan has been prepared in order to protect the natural beauty of the delta in a holistic manner and to be transmitted to future generations and also to be presented to the UNESCO World Heritage Permanent List.

Wishing the Management Plan for the Natural Protected Areas of the Wetland and the Bird Paradise in the Kızılırmak Delta to be beneficial for the whole region I would like to extent my sincere thanks first to the staff of our General Directorate and all related institution and organisation who contributed.

Mehmet Ali KAHRAMAN
General Director

1. INTRODUCTION

Throughout history, mankind has preferred the deltas, floodplains, and the banks of a river or lake as a living environment. This dependence upon wetland continues today as well thanks to the benefits and values it serves. Approximately 300 thousand hectares of wetland have lost its function in Turkey within last 40 years, where 1.2 million hectares of wetland are under risk due to anthropogenic activities such as destruction of habitats and excessive use of water and factors such as climate change. Therefore, development of a common management strategy by the stakeholders of the area is an important step for providing protection and reasonable utilization of these ecosystems rich in biological diversity.

Being a quite significant wetland in our country in terms of biological diversity and agricultural production, the Natural Protected Areas of the Wetland and Bird Paradise in the Kızılırmak Delta has sources important at a national and global degree. Located within the borders of the Ondokuzmayıs, Bafra, and Alaçam districts of the Samsun province, where the River Kızılırmak runs into the Black Sea, the Kızılırmak Delta is one of the two natural areas enlisted in UNESCO's World Heritage Tentative List, for which efforts are carried away to enlist the same into the permanent list in 2018.

Determining the principles of protection and utilization of the Natural Protected Areas of the Wetland and Bird Paradise in the Kızılırmak Delta throughout the process of UNESCO's World Heritage Permanent List and preparing a management plan that involves activities at the phase of taking protective measures are the most important objectives of this project.

1.1. GROUNDS OF THE PROJECT

In accordance with both our national legislation and international liabilities that cover paragraph (b) of Article no. 13/A-1 of the Statutory Decree no. 644 on the Establishment of the Ministry of Environment and Urbanization, paragraph (f) of the Article no. 5 of the Regulations on the Principles and Procedures of Setting, Registering, and Approving the Protected Areas**,** National Biological Diversity Strategy and Action Plan, and acts for the protection of nature (the Ramsar Convention, the Barcelona Convention, and its annex Protocol on Biological Diversity and Special Protected Areas in the Mediterranean, the Bern Convention, and Biological Diversity Act), management plans are made for the protected areas.

Accordingly, the Natural Protected Areas of the Wetland and Bird Paradise in the Kızılırmak Delta in Samsun contain various habitats that are worth protecting with its rich vegetation cover along with animal species of about 355 bird species, water buffaloes, jades, sea otters, wild cats, fish, reptilians, amphibians, etc. The delta's

accommodating various habitats such as sea, river, lake, reed, marsh, meadow, pasture, flooded forest, dune, and agricultural areas together makes it uniquely important.

Area management is handled as a concept with an individual sensitivity in national and international regulations and acts. **The World Heritage Centre** holds it obligatory for any area **suggested and announced as a world heritage and enlisted in the World Heritage List** to have a management plan. The importance of management and protection of an area is emphasized in the **Guide on Implementation of the World Heritage Convention** with the sentences: *"Each asset should have an appropriate management plan or a management system that describes how to protect the outstanding universal value of the asset through participatory ways. The purpose of this management system is to provide efficient protection of the asset for the current and next generations."*

Within this context, protection of the Kızılırmak Delta in a holistic way and carrying the unmatched variety of habitats and flora and fauna characteristics within the area to future generations have become prior for the institutions and organizations in charge, mainly the General Directorate for Protection of Natural Assets.

1.2. PROJECT SITE

River Kızılırmak, which springs from Kızıldağ (3025 m.) located on the east of İmranlı District in Sivas Province and flows through Sivas, Kayseri, Nevşehir, Kırşehir, Kırıkkale, Çankırı, and Samsun provinces for about 1.355 km, and then runs into the Black Sea at Cape Bafra, has formed the most important delta plain at the Turkish coast of Black Sea and the wetlands complex with the alluvial deposits it carries out.

About 11.600 hectares of the delta with a total area of 56.000 hectares consist of wetland ecosystems and natural and semi-natural areas that involve habitats related with these systems. The delta's accommodating various habitats such as sea, river, lake, reed, marsh, meadow, pasture, flooded forest, dune, and agricultural areas together has made the delta have a uniquely important biological diversity. The Kızılırmak Delta Wetland and Bird Paradise located on the north of Samsun-Sinop highway, within the borders of the Samsun province and Bafra, 19 Mayıs, Alaçam districts was nominated as a Natural Protected Area in 1994 (Priority 1 Natural Protected Area - 19.857 hectares, Priority 2 Natural Protected Area – 63 hectares, Priority 3 Natural Protected Area – 3766 hectares).

1.3. PURPOSE OF THE PROJECT

The main purpose of the project is to provide efficient protection of the Natural Protected Areas of the Wetland and Bird Paradise in the Kızılırmak Delta in Samsun in a holistic way for the current and future generations in a participatory approach with all stakeholders. The Kızılırmak Delta's being enlisted in UNESCO's World Heritage List means registration of the outstanding universal value of the delta, recognition by the whole world, and acceptance as a common world heritage.

Under this project, the aim is to prepare a management plan in order to protect and develop the outstanding universal value held by the area for today's and future generations and to carry out short-middle-long term actions for this purpose.

1.4. SCOPE OF THE PROJECT

The protected area is established within a system of complicated relationships where cultural, socio-economical and environmental factors are in effect. The "Code of Protection of Cultural and Natural Assets", which came into force through law no. 2863 in 1983 is still in force with various annexes in our country, and it is aimed to provide functionality to the protected area by setting the scope, management, and implementation, based on the framework drawn in international bylaws and declarations. The socio-economic, political, and cultural changes in the 20th century set forth the need to revise the definition of the protected area.

Therefore, protection status was moved from the monument scale to area/ environment scale and was extended to involve physical/ geographical characteristics of a place, as well as its natural structure (Kamacı, 2014).

As the concept of common heritage of humanity was adopted at international level, the "Convention concerning the Protection of World Cultural and Natural Heritage" (1972) was signed by UNESCO and came into force in 1975. With the convention, beside protection of cultural assets, the concepts of "common heritage" and "protection of natural heritage" took place in international legislative regulations for the first time. Turkey became a party to the "World Heritage Convention" with the Cabinet Decree dated 1982 and no. 8/4788 and the convention came into force upon being published in the Official Gazette dated 1983 and no. 17959 (Kamacı, 2014). Thus, any cultural and natural asset that is under warranty of protection of the signatory country, which has outstanding universal values is called world heritage. For an area to be enlisted in the World Heritage List, it should fulfil at least one of the six cultural and four natural criteria for measuring its outstanding universal value, as set by the World Heritage Committee. These criteria are as follows:

1. To represent a masterpiece of human creative genius,
2. To exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design,
3. To bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared,
4. To be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history,
5. To be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change,
6. To be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance,
7. To contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance,
8. To be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features,
9. To be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals,
10. To contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

Being evaluated within this context, the Kızılırmak Delta was enlisted in UNESCO's World Natural Heritage tentative list on 13th April 2016, fulfilling the 7th and 10th criteria for being enlisted in UNESCO's World Heritage List. For the delta to be enlisted in UNESCO's World Heritage Permanent List, application shall be submitted on behalf of our country in "natural asset" category in 2018.

The management plans in similar areas enlisted in UNESCO's World Heritage List (e.g.: Operational Guidelines for the Implementation of the World Heritage Convention of UNESCO, 2016; Development of a Management Planning Framework for Ecosystem Management and Biodiversity Conservation in the Iraqi Marshlands, Management Planning Framework Report, 2012), previously issued Management Plan of the Kızılırmak Delta for the terms 2008-2012 and 2016-2020, literature

reviews, and site observations were made use of for the current management plan. The management plans of the wetlands enlisted in UNESCO's World Heritage List with similar characteristics with the Kızılırmak Delta and the management plans of the wetlands in our country were analyzed and the entities authorized at decision-making and implementation phases of the area were interviewed and a sustainable management model was prepared. The "management plan" prepared for a protected area was designed to be transparent, including participation of all stakeholders, determining the priorities, problems, threats, and opportunities of the delta, setting targets to solve the problems and prevent the threats in accordance with the vision set forth for the future of the area; and designating basic strategies and action plans to attain these objectives.

2. DESCRIPTION

Grey Heron » Ardea cinerea

2. DESCRIPTION

2.1 DESCRIPTION OF THE AREA

2.1.1. Location, Definition, and Borders of the Area

The Kızılırmak Delta, formed out of the alluvial deposits carried by the River Kızılırmak, which springs from Kızıldağ (3025 m.) located on the east of İmranlı District in Sivas Province and flows through Sivas, Kayseri, Nevşehir, Kırşehir, Kırıkkale, Çankırı, and Samsun provinces, and then runs into the Black Sea at Cape Bafra, is the most important delta plain at the Turkish coast of Black Sea and the wetlands complex. Located within the second largest river basin in Turkey, the Delta has a total area of 56.000 hectares within the borders of the Bafra, 19 Mayıs, and Alaçam districts. The total natural protected area of priority 1 is 19770,3 ha, total natural protected area of priority 2 is 63,02 ha, and total natural protected area of priority 3 is 3764,2 ha. The majority of the area (~11.000 ha) is a wetland and accommodates various habitat types such as sea, river, lake, reed, marsh, meadow, pasture, flooded forest, dune, and agricultural sites.

There are a number of large and small lakes within the Kızılırmak Delta. The main ones are Lake Balık (1389 ha), Lake Cernek (589 ha), Lake Liman (272 ha), Lake Gıcı (125 ha), Lake Tatlı (52 ha), Lake Uzun (293 ha), and Lake Karaboğaz (170 ha). Apart from these, there are also Lake Altınlı, Lake Sülüklü, and Lake Mülk (Yeniyurt et al. 2008).

The protected areas within the borders of the Lower Basin of Bafra in Samsun Province of the Natural Protected Areas of the Wetland and Bird Paradise in the Kızılırmak Delta are given in the following map (Figure 2.1.).

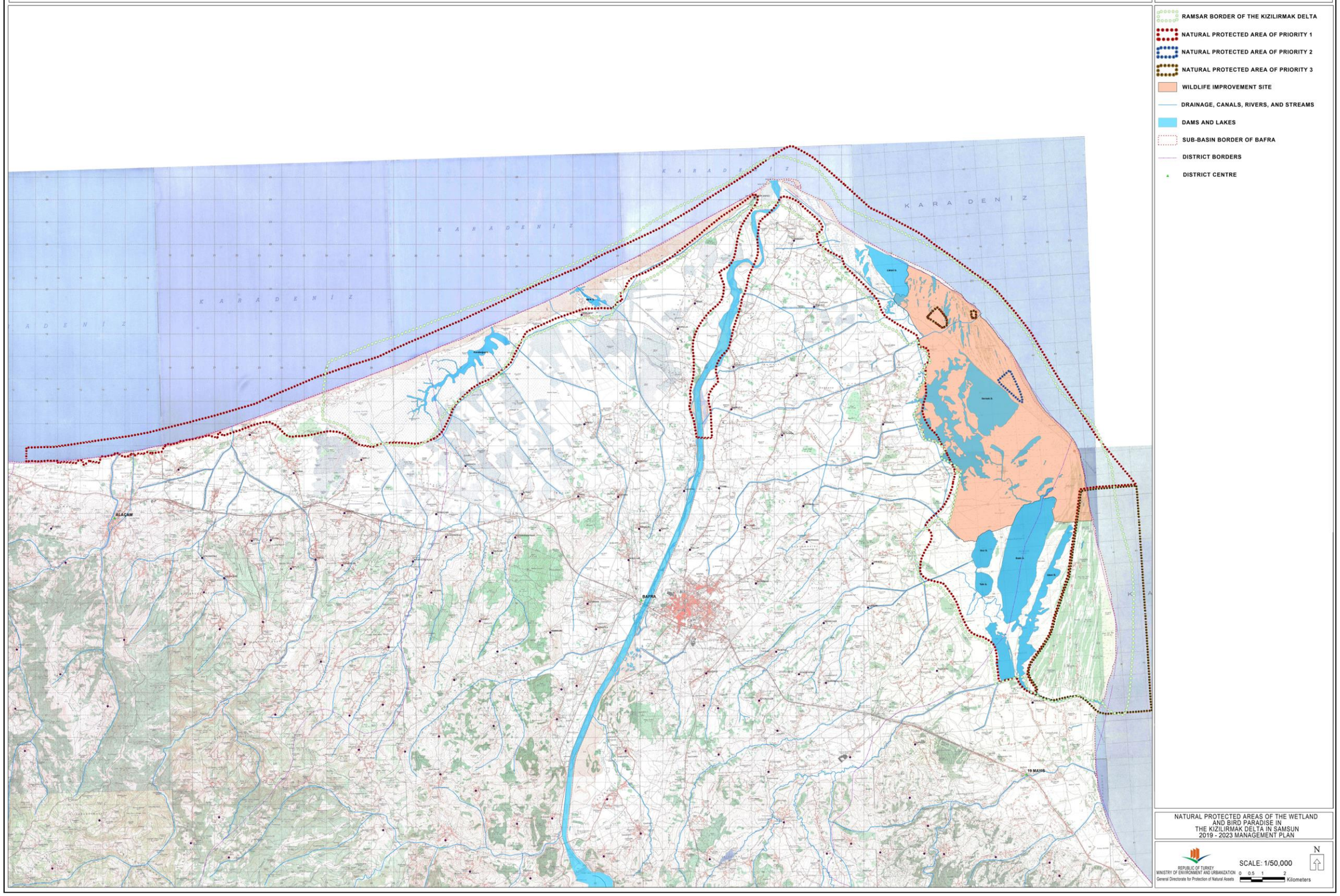


Figure 2.1. The position of the Natural Protected Areas of the Wetland and Bird Paradise in the Kızılırmak Delta within the borders of Samsun Province

2.1.2. Ownership Status

A number of institutions and organizations are in charge of the Delta. The total size of the Natural Protected Areas of Priority 1, 2, and 3 in an attached position in the Delta is 23597,49 ha and it is within boundaries of authority of the General Directorate for Protection of Natural Assets of the Ministry of Environment and Urbanization. As majority of the site (~11.000 ha) is a wetland and is a Ramsar area, the General Directorate for Nature Conservation and National Parks of the Ministry of Forestry and Water Affairs has been carrying out conservation activities in the area. Along with this, General Directorate for State Hydraulic Works, General Directorate of Forestry, and Ministry of Food, Agriculture, and Livestock are the other public bodies with roles and responsibilities in the area within framework of a different national legislation.

The areas within the Kızılırmak Delta are classified as public property, personal property, and disputed property. Majority of the areas owned by individuals are used as housing and agricultural areas. There are many lands within the delta in dispute between individuals and between individuals and the government. The entirety of the wetland ecosystems and coastal dunes are lands out of registry and exempted from land registration (2008-2012 Management Plan of the Kızılırmak Delta).

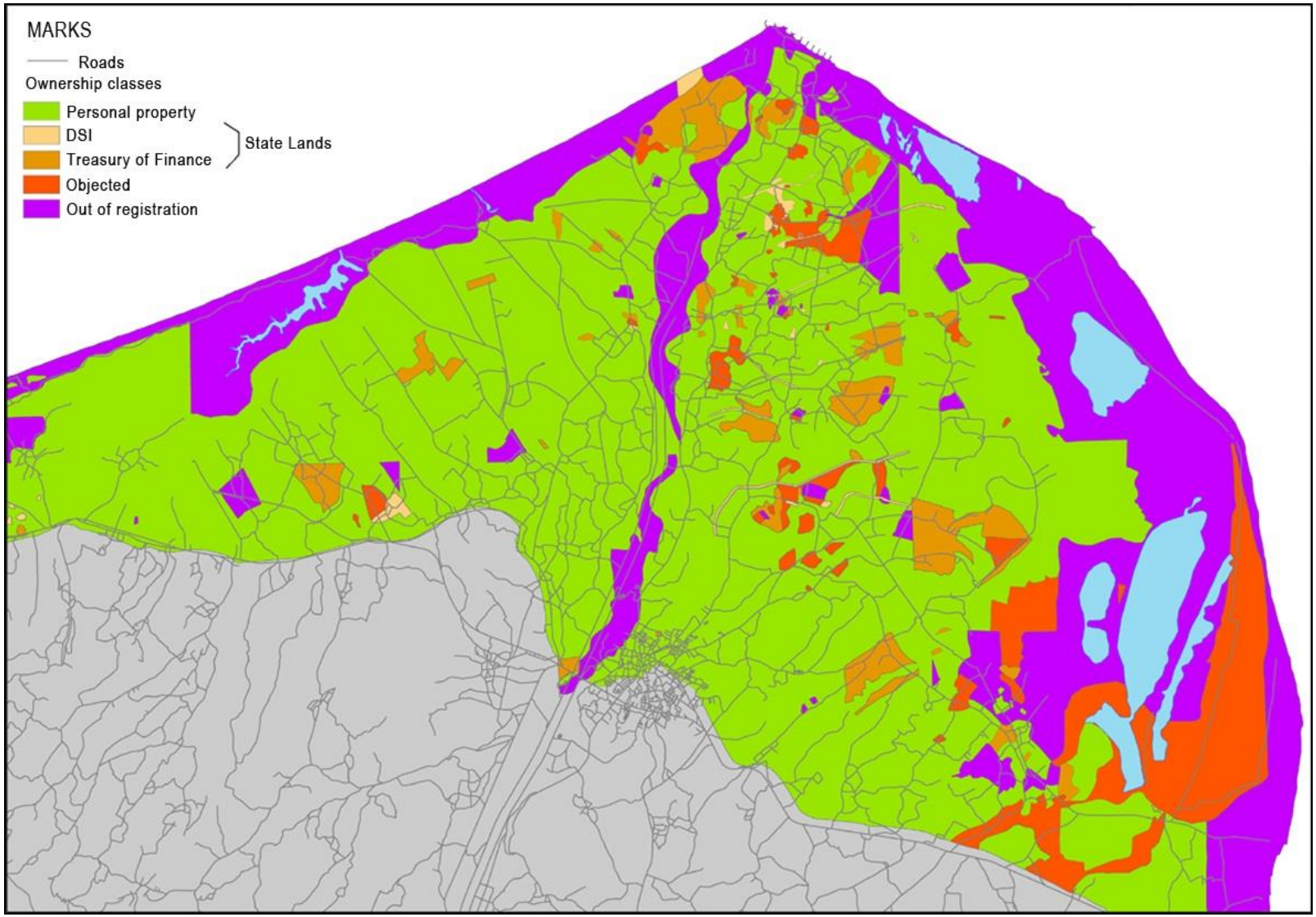


Figure 2.2. Ownership Status (2016-2020 Wetland Management Plan)

2.1.3. Management Structure

There are Natural Protected Areas of Priority 1, 2, and 3, Wildlife Improvement Area, and Ramsar Site statuses within the Kızılırmak Delta for protection of the natural life. Besides, there are zones announced as Agricultural Sites in Bafra Plain on the right and left banks of the River Kızılırmak, located on the south of Natural Protected Area of Priority 1 and the Ramsar Site.

Natural Protected Areas: According to the Code of Protection of Cultural and Natural Properties no. 2863, "any area on the ground, underground, or under water that dates back to geological, ancient, and historical eras, which requires protection for its rareness or thanks to its characteristics and beauties" may be announced as a natural protected area. The majority of the Kızılırmak Delta was taken under protection as a Natural Protected Area, since it has a wide range of biodiversity with Priority 1 on 21.4.1994, and then Priority 2 and Priority 3.

- *Natural Protected Area of Priority 1*: According to the Leading Decision concerning the Requirements of Conservation and Utilization, an area with a universal value in terms of scientific protection, which must be protected for public interest because of having outstanding features and beauties, which is to be protected in-situ, where no activity is feasible other than any scientific study for the purpose of protection.
- *Natural Protected Area of Priority 2*: An area which might be put into service considering the public interest, along with protection and improvement of the natural structure. In such areas, no building is allowed other than touristic facilities with a tourism investment and tourism management certificate and service purpose buildings.
- *Natural Protected Area of Priority 3*: An area which might be put into service for house building, considering the potential and utilization of the locality, for the purpose of protecting and improving the natural structure. Any village complexes within a natural protected area of priority 1 and 2 will be considered as a natural protected area of priority 3.

Wildlife Improvement Area: Lake Cernek and its surroundings were taken under protection as a Wildlife Improvement Area in 1979. This status was changed with the new Land Hunting Law and turned into Wildlife Improvement Area. The Kızılırmak Delta fulfils the criteria of a wildlife improvement area with the bird species and waterfowls it hosts. No activity and construction is allowed in wildlife protection and improvement areas other than the ones included in management and improvement plans.

Ramsar Site: The delta was included in the Ramsar List in 1998 within framework of the Ramsar Convention, to which Turkey is a party. The Kızılırmak Delta is the only

area in our country that fulfils 8 out of the 9 criteria set for the determination of internationally important wetlands.

Agricultural Site: With the letter of the Ministry of Food, Agriculture, and Livestock dated 21.11.2016 and no. 12636, the Council of Ministers decided on 12.12.2016 to put the decision into force concerning designation of some plains as a large plain protected area, according to Article 14 of the Law dated 03.07.2005 and no. 5403. In accordance with the annexed Article 1 of the decree dated 12.12.2016 and no. 2016/9620; any plain with a high potential of agricultural production, where soil loss and land deformation develops quickly due to various reasons such as erosion, pollution, out of purpose use or misuse, with names and borders listed in the enclosed list and maps have been set as large plain protected areas (Agricultural Site). Any confirmed and planned area within the borders of the plains and any area allowed to be used for non-agricultural purposes in accordance with the concerning regulations as of the publishing date of this decision have been excluded from the scope of the first clause. Accordingly, the Bafra Plain in Samsun Province was also nominated as a Large Plain Protected Area (Agricultural Site) with the mentioned decision.

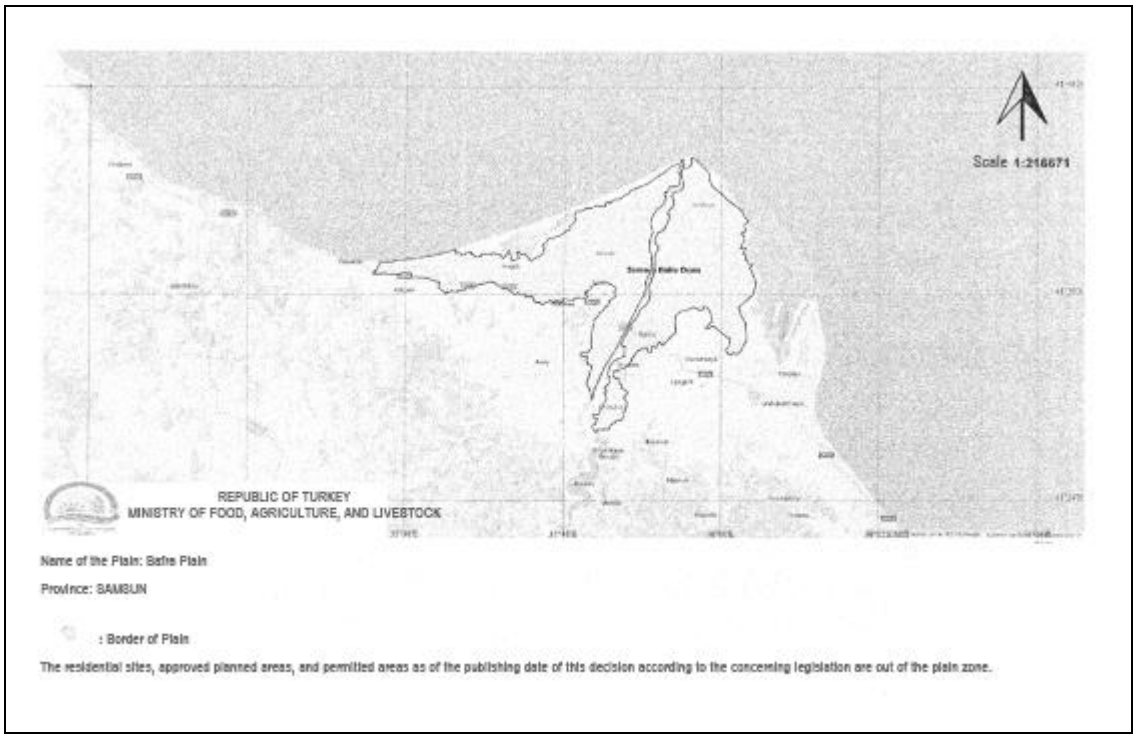


Figure 2.3. Bafra Plain Agricultural Site, Annex to the Decision no. 2016/9620

Management of the Natural Protected Areas in the Kızılırmak Delta is the liability of the General Directorate for Protection of Natural Assets of the Ministry of Environment and Urbanization, based on the Statutory Decrees no. 644 and 648 on the Organization and Functions of the Ministry of Environment and Urbanization. As it is a registered wetland with a Ramsar Site character, the delta is also under authority and responsibility of the

General Directorate for Nature Conservation and National Parks of the Ministry of Forestry and Water Affairs. Besides, General Directorate for Protection of Natural Assets of the Ministry of Environment and Urbanization also established the Wetland and Bird Paradise Area Head Office of the Kızılırmak Delta in order to provide implementation of the management plan in the Kızılırmak Delta and local management of the area.

Table 2.1 Main institutions and organizations responsible for and related to the management of the Kızılırmak Delta

Name of the Institution/ Organization	Relation	Concerning Legislation
General Directorate for Protection of Natural Assets of the Ministry of Environment and Urbanization	The area's being a natural protected area	Statutory Decrees no. 644 and 648 on the Organization and Functions of the Ministry of Environment and Urbanization Code of Protection of Cultural and Natural Assets no. 2863
Ministry of Forestry and Water Affairs Directorate General for Nature Conservation and National Parks Directorate General for Water Management Directorate General for State Hydraulic Works	Wildlife improvement area Ramsar site Wetland ecosystem Managem Directorate General for Nature Conservation and National Parks ent of underground and surface waters	Statutory Decree no. 645 on the Organization and Functions of the Ministry of Forestry and Water Affairs Ramsar Convention Land Hunting Law no. 4915 Decisions of Central Hunting Commission Regulation on Protection of Wetlands Law no. 6200 on the Organization and Functions of the General Directorate of State Hydraulic Works
Ministry of Food, Agriculture, and Livestock	Agriculture and livestock areas, Agricultural Site Aquaculture production field	Statutory Decree no. 639 on the Organization and Functions of the Ministry of Food, Agriculture, and Livestock, decree dated 12.12.2016 and no. 2016/9620
		Law no. 1380 on Aquaculture Products
Ministry of Finance	Public property within the area	Statutory Decree no. 178 on the Organization and Functions of the Ministry of Finance
Ministry of National Education	Consciousness raising education activities in schools and public training centres	Statutory Decree no. 652 on the Organization and Functions of the Ministry of National Education
Directorate General of Security	Inspection and prevention of any illegal activity within boundaries of their authority	Law no. 3201 on the Organization of Public Security
General Command of Gendarmerie	Inspection and prevention of any illegal activity within boundaries of their authority	Law no. 2803 on the Organization, Functions, and Powers of the Gendarmerie
Governorship of Samsun (Related provincial directorates)	Civilian authority	Regulations no. 27958 on the Organization, Functions, and Missions of the Governorship and District Governorship Units of the Ministry of Interior
District Governorship of 19 Mayıs, Alaçam, and Bafra districts (Related district directorates)	Civilian authority	Regulations no. 27958 on the Organization, Functions, and Missions of the Governorship and District Governorship Units of the

Name of the Institution/ Organization	Relation	Concerning Legislation
		Ministry of Interior
Samsun Metropolitan Municipality	Adjacent area in Samsun Metropolitan Municipality	Law no. 5216 on Metropolitan Municipalities
Bafra Municipality	Adjacent area in municipality	Law no. 5393 on Municipalities
Neighbourhood government offices within the borders of Natural Protected Areas in the Kızılırmak Delta	Residential Areas	Village Law no. 442
		Law no. 5393 on Municipalities
Ondokuz Mayıs University	Scientific Studies, Bird Ringing, Bird Influenza Researches, Population Researches, Mid-Winter Waterfowl Counting	Higher Education Law no. 2547
SAMKUŞ	Management of the area	Protocol dated 05.10.2015
Aquaculture Cooperatives in service in the area		
Wetland and Bird Paradise Area Head Office of the Kızılırmak Delta		Approval of the Ministry no. 84901512/10655, dated 15.09.2017, concerning the establishment of the Wetland and Bird Paradise of the Kızılırmak Delta

2.2 NATURAL AND ENVIRONMENTAL DATA

2.2.1. PHYSICAL DATA

2.2.1.1. GEOLOGICAL AND TOPOGRAPHICAL CHARACTERISTICS

The southern border of the delta (approximately the section on the south of the Samsun-Bafra and Alaçam highway) is constituted of Neogene and earlier (Upper Cretaceous flysches, Eocene flysches and volcanites, Miocene and Pliocene old lagoonary and stream deposits, in a generalized manner) rock bodies (Yeniyurt et al., 2008).

Delta deposits consist of four basic units in this area. Current beach deposits that spread along the coast as a thin band and separate the delta from the Black Sea as a set, old beach deposits just in the back, which essentially consist of sand and sandstones, and on the back of this the Doğanca Neighbourhood from the north, Lake Liman on the north and west, and Lake Gernek, Lake Gıcı on the south, Lake Balık, and Lake Uzun, and the current marshes and lagoons that consist of silts and clays of these, and current flooded plain deposits lay along. And on the back of these lay older delta deposits of Kızılırmak, loose sandstones, silt stones, and clay stones over a large area (Ecocentric Scientific Research Report, 2016).

Current coastal wave accumulation deposits lay along the coast line of the delta that looks over the Black Sea. On the back lay along old beach deposits and Kızılırmak Delta deposits, current marsh lagoon deposits, and deposit sites. These units, which are of Late Quaternary and mostly Holocene old were connected and interrupted with

artificial canals and sets at some points in order to prevent the delta from being impacted by the floods and the waves of the Black Sea, and thus to take the same under control. The surroundings of the flooded forest consist of Kızılırmak Delta deposits that are formed of poorly graded and loose Quaternary and Holocene old sand stone, silt stone, silt, sand, and clay, old beach deposits, current flooded plain deposits, and Sarıkum Formation and Gökçeçakmak Formation as older units (Ecocentric Scientific Research Report, 2016).

In morphological terms, the site reflects all the morphological and topographical characteristics of a delta formation. The topography begins with a height of several meters from the sea level and reaches upto one or a few decametres towards the Bafra district. The front and back sites of the delta provide the possibility to discriminate old and new quaternary sets and terraces formed by alluvial and fluvial clastic units that contain natural and artificial canals of the delta at some points (Ecocentric Scientific Research Report, 2016).

Elevation is between 0 and 15 m in the area where the Natural Protected Area of the Wetland and Bird Paradise in the Kızılırmak Delta is located in. Inclination of the area where the natural protected areas are located in is between 0.5% - 2%. Inclination and elevation do not vary in the area which has a natural characteristic of a delta.

2.2.1.2 SOIL TYPES

The soil of the Kızılırmak Delta may be examined in two categories as bottom land and slope land. The slope lands of the Kızılırmak Delta goes along both sides of Kızılırmak towards the south of the plain as a narrow band. The bottom lands at both coasts of Kızılırmak have sufficient inclination (0.5%-2%). Topography of slope lands is generally wavy with an inclination varying between 2% and 20.

When the delta is looked at within the Kızılırmak Basin, it is seen that the majority of the land consists of hydromorphic soils, there are coastal dunes at the sea side, and brown forest soils, colluvial soils, and alluvial soils at interior parts (Yeniyurt et al., 2008).

2.2.1.3. METEOROLOGICAL AND CLIMATIC CHARACTERISTICS

The climate of the Kızılırmak Delta bears all the characteristics of the climate in Samsun. Having a temperate climate in general, there are two different climates in the hinterland and coastal parts of Samsun. The influence of Akdağ and Mount Canik is observed at interior parts, where the influence of the Black Sea climate is seen at the coast (city centre, Terme, Çarşamba, Bafra, Alaçam, Ondokuz Mayıs, Tekkeköy, and Yakakent). Therefore, summer is hot and dry, winter is warm and rainy, and spring is foggy and rainy at the coast.

Below are the graphics and explanations prepared upon evaluations made based on the data of numerous years put out by 2 meteorological stations (Bafra and Samsun Regional) set up to put forward the meteorological properties of the region in the Natural Protected Areas of the Wetland and Bird Paradise in the Kızılırmak Delta in Samsun Province.

Temperature

Samsun Regional and Bafra meteorological stations were selected for temperature analyses in the study area. Annual average temperature data put out by these stations were evaluated in details through tables.

- *Samsun Regional Meteorological Station*

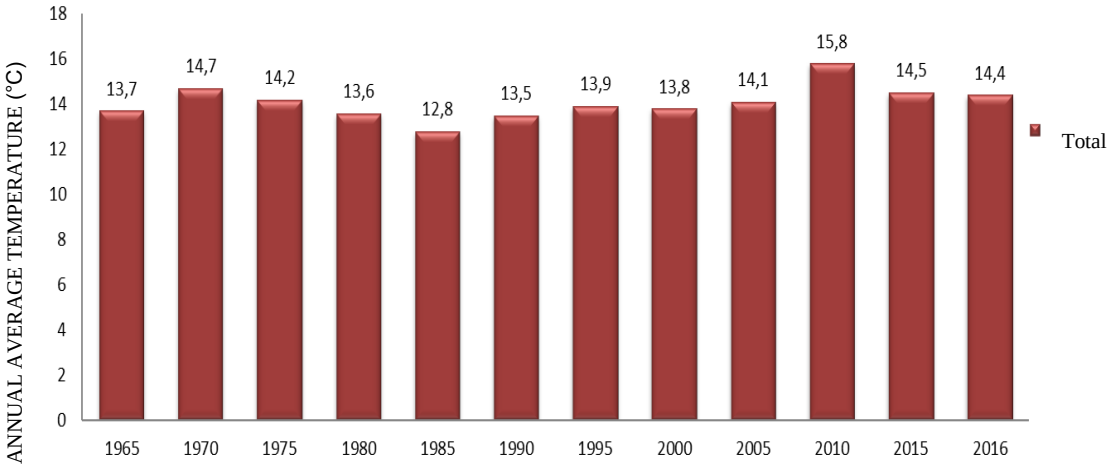
When the annual average temperature (°C) values were examined according to the data obtained from Samsun Regional meteorological station from 1929 to 2016, the average temperature was determined to be maximum 16.6 °C in 2010.

Source: www.mgm.gov.tr

Figure 2.4. Variation of the total average of temperatures in the Samsun province per months

- *Bafra Meteorological Station*

When the annual average temperature (°C) values were examined according to the data obtained from Bafra meteorological station from 1965 to 2016, the average temperature was determined to be maximum 15.8 °C in 2010.



Source: www.mgm.gov.tr

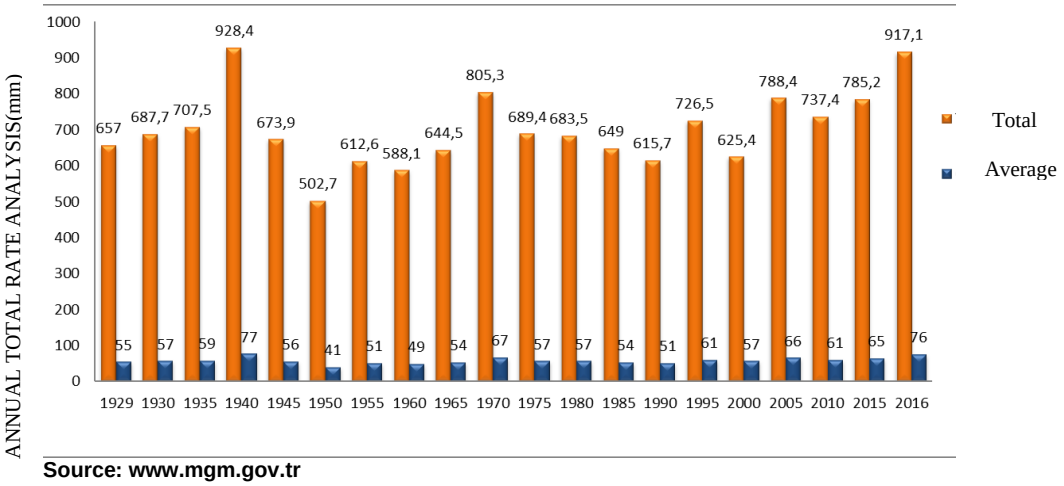
Figure 2.5. Variation of the total average of temperatures in the Bafra district per months

Rain

Samsun Regional and Bafra meteorological stations were selected for rain analyses in the study area. Annual total amount of rain data put out by these stations were evaluated in details through tables.

- *Samsun Regional Meteorological Station*

When the annual average rain (mm) values were examined according to the data obtained from Samsun Regional meteorological station from 1929 to 2016, the total rain was determined to be maximum 928.4 mm in 1940.

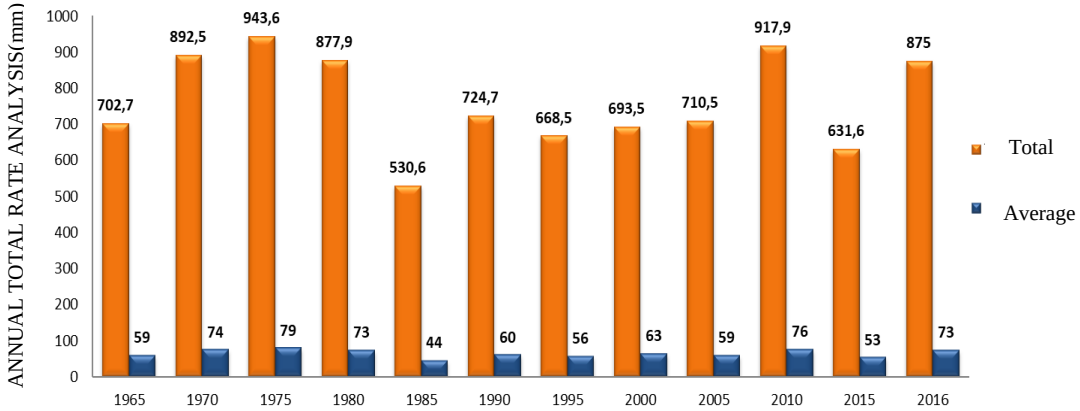


Source: www.mgm.gov.tr

Figure 2.6. Variation of the total average of rain in the Samsun province per months

- *Bafra Meteorological Station*

When the annual average rain (mm) values were examined according to the data obtained from Bafra meteorological station from 1965 to 2016, the total rain was determined to be maximum 943.6 mm in 1975.



Source: www.mgm.gov.tr

Figure 2.7. Variation of the total average of rain in the Bafra district per months

2.2.1.4. HYDROLOGICAL AND HYDROGEOLOGICAL CHARACTERISTICS

River Kızılırmak has the second biggest river basin (82.180 km^2) in our country with the alluviums it carries from the interior parts of Anatolia into the Black Sea. The average flow rate of the river between years 1962 and 2006 is 188.08 m^3/sec. The Bafra Plain that includes the Kızılırmak Delta and its close surroundings have a drainage area of 1.810,84 km^2 and consist of eight sub-basins hydrologically (Yeniyurt et al., 2008). The running streams in the delta other than River Kızılırmak are Engiz and Piliç streams on the east of the Bafra Plain and Darboğaz ve Mera streams, İlyaslı Stream and Bedeş, Gökçesu, Söğütlük, Gökçeboğaz, and Uluçay (Alaçam) streams on the west. The average flow rate of the Uluçay Stream is 2.304 m^3, where the average flow rates of the Engiz Stream and Boytar Canal are 2.317 m^3 and 6.963 m^3, respectively.

There are thirty drainage canals in total in the delta, which were built to ensure drainage of the agricultural sites at the upper altitudes. Thirteen of these (Badut, Bakırpınar, BDT1, Boytar, Çorak, Düden, Hacılar, Hızır İlyas, Karaköy, Koşuköy, Kumsalçay, Peskeller, and Üçpınar) are on the east, where seventeen (Başat, Bedeş, Doyran, Fatsalılar, Fener, Göçkün A, Göçkün B, Gökçe, Göltepe, Harız, Hasanbey, Karadere, Karayel, Muamlı, Mülk- boğazı, Paşaboğazı, and Selemağrı) are on the west. The water that returns from agricultural sites through the drainage canals on the east is collected in BDT1 and BDT2 zoning canals, and then given into the Boytar transmission canal through the pumps and discharged into the sea. An area of about 10.000 ha is drained through Koşuköy, Hacılar, Çorak, Badut, Boytar, Kuşaklama, and Bakırpınar drainage canals opened with the Bafra Plain Right Coast Irrigation Network project (Arslan, 2011).

There are seven big lakes in the Kızılırmak Delta, namely: Lake Balık (1389 ha), Lake Cernek (589 ha), Lake Liman (272 ha), Lake Gıcı (125 ha), Lake Tatlı (52 ha), Lake Uzun (293 ha), and Lake Karaboğaz (170 ha). Beside these, there are also Lake Altınlı, Lake Sülüklü, and Lake Mülk. Water level measurements have been taken in Lake Balık within the delta since 1959 (Figure 2.8.). Apart from this, changes in the water level have been measured in lakes Cernek and Karaboğaz since 2016.

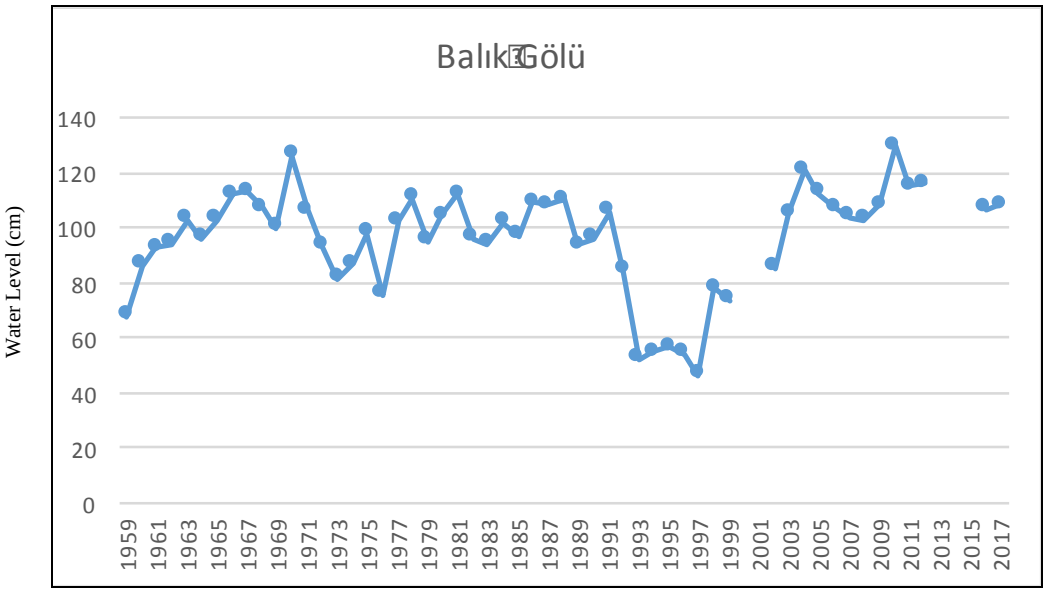


Figure 2.8. Change in the Water Level of Lake Balık

Photograph 2.1 Lake Cernek

The maps that reflect the natural structure (water sources, fault lines, fold axis, aquifer site, dams, lakes, canals, streams, creeks, landslide risk) of the area where the Natural Protected Areas of the Wetland and Bird Paradise in the Kızılırmak Delta are located in are given below within the borders of Bafra Sub Basin in Samsun Province and in its condition in the area, focused on close neighbourhoods and roads (Figure 2.9.).

NATURAL STRUCTURE MAP

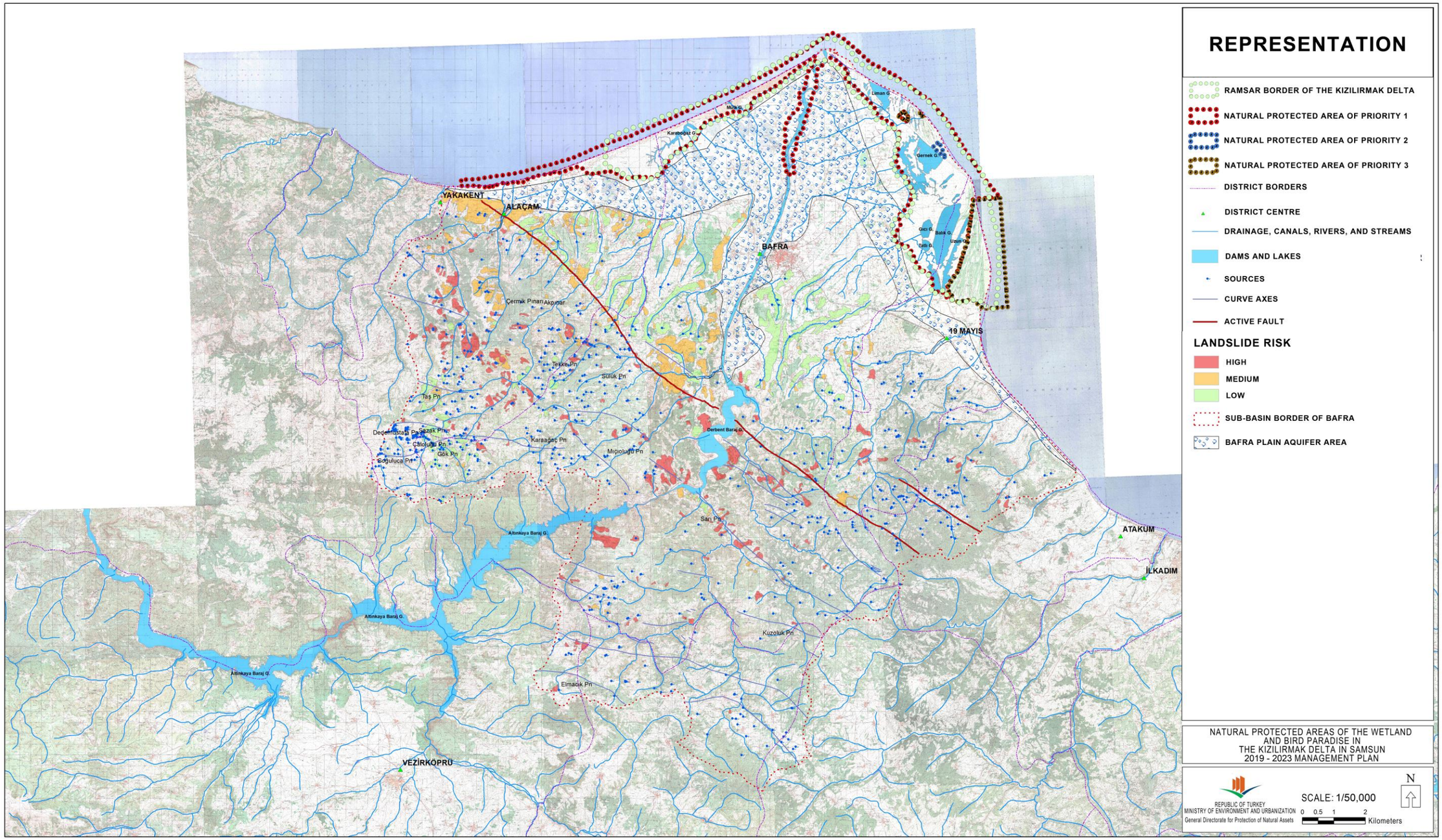


Figure 2.9. Hydrological Situation and Natural Structure within the borders of the Lower Basin of Bafra

2.2.2. BIOLOGICAL-ECOLOGICAL DATA

2.2.2.1. FLORA

The Kızılırmak Delta is considered as one of the 122 Key Botanical Sites in our country as it hosts endangered and rare plant species. 554 plant species were discovered in the area, where 2 known endemic species, namely as *Linaria corifolia* and *Galanthus rizehensis* are found in the area. But there are also not endemic but rare species. Among these species, *Rhaponticum serratuloides* (Asteraceae), *Ambrosia maritima* (Asteraceae), and *Pancratium maritimum* (Amaryllidaceae) are endangered at national level and *Jurinea kilaea* (Astaraceae), *Galanthus rizehensis* (Amaryllidaceae), *Leucojum aestivum* (Amaryllidaceae), and *Thelypteris palustris* (Thelypteridaceae) are vulnerable plant species at national level, according to the Red Book of Turkish Plants. *Rhaponticum serratuloides* is found in our country only in the Valley of River Sakarya apart from the Kızılırmak Delta. The Kızılırmak Delta is one of the three areas where the plant *Thelypteris palustris* is recorded in our country. Sea daffodil (*Pancratium maritimum*), which is "endangered" because its bulbs are picked and dunes are introduced to tourism services, despite being widespread on the coastal dunes of the Mediterranean and West Black Sea, is also among the important plant species found in the Kızılırmak Delta. Summer snowflake (*Leucojum aestivum)* that has medical importance and commercial circulation is among the important species of the Kızılırmak Delta (Yeniyurt et al., 2008; Korkmaz and Sağlam, 2010).

Photograph 2.2 Important Plant Species in the Delta

Based on these data, half of the families and one fifth of the species in our country were determined in the delta. Likewise, the Cyperaceae and Juncaceae families that prefer aquatic environment are remarkable with 24 species. The number of species directly discovered on the face of the lake is 39. 73 species were found to be species that have

an economic use (medical, food, decoration, etc.) across the country. These figures are also a clear indicator of the diversity of plants in the delta.

Summer snowflake (*Leucojum aestivum)* that has medical importance and commercial circulation is widely and densely found in the flooded parts of the delta. Species such as *Ttournefortia sibirica var. sibirica, Periploca graeca* L. *var. vestita, Schoenoplectus triqueter, Stachys maritima, Euphorbia lucida, Digitaria sabulosa* are rare species known only at a few points in our country and mostly from the dunes at the coast of Black Sea (Yeniyurt et al., 2008; Şahin, 2012).

Photograph 2.3 *Jurinea kilea* species

There are generally *Lemna* spp. ve *Potemogeton* spp. submerged and *Typha* spp. and *Phragmites australis* emerged plant species in the lakes of the delta. The site also contains salt-resistant species predominantly, namely as *Juncus littoralis*, *Salicornia europaea*, and *Atrocnemum fruticosum* (Şahin, 2012). The dominant plant species in Lake Balık are *Juncus acutus, Typha latifolia, Nymphaea alba, Hydrocharis morsus ranae, Myriophyllum verticillatum*, and *Potamogeton gramineus*, where main species in Lake Uzun are *Juncus acutus, Typha latifolia, Hydrocharis morsus ranae*, and *Myriophyllum verticillatum.* The dominant plant species in Lake Cernek were discovered as *Juncus acutus*, *Typha latifolia*, *Nymphaea alba*, *Hydrocharis morsus-ranae*, and *Myriophyllum verticillatum* (Engin, 2012). The Galeriç Forest located on the east of Lake Uzun is covered with alder (*Alnus*) and ash trees (*Fraxinus*), being a rare flooded forest in our country.

Photograph 2.4 Water and surface water plants in Lake Tatlı

Photograph 2.5 Nymphaea alba (Water lily)

Phytoplankton

Upon examination of the composition of the phytoplankton species in the lakes of the Kızılırmak Delta, 109 taxons in total were determined in Lake Liman, which belong to divisions Bacillariophyta, Chlorophyta, Cyanophyta, Dinophyta, Xantophyta, Chrysophyta, and Cryptophyta (Soylu and Gönülol, 2010a). Dominancy of Oscillatoria in particular in Lake Liman is an indicator that the lake exhibits eutrophic character (Soylu and Gönülol, 2010b). 104 taxons in total were determined in Lake Cernek, namely as Cyanobacteria (17), Bacillariophyta (24), Chlorophyta (48), Cryptophyta (1), Dinophyta (1), Euglenophyta (11), and Xanthophyta (2) (Taş and Gönülol, 2007). When Chlorococcales species considered as an indicator of eutrophication in other lakes of the delta are examined, 8 species were discovered in Lake Tatlı, 14 species in Lake Gıcı, 10 species in Lake Liman, and 29 species in Lake Cernek (Maraşlıoğlu et al., 2011). Aysel et al. 2008 carried out a study on the coast of Black Sea, including the study area, concerning sea algae and seagrass. This study determined existence and distribution of 176 taxons in total, specifically 20 taxons from blue green algae (Cyanophyceae), 106 taxons red algae (Rhodophyceae), (among these, *Gelidium pusillum* (Stackhouse) Le Jolis var. *Pusillum* is newly recorded for the area), 27 taxons from brown algae (Fucophyceae), 21 taxons from green algae (Chlorophyceae), and 2 taxons from seagrass *Tracheophyta Liliopsida*. The seagrass was identified from the upper infralittoral zone on the coast of Samsun. Beside other algae groups, seagrass is quite important for the ecological integrity and ecosystem functions (fishery, excellent habitats) of the marine wetlands and the marine extension of the Kızılırmak Delta.

2.2.2.2. FAUNA

Aquatic Organisms

Kızılırmak Delta involves a number of large and small lakes with varying salt concentrations, namely as Lake Balık, Lake Uzun, Lake Tatlı, Lake Gıcı, Lake Cernek, and Lake Liman located on the east and Lake Karaboğaz on the west of River Kızılırmak. Diversity and richness of zooplanktons vary in lakes with varying habitat characteristics (Table 2.2).

Table 2.2 Richness of zooplankton species in the lakes in the Kızılırmak Delta

Lakes	Cladocera	Copepoda	Rotifera	Source
Lake Balık	17	8	25	Emir, 1990; Gündüz, 1991a, 1991b; Saygı et al., 2011; Ustaoğlu et al., 2012
Lake Uzun	14	5	18	Ustaoğlu et al., 2012
Lake Tatlı	8	4	20	Ustaoğlu et al., 2012
Lake Gıcı	9	5	18	Ustaoğlu et al., 2012
Lake Cernek	14	3	18	Demirkalp et al., 2004; Bekleyen and Taş, 2006; Saygı et al., 2011
Lake Liman	5	2	28	Demirkalp et al., 2010; Saygı et al., 2011
Lake Karaboğaz	8	5	51	Gündüz et al., 2013

Four Ostracod species were designated in the lakes within the delta, namely as *Cypria ophthalmica* (Jurina, 1820), *Cyprideis torosa* (Jones, 1850), *Potamocypris arcuata* (Sars, 1903), and *Sarscypridopsis aculeata* (Costa, 1847) (Ustaoğlu et al., 2012).

According to the researches carried out in some lakes of the Kızılırmak Delta on Bivalvia and Gastropoda fauna which has an important place in food chain, *Theodoxus fluviatilis* (L.,1758) from Gastrapoda class was identified in Lake Balık, Lake Uzun, Lake Gıcı, Lake Cernek, and *Viviparus viviparus costae* (Mousson,1863) in Lake Gıcı and Lake Cernek, and *Radix auricularia* (L.,1758) in Lake Cernek, *Radix peregra* (Müller,1774) in Lake Balık, Lake Uzun, Lake Gıcı, and Lake Cernek, and *Physa acuta* (Draparnaud,1805) in Lake Cernek, and *Physa fontinalis* (L.,1817) in Lake Cernek. *Unio pictorum* L., 1758 (Figure 7) from Bivalvia class was identified in Lake Balık, Lake Uzun, and *Anodonta cygnea* (L.,1758) in Lake Balık, Lake Uzun (Öktener, 2004).

In addition, *Hirudo medicinalis* (medicinal leech), which is under Near Threatened (NT) category according to the IUCN category, was identified in Lake Balık and Lake Uzun among the lakes in the delta (Akbulut et al., 2012). The name of this species was changed as *Hirudo verbena* according to the latest zoological taxonomy.

Inland Water Fish

The Kızılırmak Delta hosts a number of fish species. 35 fish species were identified in the delta, which belong to 11 families. According to the IUCN category, *Acipenser gueldenstaedtii, Acipenser nudiventris, Acipenser stellatur, Acipenser sturio, Huso huso*, *Anguilla anguilla* (eel) and *Aphanius danfordii* are in the critically endangered (CR) status at global level, *Alosa immaculata* (shad), *Barbus tauricus escherichi* (barbel), and *Cyprinus carpio* (carp) are fish species in vulnerable (VU) status. The *Aphanius danfordii* (sailton pupfish) is also an endemic species found in the delta, which is available in the vicinity of Central Anatolia and Bafra.

River Kızılırmak is one of the most important streams in our country for sturgeon fish (Acipenseridae). Intensively hunted between years 1940 and 1970 in the Kızılırmak Basin, where a gain of upto 150 tons was obtained in some years, the sturgeon fish, *Huso huso* in particular, have started to reduce in number in early 1980's due to over-hunting, pollution, and the dams built over the river (Çelikkale et al, 2004; Ustaoğlu and Okumuş, 2004), and has arrived to a point of almost being extinct today (Zengin et al., 2008).

Amphibians (Amphibia) and Reptilians (Reptilia)

There are 165 species in total in our country. 12 amphibian species and 13 reptilian species were identified in the delta (Karataş et al., 2007; ÇŞB, 2016). The distribution of reptilians may range from the bottom of deciduous forests and bushes to dry rocks and from the wet grounds on the banks of streams to the meadow in steppes over the forest layer in the delta (Yeniyurt et al., 2008).

Out of the 12 amphibian species in the Kızılırmak Delta, 3 of them are salamanders and 9 are frogs, among which the Northern Banded Newt (*Ommatotriton ophryticus*) is in "Near Threatened" (NT) status and has a priority of protection. Out of 13 reptilians in the area, 2 are turtle species, 6 are lizard species, and 5 are snake species. The common tortoise, which is "vulnerable" (VU) at global level, is a reptilian species under protection with priority (Karataş et al., 2007). The amphibian species found in the Kızılırmak Delta are listed in study file 3, where reptilian species are listed in study file 4.

Birds

483 bird species have been identified in Turkey till date, where 355 bird species have been observed in the Kızılırmak Delta up to date, which corresponds to about 76% of the birds in Turkey. This is the highest number which has been identified in an area till date. The Kızılırmak Delta has the Important Bird Area (IBA) status, where some of these species may be observed only in winter, some only during the season of migration, some only during the breeding season, and some only rarely.

Photograph 2.6 *Alcedo atthis* (Kingfisher)

There are approximately 937 bird species in the Palearctic Realm, which lays along on the west of the Ural Mountains and involves Middle East and Northern Africa. When compared, the Kızılırmak Delta involves approximately 40% of the bird species of the Palearctic Realm.

1 of the 355 bird species identified in the delta (*Vanellus gregarius*) is in "Critically Endangered – CR" status, 4 (*Neophron percnopterus, Oxyura leucocephala, Aquila nipalensis, Falco cherrug*) are in "Endangered – EN" status, 13 (*Podiceps auritus, Puffinus yelkouan, Pelecanus crispus, Anser erythropus, Branta ruficollis, Marmaronetta angustirostris, Aythya ferina, Melanitta fusca, Clanga clanga, Aquila heliaca, Otis tarda, Streptopelia turtur, Acrocephalus paludicola*) are in "Vulnerable – VU" status, 19 (*Aythya nyroca, Somateria mollissima, Milvus milvus, Aegypius monachus, Circus macrourus, Falco vespertinus, Tetrax tetrax, Glareola nordmanni, Haematopus ostralegus, Vanellus vanellus, Calidris canutus, Calidris ferruginea, Gallinago media, Limosa limosa, Limosa lapponica, Numenius arquata, Larus armenicus, Anthus pratensis, Emberiza cineracea*) are in "Near Threatened – NT" status, 37 bird species in total have priority in protection.

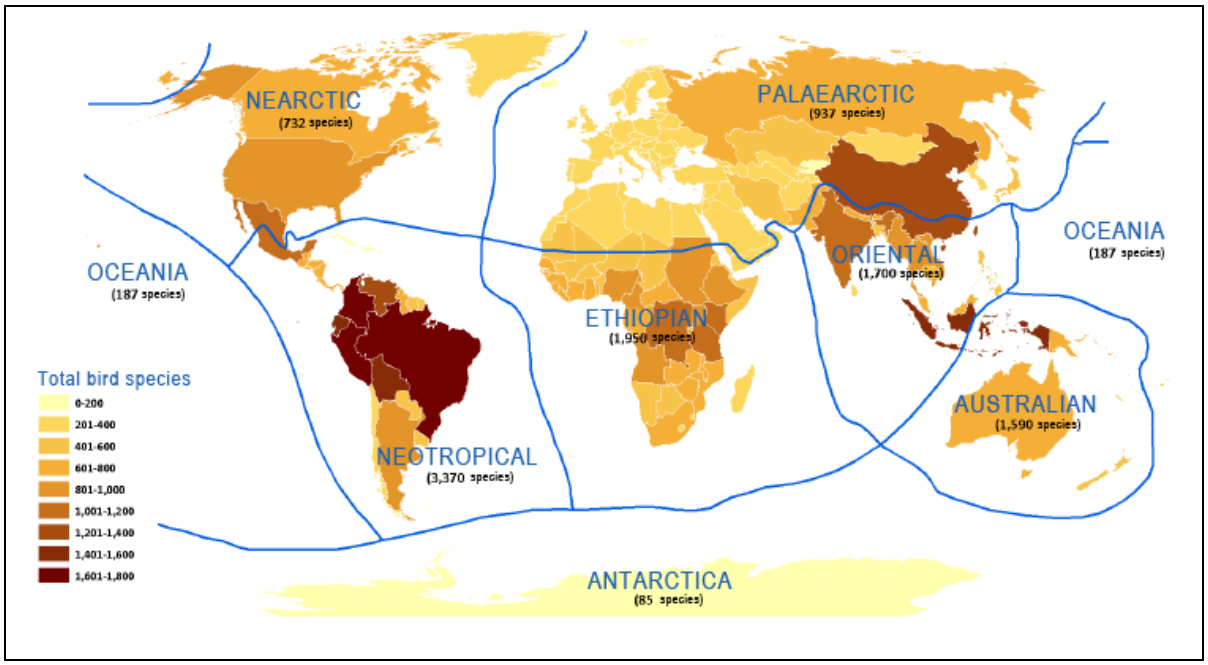


Figure 2.10. Number of bird species determined in zoo-geographical regions

Photograph 2.7 *Merops apiaster* (Bee-eater)

The delta is of great importance also for the continuation of the long journeys of migratory birds, beside hosting rare or endangered bird species. The delta has a special place as regards to the bird species and population identified in the area it stands for (West Palaearctic Region). Thanks to the temperate climate conditions, rich food

source, and sheltered fields, the delta is preferred by crowded waterfowls in winter. A considerable amount of pygmy cormorants (*Phalacrocorax pygmeus,* maximum 420), little egrets *(Egretta garzetta,* maximum 3200), glossy ibis (*Plegadis falcinellus,* maximum 1700), white-headed duck (*Oxyura leucocephala,* maximum 1246), little gull (*Larus minutus,* maximum 41.000), and white-winged tern (*Chlidonias leucopterus,* maximum 3000) may be observed during migration in the area. In addition, more than 10.000 seacoast birds migrate over the delta (Yarar and Magnin, 1997).

Photograph 2.8 *Podiceps cristatus* (Great crested grebe)

Approximately 100.000-150.000 waterfowls take shelter in the delta during winter. The study carried out in 1992 determined that 140 bird species incubated throughout the delta, about 88 being definite (Hustings and van Dijk 1994). According to up-to-date data, 157 bird species breed in the area. Important bird species that breed in the area are bittern (*Botaurus stellaris*), purple heron (*Ardea pupurea*), black stork (*Ciconia nigra*), spoonbill (*Platalea leucorodia*), gadwall (*Anas strepera*), garganey (*Anas querquedula*), red crested pochard (*Netta rufina*), common pochard (*Aythya ferina*), ferruginous duck (*Aythya nyoca*), lesser spotted eagle (*Aquila pomarina*), crane (*Grus grus*), purple swamphen (*Porphyrio porphyrio*), black-winged stilt (*Himantopus himantopus*), Eurasian stone curlew (*Burhinus oedicnemus*), collared pratincole (*Glareola pratincola*), barred warbler (*Sylvia nisoria*).

The delta, which provides shelter, breeding and feeding area for many waterfowl species, fulfils one of the RAMSAR criteria with some waterfowl species having 1% of the world population.

Photograph 2.9 *Porphyrio porphyrio* (Purple swamphen)

Photograph 2.10 *Himantopus himantopus* (Black-winged stilt)

Photograph 2.11 *Ciconia nigra* (Black Stork)

The Kızılırmak Delta is one of the few areas in our country where storks breed as a colony. There are woods in parcels at various sections of the area where heron species and storks form mixed colonies. In these woods in parcels, grey heron (*Ardea cinerea*), little egret (*Egretta garzetta*), black-crowned night heron (*Nycticorax nycticorax*), squacco heron (*Ardeola ralloides*), cattle egret (*Bubulcus ibis*), and stork (*Ciconia ciconia*) species breed together. Galeriç Forest and the forest area in the vicinity of Yörükler and Sarıköy are important breeding areas for herons in our country.

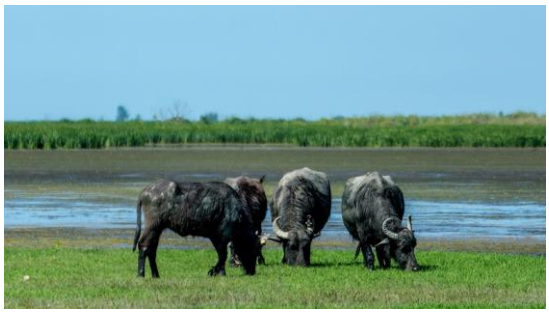
Photograph 2.12 *Egretta garzetta* (little egret)

Mammals (Mammalia)

There are over 160 mammal species in our country and 42 mammal species in the Kızılırmak Delta. It hosts 25% of mammal species in Turkey. Long-fingered bat *(Myotis capaccinii),* which is “Vulnerable” at global level, is another resident of the area. The area also hosts *Mesocricetus brandti* (Turkish hamster) and *Lutra lutra* (sea otter), species that are near-threatened (NT) at global level (Karataş et al., 2007).

Free-range jades and water buffalo herds in the Kızılırmak Delta are among the symbols of the area. Water buffaloes are set free by their owners during summer and are gathered back in winter. The mammal species available in the Kızılırmak Delta are given in study file 6.

Photograph 2.13 Water Buffalo and Jade (Samkuş)



Photograph 2.14 Existence of Water Buffaloes in the Delta (Samkuş)

Photograph 2.15 *Lepus europaeu* (European Hare)

Photograph 2.16 Existence of Jades in the Delta

2.2.2.3. ECOLOGICAL DATA

Different habitat types were formed over time with coexistence of alluvial soil – river – sea – forest ecosystems. The main habitats in this complex are forests (flooded forest, flooded bush and broad-leaved), lakes and aquatic habitats, marshes and meadows, dunes, transitory habitats, and agricultural sites (wwf 2008; Şahin, 2012).

Photograph 2.17 Flooded Forest

Dunal habitats are listed as coastal dune, semi-coastal dune, constant dune, and dune hills. Aquatic habitats are listed as plants that swim in water on the face of the lake, plants on the lakeside with roots tied to earth, within and at the side of water, and plants settled out of the face of the lake. Meadow habitats are observed as salt marshes, salt meadows, flooded meadows, and semi-wet meadows. Forests are found as flooded forest, broad-leaved forest, and flooded bushes. Areas that have lost their naturalness under human impact may be listed as roadside habitats, segetal habitats in fields, and ruderal habitats in spoilt soils (Vural et al., 2007; Şahin, 2012). Considered under EUNIS habitat classes, there are 9 different habitat types in the Wetland and Bird Paradise of the Kızılırmak Delta (Table 2.3.).

Table 2.3 EUNIS Habitat Types in the Natural Protected Areas of The Kızılırmak Delta (Source: ETBAR, 2016)

Habitat Code	Description of Habitat	Area	Rate (%)
B1.4	Constant Coastal Dunes with Grass	8775,89	37,07
B1.6	Coastal Dune Bushes	796,66	3,37
C1.2	Permanent Mesotrophic Lakes and Ponds	2495,71	10,54
D5.2	Wide Reed Beds	351,03	1,48
D5.3.	*Juncus* Marshes	6210,8	26,23
E3.4	Humid or Wet Eutrophic and Mesotrophic Meadows	792,45	3,35
G1.5	Flooded Forests	1291,07	5,45
G1.7	Thermophilic Deciduous Forests	346,15	1,46
I1.2	Mixed Market Gardens and Agricultural Sites	2614,12	11,04

B1.4 Constant Coastal Dunes with Grass

A plant community, among which *Ammophila arenaria, Bolboschoenus maritimus, Achillea maritima, Euphorbia paralias, Elymus elongatus* are dominant, grows in coastal dunes closest to the sea. Semi-coastal dunes are respectively in fixed situation just in the interior part of the coastal dune, where there is more plant diversity. Here, species such as *Elymus farctus, Eryngium maritimum, Cyperus capitatus, Pancratium maritimum, Medicago marina, Erodium cicutarium, Pseudorlaya pumila, Salsola kali* are found prevalently.

Dunal hills: Dunal hills, which develop particularly on the west side of the delta, on a place far from the coast, are covered with bushes such as *Paliurus spina-christi, Hippophae rhamnoides, Crataegus monogyna, Cynanchum acutum, Dactylis glomerata, Apera intermedia, Glycyrrhisa glabra, Jurinea kilea, Lolium perenne, Ligusrtum vulgare, Myricaria germanica, Osyris alba* and herbaceous species mostly comprising of poaceae. These bushes are either scarce or thick as not possible to step in, with a height of 2-3 metres. Density of herbaceous species in the bushes vary.

Juniper Community: On the dunal hills, along with the broad-leaved bushes, there is *Juniperus oxycedrus subsp. macrocarpa* bush on the west edge of the delta, known as

prickly juniper and found on the Mediterranean and Aegean coasts of our country. This juniper species live on the coastal dunes in the form of a bush or short tree. Well-protected ones were observed to reach upto 2-4 metres in height in the delta. Other species of this bush that exist in a small area are bushes and herbaceous species similar to the ones on dunal hills. However, it was seen that coastal pines were planted here as well as on the west part of the delta and impaired integrity of the habitat. This juniper bush is quite important for the delta, as it is the only coniferous coastal bush known in the Black Sea region in our country.

Photograph 2.18 Coastal dunes

B1.6 Coastal Dune Bushes

Vegetation with psammophitic (dunal) characteristics developed on the coastal dunes with a width of about 250-300 m from the seaside. The dunes on the west side are higher and wider than the dunes on the east side of the delta. The part where the east side dunes are the widest is the vicinity of Lake Cernek. It consists of plane areas without dunal mobility. It is particularly well-developed in the part between Lake Cernek and sea. This is the dunal section with the highest diversity of species, where vegetation mostly comprises of scarcely distributed annual or short-lived perennial species. Species such as *Cionura erecta, Maresia nana, Verbascum sinuatum, Tribulus terrestris, Teucrium polium, Sophora alopecuroides, Silene dichotoma, Polipogon monspeliensis, Parentucellia viscosa, Leymus racemosus, Cakile maritima, Asparagus officinalis, Bromus tectorum, Salsola ruthenica, Corispermum filifolius* are widespread here. The ground of these bushes that lay in parallel on the constant dunal planes between Lake Cernek and the sea is always covered with water. *Laurus nobilis* is the dominant shrub species here. Clutching bushes over these shrubs, such as *Clematis*

vitalba, Smilax excelsa, Periploca graeca form a dense cover. That's why it is not possible to get through these bushes. Content of species is respectively weak.

C1.2 Permanent Mesotrophic Lakes and Ponds

- Bitter lake face

Upon evaluation made according to the rates of saltiness, lakes Balık, Uzun, Cernek, Liman, Karaboğaz, and Mülk were classified as bitter lakes.

- Freshwater lake face

Lakes Tatlı and Gıcı are freshwater lakes. The lakes accommodate plant communities that consist of floating species such as Lemna minor ad Lemna gibba, *Myriophyllum spicatum*, *Ceratophyllum submersum*, *C. demersum, Potamogeton* species, species that grow in water with roots tied to earth, such as *Nympha alba* ve *Nuphar lutea*, and aquatic species with roots tied to earth, such as *Najas minor*. Especially the leaves of Potamogeton species spread over water and cover the surfaces of lakes. *Nympha* and *Nuphar* species form populated communities so as to entirely cover the surface of water at near-coastal points with less depth of water.

- River

The bed of River Kızılırmak contains river bushes and trees such as *Salix* spp, *Populus alba*, and *Tamarix symirnensis*, which are irregularly positioned in the vicinity.

D5.2. Wide Reed Beds

As a habitat that extends to a wide space on the northern parts of Lake Cernek in the delta, reeds and canes form high-length communities with roots mostly tied to the earth within water and trunks around and on the coast of the lake. Communities of *Phragmites australis*, *Typha angustifolia, Typha domingensis, Cladium mariscus, Schoenoplectus lacustris, Schoenoplectus triqueter, Sparganium erectum, Cyperus longus, Butomus umbellatus* are observed on the coast of the lake in a pure or mixed form. These communities line up from land towards lakes, depending on the depth of water and length of plants.

D5.3. Juncus Marshes

For the most time in a year, narrow-leaved reedmace such as *Juncus acutus*, *J. littoralis*, *J. maritimus* form crowded communities in waterlogged and highly salted high parts. Diversity of species is low in these reeds that look like a marsh and salt-resistant species are placed among narrow-leaved reedmace. However, as herbaceous species such as *Spergularia marina, Aster tripolium, Bellis perennis* are damaged as bovine animals spend much time in these marshes, they try to hold tight by surrounding the groups of narrow-leaved reedmace in a circular way.

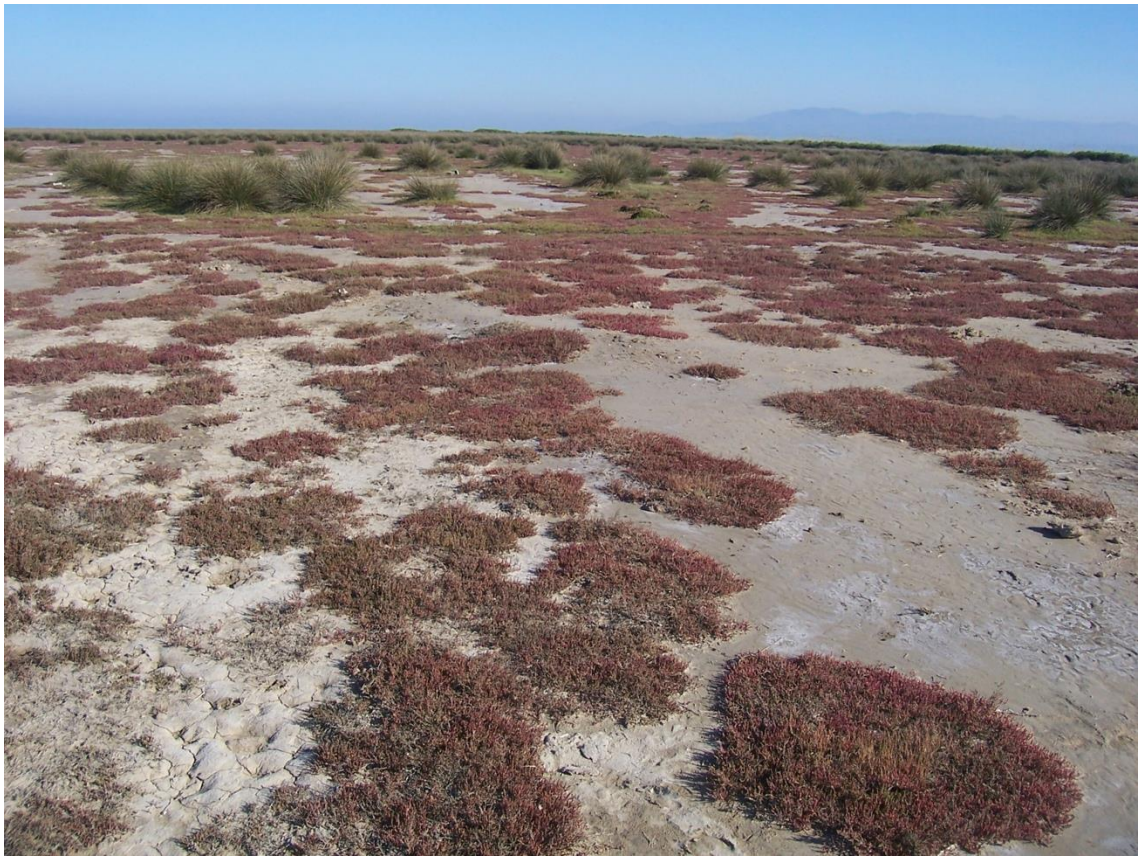
E3.4. Humid or Wet Eutrophic and Mesotrophic Meadows

Any field other than the surface of the lake, dunes, and forests contain this type of meadows and marshes. Here, the depth of the ground water in the earth and saltiness are the most important factors. These areas consist of soil with high amount of organic substances and humus, as they are located in interior land far from the sea. Therefore, they are suitable for grazing.

Whereas almost only the *Paspalum paspalodes* species grows on the *Paspalum paspalodes* meadows, which grows in the earth waterlogged throughout the year, that is close to lakes, plant species that grow in lakes and salt marshes are also found on the side parts. As they are popular for grazing, these fields are quite important both for wildlife and feeding of water buffaloes and other bovine and ovine animals that graze in the delta.

Grazing is intensive in mesophytic meadows, which are located far from the lakes and the ground water as the ground level is 10-20 cm higher and where herbaceous species such as *Cynodon dactylon*, *Poa pratensis*, *Taraxacum* sp., *Plantago lanceolata, Lotus corniculatus, Centaurium erythrea, Eryngium creticum* are mostly available. In sections of meadows where saltiness increases, tall herbaceous plants such as *Artemisia santonicum* with woody roots are encountered more. The floristic and physiognomic structure of these meadows looks like the plain meadows in Anatolia with a river located in the vicinity.

The sections where the saltiness in the soil is the highest are called as salt pans, where actual halophytes grow in, such as *Salicornia europaea, Suaeda prostrata, Salicornia prostrate*, and *Hordeum geniculatum*. As halophytes are not preferred much by the animals, they relatively grow well but form small areas in terms of area scale.



Photograph 2.19 Salt marshes

G1.5. Mixed broad-leaved flooded forests

This type of forests consist of seasonal flooded tree communities, where *Fraxinus angustifolia* is dominant and densely involve types of trees and clutching bushes such as *Frangula alnus*, *Quercus robur*, *Smilax excelsa, Pyrus communis, Periploca graeca, Rubus sanctus, Pterocarya fraxinifolia*. Where the largest community is the Galeriç Forest located on the east side of the delta, the west side is also occupied with rather reduced communities around Lake Karaboğaz. The forest consists of trees in 10-20 m of height. These forests are flooded in spring and winter in particular. The herbaceous species found widespread under this type of forests are *Leucojum aestivum*, *Orchis laxiflora*, *Lysimachia nummularia*, and *Oenanthe fistulosa*. *Alnus glutinosa* (L.) Gaertner subsp*. glutinosa* (Betulaceae) (alder) communities lay along the delta quite rarely, in narrow spaces and in fragments. They grow in places where ground water level is relatively lower and a bit further from the lakes.

G1.7. Mixed broad-leaved forests

It is a forest vegetation which contains *Carpinus betulus* L. and *Quercus robur* L. subsp. r*obur* in a mixed form. The herbaceous species which are densely found under these forests, namely as *Primula vulgaris* subsp. *sibthorpii*, *Cyclamen coum* var. *coum*, *Arum maculatum*, *Viola sieheana*, and *Ranunculus ficaria* subsp. *bulbifera* are placed locally and in fragments.

I1.2. Mixed Market Gardens and Agricultural Sites

In general, cereals and rice are produced in agricultural sites. The agricultural sites in the delta extend over an area of about 11%. They are transitory and artefactual habitats with an irregular distribution across the delta, such as roadsides, fields (temporary communities of invasive species grown in agricultural sites) and around watering canals. The species in these habitats are thorn species such as *Cirsium, Carduus, Cynara, Xanthium, Centaurea iberica, Eryngium creticum* and cosmopolitan herbaceous species such as *Anthemis tinctoria, Capsella bursa-pastoris, Trifolium spp., Medicago minima, Papaver rheoas, Bromus tectorum*, which have well-adapted to areas with lost naturalness.

2.2.3. WATER QUALITY

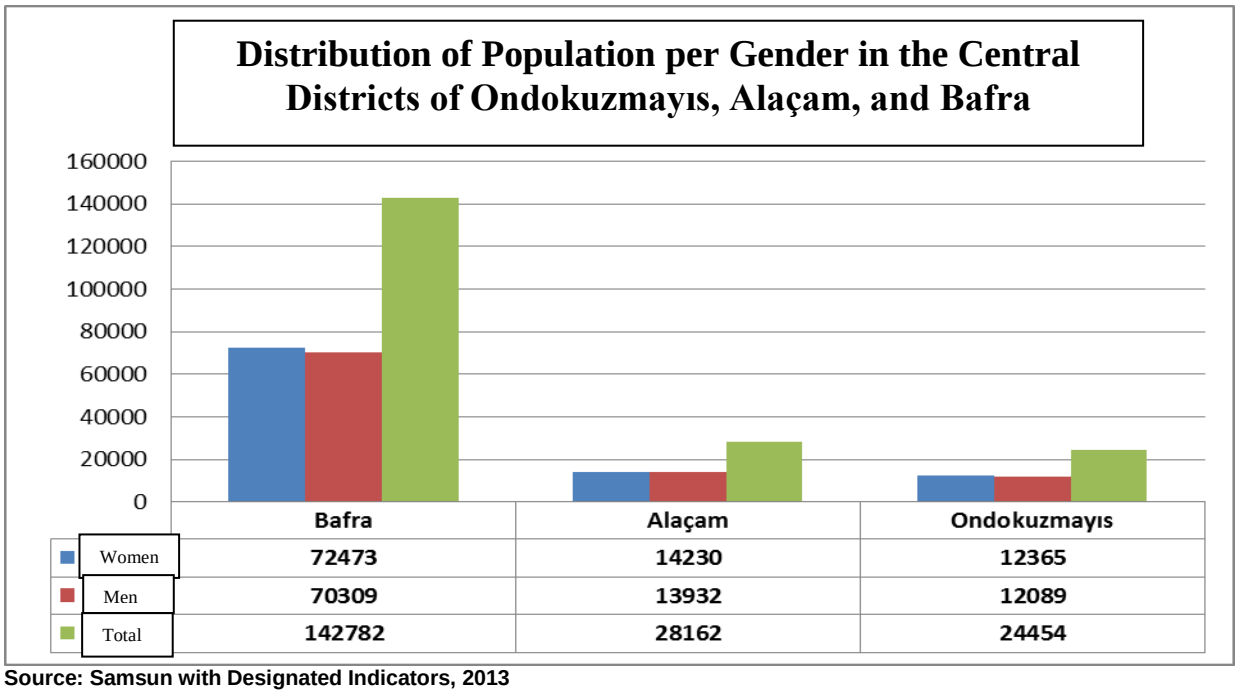
The seasonal change of the chemical properties of the water in the drainage canals in the Right Coastal Irrigation Area of the Bafra Plain was examined through the analyses of EC, pH, Na, Ca, K, Mg, CO3, HCO3, and Cl and calculation Sodium Adsorption Rate (SAR) and Residual Sodium Carbonate Concentration (RSC) values in the water samples taken in monthly periods from the 7 drainage canals in the plain from May 2005 to April 2006. As a result of the study, it was found out that the saltiness value of the water in the drainage canals lessened with the mixing of water from irrigation network in summer. However, an increase was identified with the saltiness values of the drainage canals with the termination of irrigation and start of winter rains. The high saltiness value of drainage water during winter showed that the salt in the land was washed away with rains in winter and passed to drainage canals. The water within the drainage canals was found to be generally with high salt – low sodium (C3S1) during summer, whereas with very high salt – low sodium (C4S1) and very high salt – medium sodium (C4S2) during winter. Ground water saltiness found out to be higher on the east side of the study area, which is closer to the Black Sea, also shows penetration of salt from the Black Sea to the delta area through surface and underground water.

Because of the characteristics of the delta and the elevation and topography in the delta (very low inclination, planeness), permeability of water of the soil and dunes, and connection of the wetlands in a lagoon character with the sea, intervention by the sea would be inevitable depending on the time and place. Arslan and Demir (2011) carried out studies about the impact of the intervention of sea water in Bafra Plain on the quality of the underground water. For this purpose, 32 underground water wells were identified, which were in use for irrigation by the farmers in the plain, and water samples were taken from these wells before and after the irrigation season, and these samples were analyzed for EC, pH, Na, Ca, K, Mg, CO_3, HCO_3, Cl, and SO_4. CI values were used to determine the mixture ratio of the sea water into the underground water, and thus the correlation was found out between the extent of the sea water intervention and the quality parameters of the underground water with the intervention of sea water. It was

determined that there was intervention of sea water into the underground water in coastal areas of the Bafra Plain, where such intervention by sea water impacted the quality parameters of the underground water. It was also found out that the EC and SAR values of the underground water extremely increased with the increase of the intervention of sea water and these values would not allow the use of such water for the irrigation of the plants. Due to the geomorphological characteristics of the Kızılırmak Delta (suitable aquifers), existence of the underground water and high level of the ground water come out as a very important element of the water quality. The existing high ground water leaving its salt through capillarity and evaporation, conveyance of this salt to water sources through agricultural irrigation and surface flows, underground water (especially underground water with high salt) being drawn and put into hydrologic cycle causes a permanent concern and threat over the water quality, first in agricultural sites and then in wetlands.

2.3 SOCIO-ECONOMIC DEMOGRAPHIC STRUCTURE

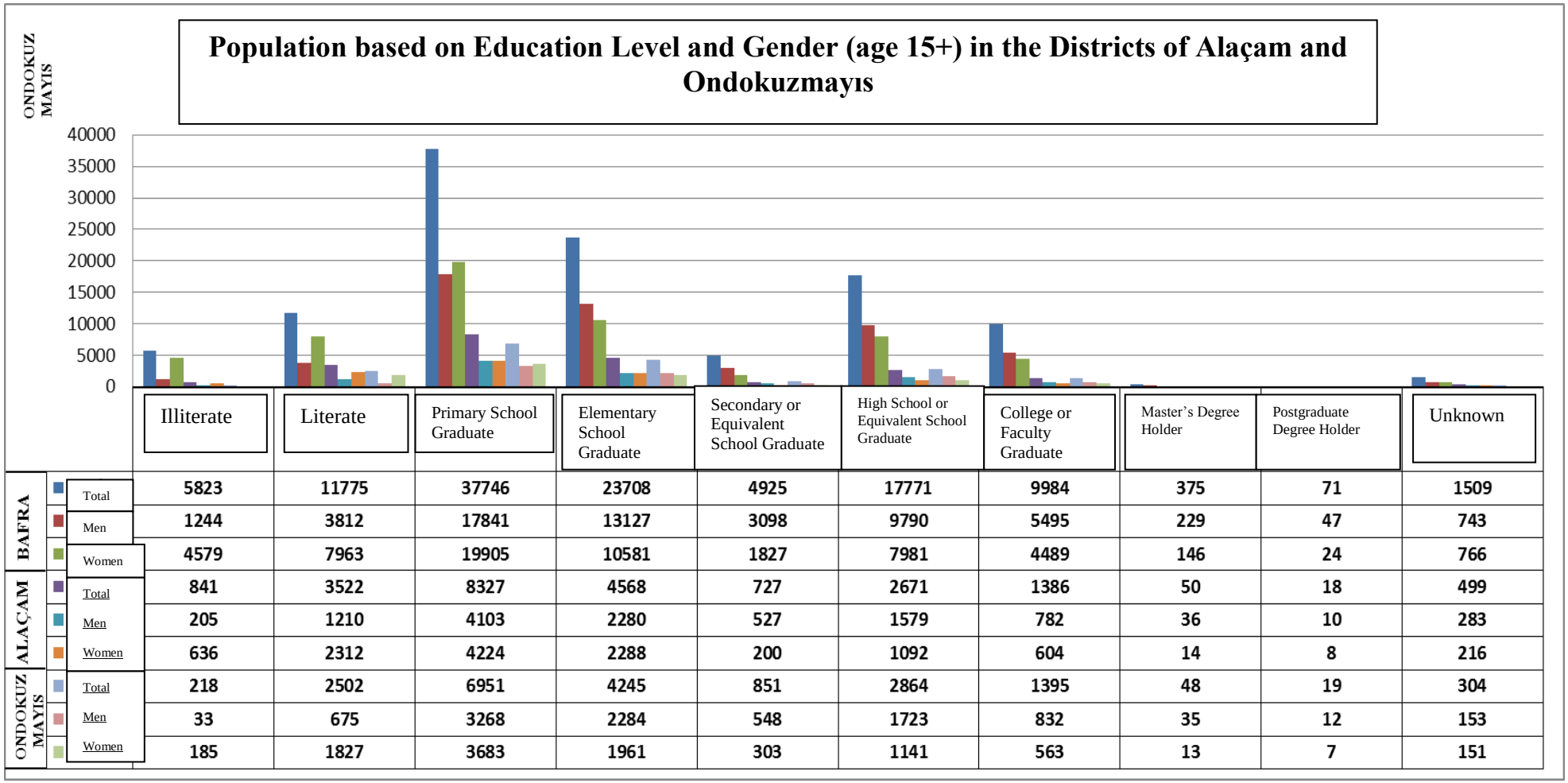
When examined in terms of demographic, economic and social structure, Ondokuzmayıs, Alaçam, and Bafra districts within Samsun Province, where the Kızılırmak Delta is located in, the total population of these districts as of the end of 2014 is 195.428, according to the data from the Address-Based Population Registration System (ABPRS), 96.330 of which are men (49.3%) and 99.098 of which are women (50.7 %) (Turkish Statistical Institute (TÜİK), Results of the address-based population registration system, 2013) (Figure 2.11.).



Source: Samsun with Designated Indicators, 2013

Figure 2.11. Rate of Population per gender in the central districts of Ondokuzmayıs, Alaçam, and Bafra

As to the education level in Bafra, Alaçam, and Ondokuzmayıs districts, the maximum ratio of graduation is from primary school, where high education ratio is quite low. The rate of men was determined to increase with the increase of the level of education.



		Illiterate	Literate	Primary School Graduate	Elementary School Graduate	Secondary or Equivalent School Graduate	High School or Equivalent School Graduate	College or Faculty Graduate	Master's Degree Holder	Postgraduate Degree Holder	Unknown
BAFRA	Total	5823	11775	37746	23708	4925	17771	9984	375	71	1509
	Men	1244	3812	17841	13127	3098	9790	5495	229	47	743
	Women	4579	7963	19905	10581	1827	7981	4489	146	24	766
ALAÇAM	Total	841	3522	8327	4568	727	2671	1386	50	18	499
	Men	205	1210	4103	2280	527	1579	782	36	10	283
	Women	636	2312	4224	2288	200	1092	604	14	8	216
ONDOKUZ MAYIS	Total	218	2502	6951	4245	851	2864	1395	48	19	304
	Men	33	675	3268	2284	548	1723	832	35	12	153
	Women	185	1827	3683	1961	303	1141	563	13	7	151

Source: Samsun with Designated Indicators, 2013

Figure 2.12. Population based on education level and gender (age 15+) in the districts of Bafra, Alaçam, and Ondokuzmayıs

Almost 50 % of the district population live in rural area despite the efforts of development and industrialization in recent years. Majority of the total employment is in agriculture and stock raising sector. With the urban population mostly engaged in the agricultural sector, the prevalence of agricultural production within total production is remained.

The size of the lands cultivated by farmer families is generally limited to the size of a family-run business, which is 1-50 decares in average. The number of farmers who own a land of that scale constitutes 90% of the total number of families. The amount of lands owned by these persons is 65% of the total agricultural site.

The main means of living of the people who live around the wetland in the Kızılırmak Delta are activities such as agriculture, stock raising, fishery, and reed harvesting. There is 1 dairy products processing facility in the district with a dairy processing capacity of 10 tons. The Kızılırmak Delta is one of the most important agricultural sites of Turkey where vegetables are cultivated intensively. Mostly rice and grains are produced around the wetland in the delta.

2.4 NATURAL AND CULTURAL DATA

2.4.1 TRADITIONAL MEANS OF USE

Traditional means of use provide the folks of the region get socialized in a way special to their conventions and have similar characteristic properties similar to each other (www.samsunkulturturizm.gov.tr). The traditional means of use in the Wetland and Bird Paradise in the Kızılırmak Delta are water buffalo raising, reed harvesting, rush harvesting, fishery, and leech picking. Especially in terms of water buffalo raising, the highest number of water buffaloes in our country lives in the delta. When the numbers of water buffaloes in Bafra, Ondokuzmayıs, and Alaçam districts are compared, water buffalo raising activities are the highest in Bafra district.

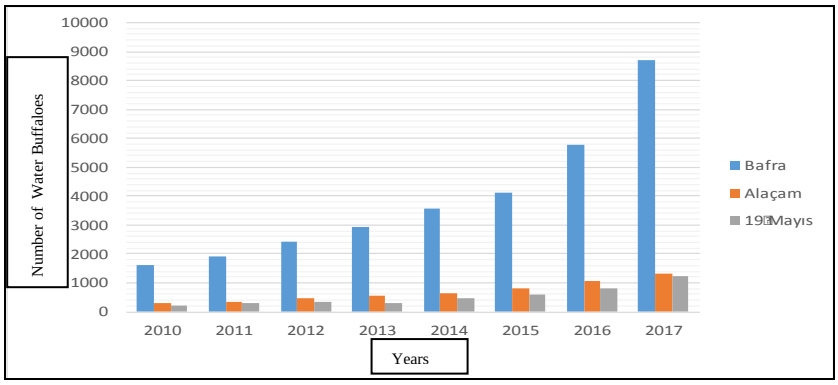


Figure 2.13. Number of water buffaloes in the districts within the borders of the Wetland and Bird Paradise of the Kızılırmak Delta

Water buffaloes are an important element of the wetland ecosystem for the living of the pasture vegetation, lake sedimentation, birds, and fish. The existence of the water buffaloes in the delta is highly important for controlling expansion of many wetland plants, for the refreshment of reeds, and for the bird species to make nest in reeds and marshes (creating sheltered areas). In addition, water buffalo's milk is a valuable food source with its high oil, protein, and vitamin content.

Fishing is a traditional activity of the local people of the Kızılırmak Delta thanks to the existence of water bodies such as Tatlısu (Lake Tatlı, Lake Gıcı), the lagoon having the fresh water character with a connection to the sea (Cernek, Liman, Balık, Uzungöl), which form a complex of delta. It is quite important both because the wetlands are part of the ecological structure and fishing activities in the area that have been going on for many years, as the concrete model of the relation between man and ecosystem (for details see 2.6.2 Fishery).

The medicinal leech (*Hirudo* sp.), picking of which was restricted by CITES, is one of the most characteristic species of the habitat. Medicinal purpose leech has been picked in the delta since 1992. They are forbidden to be hunted and picked between 1st March and 30th June, according to the Communiqué on Aquaculture Products of the Ministry of Food, Agriculture, and Livestock.

2.4.2. CULTURAL HERITAGE AND ARCHAEOLOGICAL EVALUATIONS

Located within the borders of Ondokuzmayıs, Bafra, and Alaçam districts in Samsun Province, where River Kızılırmak runs into the Black Sea, the application file of the Kızılırmak Delta is at preparation phase for being enlisted in UNESCO's World Heritage List in 2018, where researches for the Intangible Cultural Heritage of the area have importance in this aspect, as well. The delta is a natural area having importance at international level for representing the types of habitats specific to the Black Sea, continuing ecological and genetic diversity, and providing accommodation to numerous species through various living environments. For the protection of this natural heritage with correct methods, and for raising awareness about importance and necessity of protection, and inheriting the area in its original condition to next coming generations, the practices, narrations, knowledge, and skills of the local people of this area should be protected as well. In this aspect, any effort for protecting the cultural heritage of the area along with the natural heritage is very important for the sustainability of protection.

The aim of the "Project for Determining the Intangible Cultural Heritage in the Impact Area of Wetland and Bird Paradise in the Kızılırmak Delta within Framework of the UNESCO Process" carried out in the Kızılırmak Delta within the borders of the Ondokuzmayıs, Bafra, and Alaçam districts of Samsun Province with cooperation of Turkish Ethnology Research and Implementation Center in Gazi University and Samsun

Metropolitan Municipality and with the contribution and support of UNESCO Turkish National Commission, UNESCO UNITWIN Intangible Cultural Heritage Chair in Gazi University, and Intangible Cultural Heritage Institute Foundation is to reveal the intangible cultural heritage of this area. The project is aimed to support diversification of the tourism infrastructure and activities of the Kızılırmak Delta, revival of the same at national and international level, and promotion of the tourism potential. In addition, the spaces and themes of exhibition will be specified for the Intangible Cultural Heritage Museum planned to be established in the Bird Paradise in Ondokuzmayıs district with this project. According to the outputs of the project, suggestions and implementation models will be developed for the information of visitors and for training purposes, particularly for children, youth, and disadvantaged groups as regards to the management of the museum. According to its consequences, a multi-dimensioned protection shall be provided for the Kızılırmak Delta with this project and contribution shall be made to new studies regarding this area.

Ondokuzmayıs, Bafra, and Alaçam districts and their villages were visited and about 396 source persons were interviewed during the mentioned project. With these interviews, oral culture products such as fairy tales, sagas, and stories within field of intangible cultural heritage area; performance arts such as art of troubadours, village plays, karagöz (shadow play), and meddah (public storyteller); social practices, rituals, and festivals such as birth, marriage, death, and Hıdırellez; practices concerning nature and universe such as folk medicine, public kitchen, and public architecture, and all traditional professions learned on master-apprentice relationship and not based on serial production, that is the handcrafts tradition were compiled. In addition, each researcher and compiler kept a journal of the area and area notes were deciphered every day for keeping log of all information. A visual, aural, and written archive was formed with the obtained data, which was classified under five titles of intangible cultural heritage, and a catalog was prepared upon a thorough study.

There is not any archaeological value within the borders of the delta. However, there are Amisos Antique City and Rock Graves within the borders of Samsun province, the Archaeological Protected Area in Asarköyü and Kapukaya villages, Dündartepe Tumulus (Öksürüktepe), Toptepe Tumuluses, Baruthane Tumuluses, the Castle of Akalan, Tekkeköy Caves, Kaledoruğu Tumulus, İkiztepe, Asarkale, and Rock Graves (Yeniyurt et al. 2008; Tan 2013).

2.4.3. MARINE SITES

There are a number of natural lakes and ponds for drinking water purpose and dams within the borders of Samsun province. The biggest bodies of water in Bafra neighbourhood are the parts of Altınkaya and Derbent dam reservoirs that remain within the area (Edinsel, 2012).

Coastal set lakes run parallel along the seaside on both sides of the Kızılırmak Delta. These lakes are namely Lake Balık, Lake Cernek, Lake Uzun, Lake Liman, Lake Gıcı, Lake Tatlı, and Lake Karaboğaz. A number of small and transitory water basins among these lakes with a lagoon character dry out in summer. Connection of lakes with the sea is through a narrow strait, except for Tatlı and Gıcı (ETBAR, 2016).

Lake Karaboğaz is located on the west coast of Kızılırmak and its area is 295 hectares. The lake is generally 5-6 m. deep and is rich in nutritious substances. Also, there are carps, grey mullets, and zanders in the lake.

Lake Cernek is within borders of the Doğanca Town in Bafra district in Samsun on the east of the Kızılırmak, at 20 km distance to Bafra. Being one of the biggest lakes of the delta, Lake Cernek is a very important area for the species and population of waterfowls. It is a feeding and breeding area for permanent waterfowls and a temporary shelter and feeding area for migratory birds during migration season, since especially it is located on the migration route of migratory birds (Can et al., 2012).
Lake Liman is at 20 km distance from Bafra. The 3 km long lake approaches to the sea through some branches. Length of these branches amount to 2000 m at some points. Grey mullets and carps are fished in the lake.

Lake Balık covers an area of 1380 hectares within the borders of the Ondokuzmayıs district located on the east side of the Kızılırmak delta. It is also possible to see shads and anchovies in Lake Balık in years when water level is high. Lake Balık is connected to the Black Sea through a canal of 1-2 m width. This connection is continued artificially for production of grey mullets (2008-2012 Management Plan of the Kızılırmak Delta).

Lake Uzun is located on the east side of the Kızılırmak Delta and its area is 293 hectares. Depth of water is around 1.5 m, although it reaches to 2 m in the middle. Lake Uzun connects to the Black Sea through the Kumcağız Strait (2008-2012 Management Plan of the Kızılırmak Delta).

Although the acts to which our country is also a party are generally concerned with the Mediterranean, they include articles for the protection of the natural structure at the coastal areas of all the countries that are party to acts. The Natural Protected Area of Priority 1 located in the Wetland and Bird Paradise in the Kızılırmak Delta also includes the coastal site as a zone on the north of the delta. However, there is not any data regarding the importance of biodiversity of the coastal site. The most important connection of the coastal site with the delta is that the lakes in the delta are interrelated with the sea in terms of intervention of salt water. It is known that there is an extension of the sea towards the land on the section of the delta which might be specified as the cape of the delta. In order to prevent increase of the losses caused by the sea on the

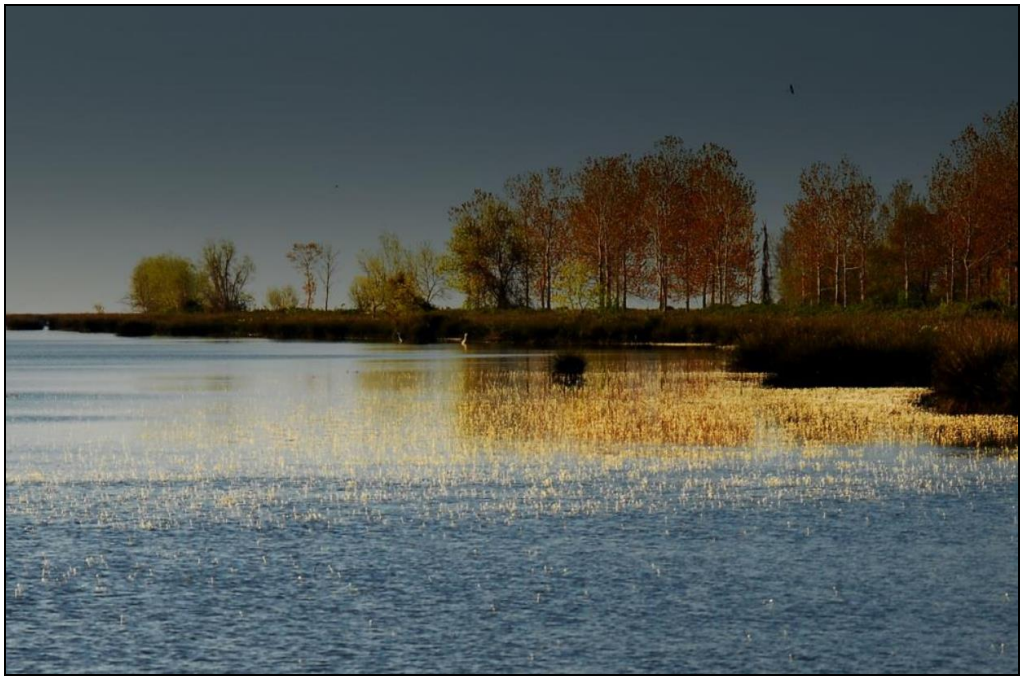
land, there are shore protection fortifications (groins) in the delta, where River Kızılırmak runs into the sea, which were built to prevent shore loss. When the year of construction, and before and after of the shore protection fortifications (groins) made on the right shore of the delta, and the change of the coastline through years are considered, the groins were seen to have a positive contribution by reducing the coastal erosion. The purpose of the groins made by DSİ is to stop the recession in the delta.

2.4.4. LANDSCAPE VALUES

Landscape values of the Kızılırmak Delta are based on the habitat structure of the area, current use of lands, and assessments regarding natural and cultural structure.

General Landscape Characteristics

The Wetland of the Kızılırmak Delta is positioned on plane topography. The area, majority of which is a wetland, stands out with reeds and aquatic plants characteristic to wetland vegetation. These reeds and aquatic habitats form the most important natural component of visual landscape. Another important component of natural landscape of the area are wild animals (birds, horses, water buffaloes, etc.) settled in the area both seasonally and permanently. There are also pasture vegetation type partial woods in the area.



Photograph 2.20 The Kızılırmak Delta

The majority of the site consists of plane areas, where it is possible to find aquatic vegetations along with pasture vegetation type, both due to the high level of the ground water and as the character of the wetland. It is possible to come across groups of small

trees within the area, most of which are non-evergreen. In areas where pasture vegetation structure is prevalent, stock raising activities become feasible, as a cultural landscape element. Rural settlements and agricultural sites are present at sites out of the natural parts of the area. Along with this, woods with a flooded forest character are also available within a very limited section, as another natural landscape characteristic.

Natural Landscape Characteristics

Deltas provide a shelter and food source for wild life species of a rich diversity, mainly for waterfowls, with the food chain provided by high productivity. Availability of habitats with different ecological characters, such as seas, rivers, lakes, marshes, meadows-pastures, forests, dunes, and agricultural sites and suitable weather conditions have provided the delta to have a significant extent of biological diversity.

2.4.5. ARCHAEOLOGICAL AND NATURAL PROTECTED AREAS

Archaeological Protected Areas

The Wetland and Bird Paradise of the Kızılırmak Delta does not involve any archaeological protected area. The main archaeological site of value closest to the delta is İkiztepe ruins. Located within the borders of İkiztepe Village on 7 km north-west to Bafra district of Samsun province, İkiztepe ruins consist of four high points. It is an archaeological site of priority 2. The traces of Chalcholithic Age, Bronze Age, and Transitory Age (pre-Hittite) were found upon diggings made here, also with a grave dated back to the First Bronze Age III and a tumulus-type mausoleum with two chambers and a dromos on the last cultural layer of İkiztepe on Hill I. This grave was set to belong to Hellenistic Age.

Natural Protected Areas

Majority of the Kızılırmak Delta was announced as a Natural Protected Area of Priority 1 on 21.04.1994, and then Priority 2 and 3 with borders extended. In the environment plan of scale 1/25.000 made in 1996, the wetland protected areas (strict preservation, ecological exposure, and buffer zones) were identified, taking into consideration the ecosystem of the wetland and habitats related with the system, and special plan decisions were developed to regulate the principles of protection and use for each region. Upon being enlisted in the Convention on Protection of Wetlands (Ramsar) on 15th April 1998, the area was guaranteed at international level for protection of its ecological character in-situ. The Kızılırmak Delta is the biggest and most important wetland on the coast of the Black Sea in Turkey, which could have remained natural.

2.5 USAGE OF NATURAL SOURCES

2.5.1. PURPOSE OF USING AND QUANTITY OF WATER

The underground and surface water, as the most important source of the Wetland and Bird Paradise in the Kızılırmak Delta, is used for various purposes such as drinking-usage, agricultural irrigation, and fulfilling the need of water in industrial and energy sectors. The main source of water in Bafra Plain is River Kızılırmak. The average annual flow rate of River Kızılırmak is 184 m³/sec.

The first drainage works started in 1960s in Bafra Plain. There was not any irrigation network in those years. With the start of works, canals were opened to discharge the water that comes from the upper basin and cannot find a natural outlet. As the drainage canals opened in those years had a connection with the Kızılırmak, they were used for the purpose of irrigation in dry times. These canals opened in the study area are namely Koşuköy, Hacılar, Çorak, Boytar, and Bakırpınar main drainage canals. (Arslan et al., 2007). In addition, there is Bafra İkizpınar Pond in Bafra, with a storage volume of 1256 hm³ (http://bolge07.dsi.gov.tr). There are 874 wells in total on the border of the Sub Basin of the Kızılırmak Delta, located within the borders of Ondokuz Mayıs, Alaçam, and Bafra districts, and in terms of the purpose of use of the underground water, it is mostly for the purpose of irrigation. %2 of the underground water used for industry is used by the engineering companies that carry out geological surveys in Bafra, Alaçam, and Ondokuz Mayıs districts.

The water in irrigation facilities of the State Hydraulic Works (DSİ) is taken from the drainage network of the Derbent Dam, which was put into service in 1991. The S1 canal that supplies water to the area is 35 km in total. Irrigation is made through the S2 canal in the form of a substitute canalette with a total length of 24 km. As the plants sowed are generally the type of plants that need surface irrigation, drip and sprinkling irrigation systems are widely used in the plain. (Yeniyurt et al., 2008).

WATER USAGE (PITS) MAP

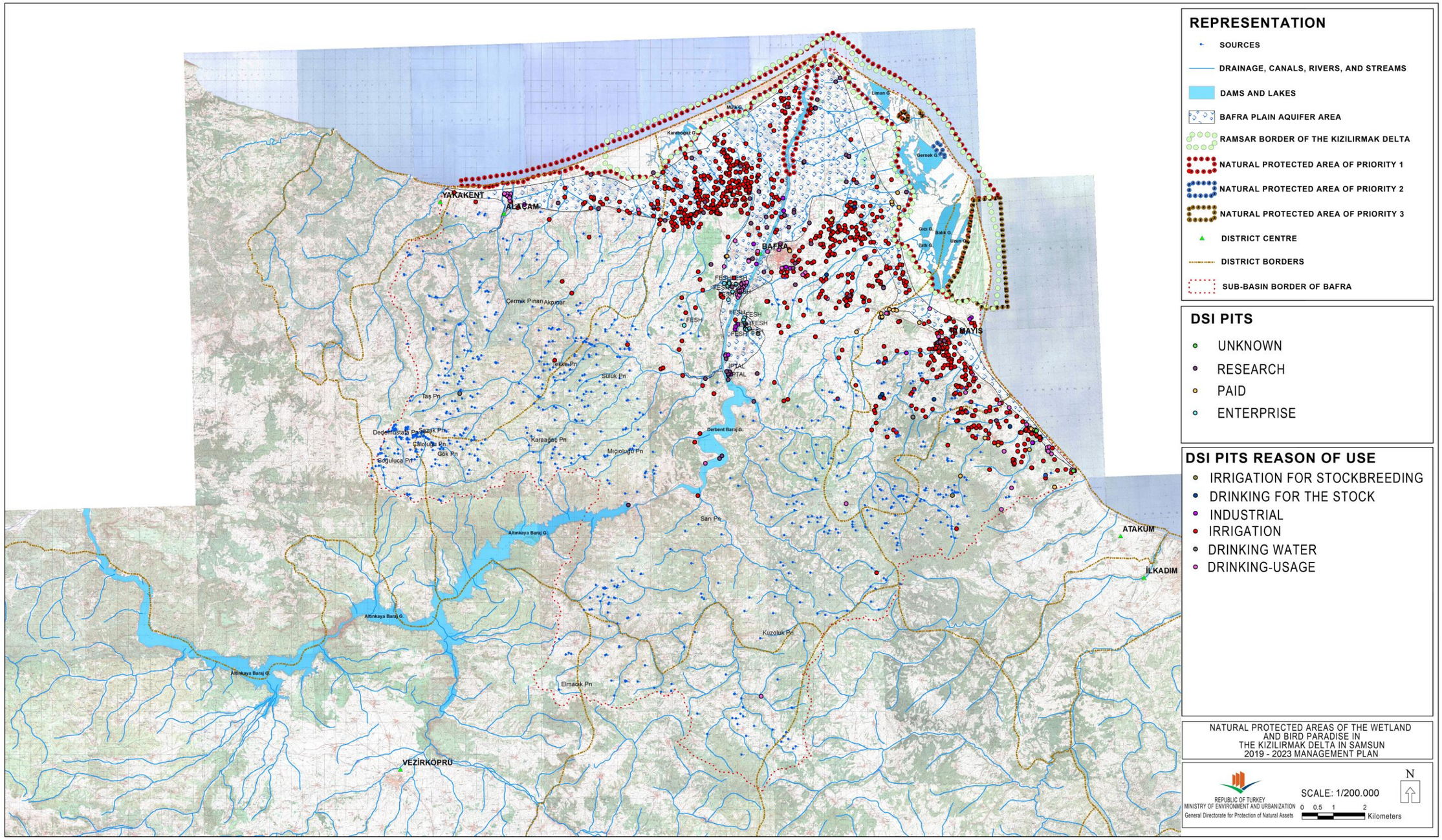


Figure 2.14. Usage of Water within the Borders of the Lower Basin of Bafra

2.5.2. FISHERY

According to the current status and site observations regarding fishery in the Coastal Area adjacent to the delta and in the Derbent Dam Reservoir (DBG) located on the upper basin of the Kızılırmak Delta (KD), the coast of the Black Sea, Karaboğaz, Liman, Cernek, Balık, Lake Tatlı, Lake Gıcı, Lake Uzun, and DBG in the Kızılırmak Delta are areas where hunting/ breeding of aquaculture products is carried out. This area directly and indirectly relates to the wetland complex in the Kızılırmak Delta.

Table 2.4 Fish breeding facilities with their capacities set in the Derbent Dam Reservoir located in the upper basin of the Kızılırmak Delta and that feeds the delta with discharged water in the delta (Source: Records of GTHB, Samsun Provincial Directorate, 2017)

Sequence No	Name	Capacity	Species
1	Dostlar Aquaculture Products Production Plant	240 tons/year	Trout
2	Kıyak Kardeşler Trout Production Prj	490 tons/year	Trout
3	Furkan Aquaculture Products	250 tons/year	Trout
4	Kuzey Aquaculture Products Breeding Plant	922 tons/year	Trout
5	Boğazkaya Trout Aquaculture Products	240 tons/year	Trout
6	Orhan Orta Trout Production Plant	200 tons/year	Trout
7	Kaya-4 Trout Aquaculture Products	480 tons/year	Trout
8	Parlak Trout Production Plant	480 tons/year	Trout
9	Türköz Trout Breeding Plant	29 tons/year	Trout
10	Kaya 2 Trout Aquaculture Products	900 tons/year	Trout
11	Kuzey 2 Trout Production Plant	960 tons/year	Trout
12	Samsun Balıkçılık-6 Trout Breeding Plant	950 tons/year	Trout
13	Trout Breeding Prj in Floating Net Cages	29 tons/year	Trout
14	İskele Aquaculture Products Production	900 tons/year	Trout
15	Doğanca Köyü Carp Production	No production	Carp
	Total	6970 tons/year	

Table 2.5 Limited Aquaculture Fishery Cooperatives that are engaged in trade purpose fishing in the ponds in the Kızılırmak Delta and in the Derbent Dam Reservoir, number of members, location of operations. Yörükler are registered in the Ondokuzmayıs district, and others are registered in the Bafra district (Source: GTHB Samsun Bafra District Directorate Records, 2017)

Sequence No	Name	Number of Members	Place of Operations
1	Sarıköy Aquaculture Products Cooperative	138	Fish ponds
2	Doğanca Aquaculture Products Cooperative	200	Fish ponds
3	Yeşilyazı and Altınova Aquaculture Products Cooperative	37	Fish ponds
4	Emenli,Şirinköy, Habilli and Surrounding Villages Aquaculture Products Cooperative	46	Lake Karaboğaz
5	Yörükler Aquaculture Products Cooperative	385	Fish ponds
	Total	769	

Fishing, fresh water lobster (crayfish) hunting, snail and medicinal leech collecting have been practiced in the lakes in the Kızılırmak Delta for a long time. Fishing is an integral part of the delta and wetlands. 6 Limited Aquaculture Products Cooperative for the Purpose of Fishing are established in the area, some of which are not active at times. There are about 769 fishers registered to these cooperatives, according to the data of

2017. Site observations have revealed that fishers basically hunt carp, grey mullet, pike perch, and pool fish, and fresh water lobster (crayfish) in the lakes on the right part of the delta. In addition, cage fishing is practiced in the wetlands of the delta.

In coastal areas of the delta, adjacent to the sea, the fish are hunt from the sea, where no discrimination was made as an area. 19Mayıs District Dereköy Fishing Port (S.S. Dereköy Aquaculture Products Cooperative), Alaçam Toplu Göçkün Doyran Fishing Port (S.S. Toplu, Göçkün Doyran Aquaculture Products Cooperative), and Yakakent Fishing Port (S.S. Küplüağzı Aquaculture Products Cooperative) are in operation on the sea part of the delta.

Table 2.6 Fishery production data across Samsun province for the year 2016 (tons) (Source: Records of GTHB, Samsun Provincial Directorate, 2017)

Hunting			**Breeding**			**Total**
Sea	Inland Water	Total	Sea	Inland Water	Total	
54.709,68	125,53	54.835,21	3.600,00	1.984,69	5.584,69	60.419,90

Although known to be hunted in the Kızılırmak Delta (especially Lake Cernek), no up-to-date production/ hunting data could be accessed about *Astacus leptodactylus* (crayfish) and collected medicinal leeches, frogs, and snails.

According to the records of the District Directorate of Food, Agriculture, and Stockbreeding of Bafra, it was reported for the year 2016 (except for the Yörükler Cooperative) that 16.000 kg carps, 24.000 kg grey mullets, and 3.500 kg pike perches were hunted. There are 385 members registered to the Yörükler Cooperative in the records of Ondokuzmayıs District Directorate. 6482 kg carps, 9231 kg grey mullets, and 1386 kg pike perches were hunted by the members of this cooperative in 2016. The data about the pool fish cannot be accessed, which were hunted and taken to the shore by fishers. According to the site observations (landing points in lakes Cernek and Balık), hunted pool fish were at least 3 times the other species. When these data are taken together with Table 2.6., the majority of the hunt of 125,53 tons is considered to have been obtained from the lakes in the Kızılırmak Delta.

2.5.3. AGRICULTURE AND STOCKBREEDING

Agriculture

Beside diversity of products thanks to its geographical and soil structure, Samsun has a high potential with the livestock and variety of animal products, investments made in aquaculture products and fishery, and most importantly qualified manpower. This makes Samsun privileged in terms of plant and animal production. The Kızılırmak Delta, which covers a part of Alaçam, Bafra, and Ondokuzmayıs districts on the coastal band, is the only wetland on the shore of the Black Sea in our country with natural characteristics sustained in their original form. The topography of the delta may be generally classified

as plane to near-plane inclination. Inclination is generally between 0% and 2%. Areas with an inclination of 0% are generally located among the dunes.

The majority of people in the Kızılırmak Delta are engaged in agriculture. It may be classified in two categories as field and garden agriculture. Rice is cultivated in parts nearest to water.

Table 2.7 Sizes of Agricultural Production Areas

District Name	Total Area (decares)	Cultivated area of grains and other plants (decares)	Fallowed area (decares)	Area of vegetable gardens (decares)	Area of fruits, drink and spice plants (decares)	Area of Ornamental Plants (decares)
Alaçam	244.343,00	204.492,00	31.985,00	4.984,00	2.882,00	0
Bafra	595.908,75	479.217,00	15.592,00	75.739,00	25.310,00	50,75
Ondokuzmayıs	64.391,00	34.044,00	0	2.162,00	28.169,00	16

Source: TÜİK,2016

When evaluated in this aspect, cultivation of fodder crops is performed in Ondokuzmayıs and Bafra districts, but to a lesser extent.

Table 2.8 Greenhouse areas in Alaçam, Bafra, and Ondokuzmayıs districts

District Name	Total area (decares)	Glasshouse (decares)	Plastic house (decares)	High tunnel (decares)	Low tunnel (decares)
Alaçam	9	0	1	8	0
Bafra	102,25	0	22,25	80	0
Ondokuzmayıs	30,2	0	13,2	17	0

Source: TÜİK,2016

Photograph 2.21 Agricultural Area in the Delta

Stockbreeding

According to the data of Turkish Statistical Institute for the year 2016, out of the 14.222.28 bovine animals in Turkey, 314.398 of them are in Samsun province (TÜİK, 2016).

Table 2.9 Annual number of bovine animals and animal production in Alaçam, Bafra, and Ondokuzmayıs districts

District Name	Animal	Adult	Young-Juvenile	Total	Number fo milked animals (each)	Milk (Ton)
Alaçam	Water Buffalo	1.460	340	1.800	887	879
	Cattle (Culture)	3.125	1.275	4.400	1.755	6.702
	Cattle (Hybrid)	8.965	4.600	13.565	5.468	14.981
	Cattle (Local)	2.310	925	3.235	945	1.151
Bafra	Water Buffalo	5.155	1.850	7.005	3.524	3.488
	Cattle (Culture)	9.915	4.605	14.520	5.225	19.952
	Cattle (Hybrid)	14.950	6.550	21.500	7.740	21.208
	Cattle (Local)	4.540	2.308	6.848	2.475	3.015
Ondokuzmayıs	Water Buffalo	1.341	259	1.600	863	854
	Cattle (Culture)	814	78	892	491	1.873
	Cattle (Hybrid)	7.580	3.615	11.195	4.703	12.885
	Cattle (Local)	121	9	130	94	114

Source: TÜİK,2016

Stockbreeding has an important place in the livelihood of the people of the locality. Stockbreeding is generally performed in the villages located around the wetland. There are mainly ovine stockbreeding facilities in the delta. Especially in the villages of the Bafra district, animals feed on the pastures in the lakes region. Farmers who are engaged in stockbreeding generally set their animals free in these areas for 4-5 months. The entire pastures and meadows in the delta have the characteristic of a ground meadow. Their most remarkable property is that they remain under water for 4-5 months in a year. All of the vegetation in the pastures have aquatic and water-resistant vegetation.

2.5.4. TOURISM

The Wetland and Bird Paradise in the Kızılırmak Delta is a very suitable area for eco-tourism with the rich diversity of plants and animals it owns thanks to accommodating various habitats. The Bird Paradise in the Kızılırmak Delta is an extremely important feeding and accommodation area not only for small singing birds that fly over the Black Sea for front migration and waterfowls, but also for avian predators, storks, cranes, and fish. For this reason, it is a focus of interest for bird watchers, nature photographers, and people who do nature sports. Arrangement of wooden corridors of a portion of the bird paradise and the observation terrace set up for observing the site better has made the area more convenient for nature tourism.

With the rise of water in spring, wide areas are submerged and almost all of the lakes on the right shore of the delta unite to appear like a single lake. The majority of the non-evergreen forests between Lake Balık and the sea are also submerged in that season. Although these forests have lost their integrity today, the Galeriç Forest on the north of the Yörükler Village still keeps its integrity. Beside being one of the rare flooded forests in our country, this forest is a place worth seeing in the delta for the people who are keen on trekking and nature sports.

The dunes between the lakes and the sea are among the characteristic formations in the delta. The elevation of the dunes is 7-8 meters, which lay along the coast in bands of 200- 300 meters. In some places, they are observed to reach upto an elevation of 12 meters. The shores of the Bafra District, which is at 51 km distance to Samsun, have wide natural beaches of sand.

Upon evaluation of the number of visitors to the area in general; it is specified to be around 18.000 in 2014, 30.000 in 2015, and 100.000 in 2016 (Samkuş, 2017). Less than 10% of the number of tourists who visit Samsun province (2014: 399.550, 2015: 433.318, 2016: 449.735) is seen to visit the Kızılırmak Delta. Although there have been serious attempts for the publicity of the area in recent years, these efforts should be rised to both national and international level. Also, a visitor management is being planned for the area. Within this context, the profiles of the visitors to the area will be determined and activities will be organized according to the expectations of visitors.

2.5.5. HUNTING

Hunting has been practiced in the Kızılırmak Delta since the early ages for the local and migratory poultry in the wetland. Hunting is as old as fishing in the area. Although the profile of hunters in the Kızılırmak Delta is variable, they generally consist of officials, artisans, retired men, and peasants. Hunting is not an essential way of living but a kind of sport in the area. There has been no food purpose hunting in the delta within last 15 years. Samsun, Bafra, 19 Mayıs, Alaçam, Yakakent, and Taflan hunting and shooting foundations are in function in the Kızılırmak Delta. The hunting and shooting foundations across the delta set their purpose as bringing the hunters together, carrying out training activities, and providing the exercise of conscious hunting. However, the hunting foundations in the Kızılırmak Delta complain about the bureaucratic procedures, annual hunting fees, limitedness of the days of hunting, littleness of the hunting borders of the area, and unauthorized hunters.

But recently, with the efficient support of the Gendarmerie, unauthorized hunting has been prevented in some regions (particularly, on the right shore of the delta). The endeavours of Samsun Metropolitan Municipality in the Bird Paradise have prevented

uncontrolled hunting activities in the wild life improvement site on the right shore and the lakes region (lakes Liman, Cernek, Tatlı, Gıcı, Balık, and Uzun).

The hunting ban areas and hunting areas in the Kızılırmak Delta are given below, according to the data from 2017-2018 Central Hunting Commission (MAK) Decision.

Hunting Ban Areas

Bafra-Ondokuzmayıs District: West and South: From the coast of the Black Sea through Çerkezler Village, Doğanca, Sarıköy, Gazibaba, Kalaba, and Taşköprü road, the Black Sea below Meşelik Village (directly related with the delta).
East-north: The Black Sea.

Hunting Areas

1. **Bafra General Hunting Ground; East:** The line that begins from the Kuşçular hill, follows the borderline from 19 Mayıs to Bafra districts and the Ramsar border of Üçpınar Village, and extends to Lake Liman, **West:** The line that begins from the hatches of the Derbent Dam, follows the Kızılırmak, and extends to Bafra Cape where the Kızılırmak flows into the Black Sea, **North:** The line that follows the Ramsar border Lake Liman and extends to the Kızılırmak over Koşu Village, **South:** The line that follows the border of 19 Mayıs and Bafra districts, Bafra-Kavak road through the Kuşçular hill, and extends to the hatches of the Derbent Dam (directly related with the delta).
2. **Karaboğaz General Hunting Ground; East:** The line that begins from the hatches of the Derbent Dam, follows the Kızılırmak, and extends to the place where Kızılırmak flows into the Black Sea. **West:** The line that extends to the Black Sea, beginning from the side of Altınkaya Dam (Sarıkaya hill) and following the border of Bafra and Alaçam districts, **North:** The line that extends to Koşu Village where the Kızılırmak flows into the sea from the border of Alaçam and Bafra districts, locality of Karaboğaz, **South:** The line that extends to the hatches of the Derbent Dam, following the dam lake of Altınkaya (directly related with the delta).

Hunting Ban Areas because of being Allocated as Wild Life Improvement Area:

1. **Wild Life Improvement Area of the Kızılırmak Delta in Bafra:** (Hunting is banned within the borders as published in the Official Gazette dated 16.10.2005 and no. 25968.) (Directly related with the delta.)

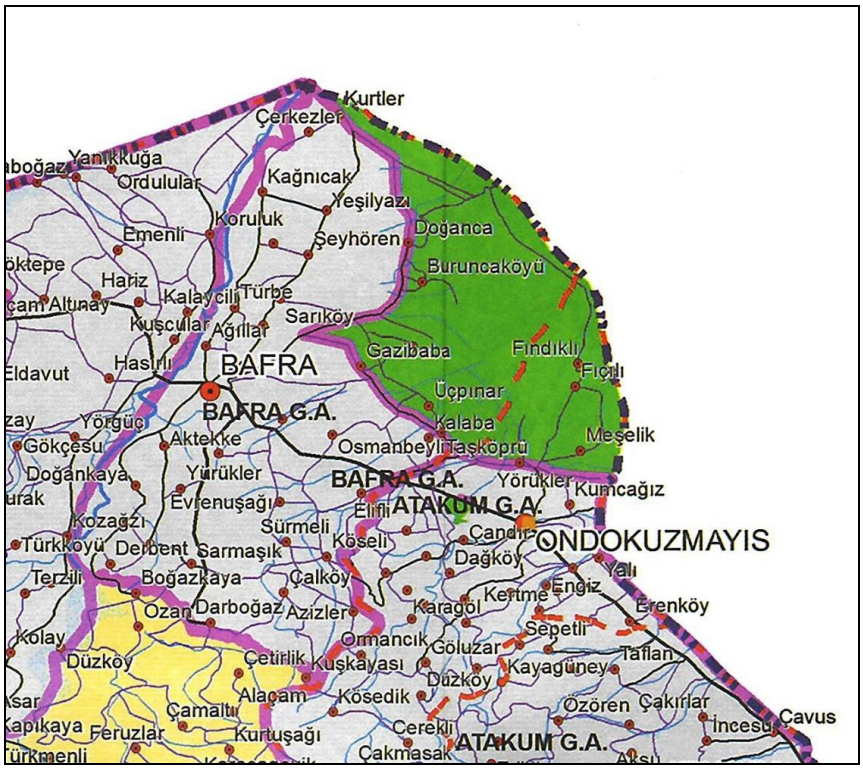


Figure 2.15. Central Hunting Commission (MAK) Decision Map that was published in the repeated Official Gazette dated May 2017 with issue no. 30073 (the area shown in green is the hunting ban area)

According to the MAK Decision Map that was published by the Turkish Ministry of Forestry and Water Affairs in the repeated Official Gazette dated 22nd May 2017 with issue no. 30073, the hunting activities used to be performed through guidance or with restriction (sites where hunting was exercisable within framework of the special hunting plan) within framework of special laws under Land Hunting Act are no more exercisable across the delta, except for Karaboğaz General Hunting Area, because of the priority of protection of the delta.

Decisions for protection brought along with the priorities of protection have caused occurrence of certain problems in the area. These problems and appropriate suggestions of solutions may be summarized as follows upon a sociological study carried out under the project in the area.

For the purpose of providing sustainability of the Wetland and Bird Paradise in the Kızılırmak Delta, necessary measures were taken in the area for the breeding and increasing the number of the bird species. However, upon examination of the matter by the District Command of Gendarmerie of Alaçam, it is possible to say that responsibility increases in the region used as a hunting area, namely Karaboğaz Hunting Area in Habilli Neighbourhood, located in the area. Within this context, with the right shore banned for hunting, Karaboğaz Hunting Area has become excessively demandable by the hunters in Samsun province and neighbouring provinces. Problems have been

arising between the residents and hunters in the neighbourhoods with a border to Karaboğaz Hunting Area due to intensive hunting activities, which problems require a separate study.

2.5.6. GRAZING

After agriculture, the second most important means of living of the people in the delta is stockbreeding. Stockbreeding is generally carried out in the villages around the wetland.

The Kızılırmak Delta is the place with the highest population of water buffaloes in our country. The number of water buffaloes which was 10.272 in 1990 reduced to 2.173 in 2010, which number swiftly increased and raised upto 11.266 in 2017 with the increase of the incentives provided by the government for the improvement of water buffalo raising. However, there is no information about how many of these graze in the delta throughout the year.

Table 2.10 Variation of the number of water buffaloes in the delta between years 1990–2017

Years	**1990**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Number of Water Buffaloes	10.272	5.750	4.950	4.700	4.550	4.100	3.750	3.550	2.800	-
Years	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Number of Water Buffaloes	-	-	2173	2562	3246	3777	4652	5553	7677	11266

Water buffaloes are an important element of the wetland ecosystem in the Kızılırmak Delta, just like birds and fish. They have been living in harmony with other species in the wetland for hundreds of years. The existence of the water buffaloes in the delta is important also for controlling the spread of many wetland plants, refreshing of the reeds, and nestling of the birds in reeds and marshes (forming of shelters) (Management Plan of the Kızılırmak Delta, 2008-2012).

After water buffaloes, sheep are the second most crowded group of animals that graze in the delta. There are 9-10 sheep folds in the delta, which belong to the residents of the Yeşilyazı Neighbourhood.

In the delta, water buffaloes are set free in spring, where they spread out freely until they are taken back into the stable in autumn. As they do not stay at a single place and walk around everywhere in the delta, they do not have impose pressure only to a specific habitat. Ovine animals stretch out at certain points in wet pastures and dry marshes. There are about 3000 sheep in the delta.

Herds of sheep are taken into the bush areas in the section between Lake Cernek and the coastal site in an uncontrolled manner, which impairs rotation of plants and causes damage in the dunal area.

2.5.7. OTHER USES OF LANDS

Reed Harvesting

Another traditional use of the delta is reed cutting. Common reeds (*Phragmites australis*), narrow-leaved cat-tail (*Typha angustifolia*), and club-rush (*Scirpus lacustris*) are cut and marketed. The cut out reeds are generally used for making rush mat, basket, etc., covering the roofs of buildings, especially animal shelters, and laying on the ground in stables. Reeds are also used as a fuel instead of wood in traditional furnaces for baking bread. As reeds grow in nature by themselves, they make a costless gain without requirement of any labour other than harvesting. As the quality of the reeds in the delta has reduced today, the exporting company did not purchase in 2017, thus a limited number of reeds are cut in a controlled manner.

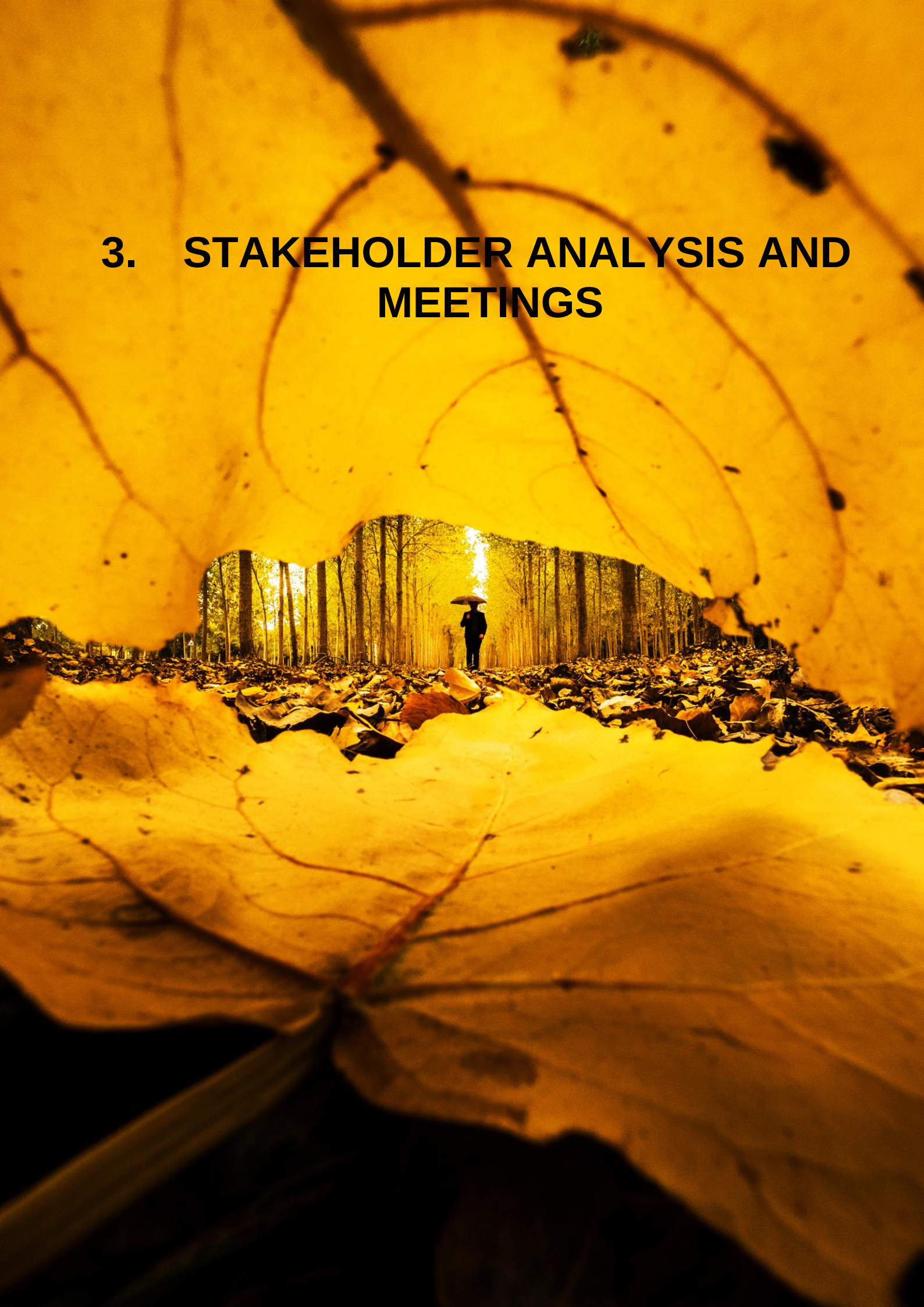
Photograph 2.22 Reed Field on the Left Coast Site of the Delta

Rush (Juncus sp.) Harvesting

Rushes (*Juncus* sp.), found plenty in the Kızılırmak Delta, are harvested and dried out by the villagers (Yörükler, Doğanca) and then dispatched to various places in our country (Ankara, Adana, Sivas, etc.) through the channel of mediators. Rushes are used by florists in arranging bouquets, for which no official procedure and harvesting permit is required. Dismantled manually without being cut towards the end of summer, rushes have become a source of income for the families in the delta.

Photograph 2.23 The rush plant (M.Ercan Bilgen)

3. STAKEHOLDER ANALYSIS AND MEETINGS



3. STAKEHOLDER ANALYSIS AND MEETINGS

3.1. STAKEHOLDER ANALYSIS

Discussions with stakeholders are very important for defining the key actors who might be (directly or indirectly) related with the Management Plan of the Natural Protected Areas in the Kızılırmak Delta in Samsun or who might influence and be influenced by the implementation and consequence of the management plan. In this study which aims to suggest a sociological perspective about the Kızılırmak Delta that covers the borders of 19 Mayıs, Bafra, and Alaçam districts in Samsun province, first the essential elements of the socio-economic structure of the Kızılırmak Delta were set forth, the basic demographic structure of the delta was identified, and the expectations and problems of the stakeholders were explained, considering the Management Plans carried out previously. For this reason, qualitative (interview, focus group discussion) research techniques were employed in the study. Within this context, the problems mentioned by the authorized persons from public entities and institutions as regards to the Kızılırmak Delta are put forth in the following sections. Additionally, headmen were also interviewed when the villages in the delta were in question.

The general socio-economic status of the villages is summarized in Table 3.1. upon bilateral negotiations. Extended details of the bilateral negotiations performed under the project are given the study notes.

Table 3.1 The socio-economical status set according to the interviews made with the village headmen

Villages	Infrastructure Status		Basic Means of Living	Problems
	With	Without		
Sahilkent Village 65 houses (243 persons)	Grocery (1), mosque (1), cooperative (1), mains water, electricity, internet and telephone	Primary school, high school Bank, post office, coffeehouse, health centre, Sewerage system	Agricultural production (rice) Stockbreeding	Pasture problem, height of water level, existence of disputed lands (old 145 parcel)
Fener Village 150 houses (750 persons)	Mosque (2), cooperative (1), mains water, electricity, internet and telephone	Primary school, high school, bank, post office, coffeehouse, grocery and health centre	Agricultural production (rice) Stockbreeding	Stabilized road, existence of protected areas, insufficiency of street lamps and drinking water, insufficiency of water of the irrigation union
Yeşilyazı Village 300 houses (1700 persons)	Grocery (2), mosque (4), Cooperative (2), bakery (1), coffeehouse (4), secondary school (1),mains water, electricity, internet and telephone	Sewerage system	Agricultural production (rice) Stockbreeding (~50 houses engaged in fishery)	Stabilized road, existence of protected areas
Koşuköy Village 280 houses (1350 persons)	Mosque (3), coffeehouse (2), grocery (1), nursery school (1) and Cooperative (1)	Primary school, high school, bank, post office and health centre	Agricultural production (rice) Stockbreeding (~15 houses engaged in fishery, 2 poultry farms, 6 cattle farms, and 2 sheep farms)	Existence of a stabilized road, cut-outs sourced from worn-out electric lines
Sarıköy Village 230 houses (1000 persons)	Mosque (8), cooperative (1) mains water, electricity, internet and telephone	Primary school, high school, bank, grocery, post office and health centre, sewerage system	Agricultural production (rice) Stockbreeding (2 poultry farms, 28 licensed persons engaged in fishery)	Existence of a stabilized road, problems related to stockbreeding caused from the imbalance of the water level, absence of electricity and sewerage system
Altınova Village 120 houses (532 persons)	Mosque (6), cooperative (1) village hall (1), mains water, electricity, internet and telephone	Primary school, high school, bank, grocery, coffeehouse, post office and health centre, sewerage system	Agricultural production (rice) Stockbreeding (~ 15 houses engaged in fishery, water buffalo raising limited to certain neighbourhoods (Erbağlılar, Karaboğaz, and İğdirliler)	Stabilized road, problems related to stockbreeding caused by the discharge of water to the pasture in summer, existence of disputed lands, absence of sewerage system

Villages	Infrastructure Status		Basic Means of Living	Problems
	With	Without		
Doğanca Village 2200 persons	Primary school (1), grocery (3), health centre (1), mosque (6), coffeehouse (1), Cooperative (1), mains water, electricity, internet and telephone	High school and bank, sewerage system	Agricultural production (rice) Stockbreeding (~20 houses engaged in reed harvesting, ~30 houses engaged in fishery)	Stabilized road, problems related to energy lines, extent of agricultural inputs
Şirinköy Village 40 houses (220 persons)	Mosque (1), mains water, electricity, internet and telephone	Primary school, high school, bank, grocery, coffeehouse, post office and health centre, sewerage system	Agricultural production (wheat, corn, trefoil, vetch) and stockbreeding	Stabilized road, sewerage
Doyran Village 200 houses (1500 persons)	Mosque (2), mains water, electricity, internet and telephone	Primary school, high school, bank, grocery, coffeehouse, post office and health centre, sewerage system	Agricultural production (rice) and stockbreeding	Absence of approach roads, existence of protected areas
Habilli Village 120 houses (340 persons)	Mosque (4), cooperative (1), mains water, electricity, internet and telephone	Primary school, high school, bank, grocery, coffeehouse, post office and health centre, sewerage system	Agricultural production (rice) and stockbreeding (~10 houses engaged in fishery)	Road, existence of protected areas
Yörükler Village 960 houses (1700 persons)	Mosque (5), grocery (4), health centre (1), cooperative (1), mains water, electricity, internet and telephone	Primary school, high school, bank, post office, sewerage system	Agricultural production (rice) and stockbreeding (~ 150 persons engaged in fishery, 45 of whom licensed)	Existence of property/ protected areas, absence of a road
Üçpınar Village 300 houses (640 persons)	primary school (1), mosque (4), grocery (1), mains water, electricity, internet and telephone	Cooperative, health centre, high school, bank and post office, sewerage system	Agricultural production (rice) and stockbreeding, fishery (5 persons in average)	Absence of a road, electric cut-outs
Ermenli Village (515 persons)	Mains water, electricity, internet and telephone	Sewerage system	Agricultural production (rice) and stockbreeding	No information could be received because of rejection by the village headman.

As a consequence, existence of more than one protection status and therefore more than one public institutions being authorized in the Kızılırmak Delta cause confusion of powers in the area. With the impact of the protection status of the delta being constituted of protected areas of priority one, activities carried out in the area such as agriculture, stockbreeding, fishery, and hunting have been attempted to be solved sometimes through legal means and sometimes verbally. Just at this point, adaptation of the local people to the new structure to be formed with the re-setting of the protected areas should be cared for. Accordingly, a common language should be formed with public entities and institutions.

Protection and management of the water sources in the delta gain importance when it comes to fishery, agriculture, stockbreeding, and hunting. The problems encountered by the local people in transportation should be minimized. Existence of basic problems concerning the infrastructure in the area is a problem for the local people.

Any trip to the area should be taken under control through the visitors plan. At this point, the bearing capacity of the area should be taken into account.

The local people have a sense of belonging. Any person who has identified themselves with the area would have an improved sense of protection. However, there are shortcomings about what is included and excluded by the content of protection. Accordingly, awareness raising studies should be carried out without impairing the sense of belonging of the local people.

- **Meeting of Stakeholders**

The meeting of stakeholders was held on 23rd November 2017 with participation of the focus groups to the widest extent in order to provide active participation of stakeholders to the planning process within scope of the Management Plan of Natural Protected Areas in the Kızılırmak Delta. 116 persons in total attended the meeting of stakeholders from various entities, institutions, and local people. The entities and institutions that attended the meeting are listed below.

General Directorate for Protection of the Natural Assets, Ministry of Forestry and Water Affairs Directorate General for Nature Conservation and National Parks, General Directorate for Water Management of Turkish Ministry of Forestry and Water Affairs, Samsun Governor's Office, 19 Mayıs District Governor's Office, Samsun Metropolitan Municipality, DSi Directorate of 7th Zone, Directorate of 10th Meteorology Zone of Samsun, Regional Directorate of Agricultural Credit Cooperative, Provincial Directorate of Environment and Urbanization of Samsun, Samsun Branch Office of the XIth Regional Directorate of Turkish Ministry of

Forestry and Water Affairs, Provincial Directorate of Food, Agriculture, and Livestock of Samsun, Seed Certification Test Directorate of Samsun, Agricultural Quarantine Directorate of Samsun, Agricultural and Rural Development Support Institution of Samsun (TKDK), Directorate of Science, Industry, and Technology of Samsun, SASKİ, Provincial Culture and Tourism Directorate of Samsun, Provincial Directorate of National Education of Samsun, İller Bank, Bafra Municipality, Alaçam Municipality, Samsun Branch Office of the 11th Zone Directorate of Ministry of Forestry and Water Affairs, Chief Office of National Parks of Bafra, District Directorate of National Education of 19 Mayıs, Bafra Forestry Department, District Directorate of Agriculture of Bafra, District Directorate of Food, Agriculture, and Livestock of Alaçam, Headman of Doğanca Village, Headman of Yeşilyazı Village, Headman of Yörükler Village in Samsun, Headman of Sarıköy, Headman of Üçpınar, Headman of the Habilli Neighbourhood, Headman of the Doyran Neighbourhood, Provincial Command of Gendarmerie of Samsun, District Command of Gendarmerie of 19 Mayıs, Coast Guard Command, District Command of Gendarmerie of Alaçam, Samsun 19 Mayıs University, Çankırı Karatekin University, Department of Biology, Süleyman Demirel University, Faculty of Aquaculture, Süleyman Demirel University, Department of Geology, 19 Mayıs University, Department of Environment Engineering, 19 Mayıs University, Faculty of Veterinary, 19 Mayıs University MYO, Samsun Veterinary Control Institute, Black Sea Agricultural Research Institute, Alaçam Vocational High School, Samsun Metropolitan Municipality Wild Animals First Aid Unit, 19 Mayıs Chamber of Agriculture, Bafra Chamber of Agriculture, Anadolu Site Soil Study, Yörükler Aquaculture Products Cooperative, The Hunters' Foundation, Local History and Culture Foundation, Altınkaya Irrigation Union, and Turunç Peyzaj Ltd. Şti.

Some Views from the Meeting of Stakeholders

Some Views from Sociological Studies (Focus Group Meeting and Bilateral Negotiations)

4. EVALUATION OF THE DATA

Kuş Gözlem Kulesi

4. EVALUATION OF THE DATA

4.1 ECOLOGICAL EVALUATION

4.1.1 Evaluations about the Flora and Fauna

554 taxons were identified in total in the Natural Protected Area in the Kızılırmak Delta. 1 known endemic species in the floristic composition of the delta is *Linaria corifolia.* But there are also rare species, though not endemic. For example, *Rhaponticum serratuloides* (Asteraceae), *Ambrosia maritima* (Asteraceae), and *Pancratium maritimum* (Amaryllidaceae) are endangered at national level, *Jurinea kilaea* (Astaraceae), *Galanthus rizehensis* (Amaryllidaceae), *Leucojum aestivum* (Amaryllidaceae), and *Thelypteris palustris* (Thelypteridaceae) are vulnerable (VU) plant species at national level, according to the Red Book of Turkish Plants. In addition, the species *Cyclamen coum* var. *coum* was also identified in this area, which is enlisted in the Appendix of the CITES Convention. This natural protected area is quite important both in floral and ecological terms for hosting country-wide endemic and rare plants, having various and special types of habitats, and setting an example of the flooded forests, which are rare in our country and in northern hemisphere. In a section of the area, there is not any significant species for the flora on the meadows that lay along as one of the most important food sources of animals (especially, for the water buffaloes).

Lake Balık (1389 ha), Lake Çernek (589 ha), Lake Uzun (293 ha), Lake Liman (322 ha), Lake Gıcı (125 ha), Lake Tatlı (52 ha), and Lake Karaboğaz (295 ha) lay parallel to the sea on both sides of the Kızılırmak Delta, which was formed with the embrace of River Kızılırmak with the sea, in the area within the borders of 19 Mayıs, Bafra, and Alaçam districts in Samsun province. A number of small and transitory water basins among these lakes that have a lagoon character dry out in summer. Connection of lakes with the sea is through a narrow strait, except for Tatlı and Gıcı. 35 fish species were identified in the Kızılırmak Delta, 7 of which are considered as “Critical-CR” (critically endangered) according to the IUCN category. Among the identified species, *Cyprinus carpio* (carp) and *Aphanius dandrofii* (sailton pupfish) are local species (Table 4.4). The species *Anguilla Anguilla* and *Acipenser nudiventris*, which were specified to be endangered in the Fish Species List, are pointed in recent studies and publications as not available any more (See Zengin et al., 2008 and 2013).

In terms of the amphibian species identified in the delta, they are species of wide distribution. There are not any species among these which might be considered as endangered. However, when considered that they immediately respond to natural processes such as climate change, monitoring of amphibian species at population

level is important. Among reptilian species, *Testudo graeca* (common tortoise) that has a wide distribution at global scale was considered as “Vulnerable-VU” according to the IUCN danger category (Table 4.3).

355 bird species in total were identified in the delta. 18 of the bird species identified in the Natural Protected Area were considered as “critical species” (Table 4.2). In addition, there are not any endemic bird species in the Kızılırmak Delta.

Table 4.1 Priority Plant Species for Protection in the Kızılırmak Delta

No	Family	Name in Latin	Name in Turkish/ English	Danger Category					
				International			National		
				CR	EN	VU	CR	EN	VU
1	Amaryllidacea	*Leucojum aestivum* L. subsp. *aestivum*	Gölsoğanı/ Summer snowflake						x
2		*Pancratium maritimum* L.	Kum zambağı/ Sea daffodil					x	
3	Asteracea	*Jurine kilae* Azn.	Kilyos moru/						x
4		*Rhaponticum serratuloides* (Georgi) Bobrov	Koca kekre/					x	
5	Thelypteridaceae	*Thelypteris palustris* (A. Gray) Schott	Karakız eğreltisi/						x

Table 4.2 Priority Bird Species for Protection in the Kızılırmak Delta

No	Family	Name in Latin	Name in Turkish/ English	IUCN Danger Category		
				CR	EN	VU
1	Charadriidae	*Vanellus gregarius*	Sürmeli Kızkuşu/ Sociable Lapwing	x		
2	Anatidae	*Oxyura leucocephalus*	Dikkuyruk/ White-headed duck		x	
3	Falconidae	*Falco cherrug*	Uludoğan/ Saker falcon		x	
4	Accipitridae	*Neophron percnopterus*	Küçük akbaba/ Egyptian eagle		x	
5	Accipitridae	*Aquila nipalensis*	Boskır kartalı/ Steppe eagle		x	
6	Podicipedidae	*Podiceps auritus*	Kulaklı batağan/ Horned grebe			x
7	Procellariidae	*Puffinus yelkouan*	Yelkovan/ Yelkouan shearwater			x
8	Anatidae	*Melanitta fusca*	Kadife ördek/ Velvet scoter			x
9	Columbidae	*Streptopelia turtur*	Üveyik/ Turtle dove			x
10	Pelecanidae	*Pelecanus crispus*	Tepeli pelikan/			x

No	Family	Name in Latin	Name in Turkish/ English	IUCN Danger Category		
				CR	EN	VU
			Dalmatian pelican			
11	Anatidae	*Anser erythropus*	Küçük sakarca/ Lesser white-fronted goose			x
12	Anatidae	*Branta ruficollis*	Sibirya kazı/ Red-breasted goose			x
13	Anatidae	*Mammaronetta angustirostris*	Yaz ördeği/ Marbled duck			x
14	Anatidae	*Aythya ferina*	Elmabaş patka/ Common pochard			x
15	Accipitridae	*Aquila heliaca*	Şah kartal/ Asian imperial eagle			x
16	Otididae	*Otis tarda*	Toy/ Great bustard			x
17	Acrocephalidae	*Acrocephalus paludicola*	Sarı kamışçın/ Aquatic warbler			x
18	Accipitridae	*Clanga clanga*	Büyük ormankartalı/ Greater spotted eagle			x

Table 4.3 Priority Reptilian Species for Protection in the Kızılırmak Delta

No	Family	Name in Latin	Name in Turkish/ English	IUCN Danger Category		
				CR	EN	VU
1	Testudunoidea	*Testudo graeca*	Tosbağa/ Common tortoise			x

Table 4.4 Priority Fish Species for Protection in the Kızılırmak Delta

No	Family	Name in Latin	Name in Turkish/ English	IUCN Danger Category		
				CR	EN	VU
1	Acipenseridae	*Acipenser gueldenstaedtii*	Rus Mersini/ Russian sturgeon	x		
2		*Acipenser nudiventris*	Şip Balığı/ Bastard sturgeon	x		
3		*Acipenser stellatus*	Sivrişka/ Star sturgeon	x		
4		*Huso huso*	Mersin Morinası/ European sturgeon	x		
5	Anguillidae	*Anguilla anguilla*	Yılan Balığı/ European eel	x		
6	Cyprinidae	*Cyprinus carpio*	Sazan/ Carp			x
7	Cyprinodontidae	*Aphanius dandordii*	Dişli Sazancık/ Sailton pupfish	x		

Given that the wetlands of the Kızılırmak Delta, as a Ramsar area, are a part of the ecological structure and the fishing activities have been going on for years in the area, fishery may not be ignored as an embodiment of the relationship between mankind and ecosystem. It is distinguished as a living, breeding, feeding, and protection area for many fish species such as sturgeon, eel, sailton pupfish, shad, etc. However, there is insufficient data about the structure, improvement, regression, threats, species, and size composition of the fish populations, trends over the years, and efficiency, number, etc. of the fishing instruments in the delta, which causes uncertainty about evaluating the impacts of fishing on the ecosystem and management of fishing, thus shortcomings and failures. Although there is not any structure that continuously prevents the entry of migratory species into the river or the lakes in the delta, it appears that there are problems about the advancement of sturgeons in particular within the Kızılırmak. Both the sills made in the main bed of the river for the purpose of flood control and absence of fish gateways in Derbent and Altınkaya Dam Reservoirs may prevent migration in the spring-river mouth-spring route. Hence, while sturgeons, shads, and eels (3 sturgeon species, 2 shad species, and European Eel) are encountered in the Black Sea on the coastal zone of the delta, no records were reported about these species at least in the section of Kızılırmak upto the outlet of Derbent Dam Reservoir. In addition, closing up of the canals or transitory water canals that connect the lakes to the sea at certain times to prevent ingress of water back from the sea or to avoid drop of the water level in the lake interrupts the connection of sea-fresh water and therefore passage of the fish and other aquatic creatures between the sea and fresh water.

The most important problem for the fishery in delta lakes are the impacts of the pool fish (Israeli carp in fisher's terminology), which was added to the habitat later. This species is known to adapt to ecological changes and unsuitable water quality conditions better than other species and to have a strong competition in terms of food, breeding, and feeding area of the fry. In purchasing points of Doğanca and Yörükler S.S. Aquaculture Products cooperatives, it was seen that about 75% of the hunt obtained by the fishers consisted of the pool fish, and the remaining 25% consisted of carp (*C. carpio*), grey mullet (*Mugil* sp.), and pike perch (*S. lucioperca*), which have commercial value. As stated by the fishers, majority of the hunted fish are females. Fishers do not want to hunt this species as it does not have any economical value, they have to put forth much effort to take the fish from the net, and waste time on it. These factors increase the power of invasion of the pool fish further. It is stated that the rudd (*Scardinus eryophtalmus*) species that was hunted in the delta lakes in previous years and which had an economical value have not been found on the nets any more after invasion of the pool fish.

4.1.2 Evaluations about the Qualitative

After consideration of the Kızılırmak Delta as a whole, a general evaluation is summarized in the following table. Accordingly, the outstanding universal values of the area were attempted to be set forth.

Naturality	The wetland ecosystem was evaluated by making a classification under categories of natural areas, partly impaired natural areas, and areas with lost naturalness. The Kızılırmak Delta is a "Natural Area" for accommodating various habitat types with the possibilities of food and breeding especially for birds, and for having a rich diversity of vegetation. However, with the impairment of the coastline due to serious reduction of alluvial take away because of dams and with exposure to human impact such as the reduction of water quality due to the use of fertilizers/ pesticides, it may be considered as a "Partly Impaired Natural Area" and with the opening of agricultural areas it may be considered as an "Area with Lost Naturalness".
Integrity	The delta has protected integrity of the natural area of the wetland ecosystem with a lake, lagoon, and river. However, the residential areas and human activities in the area cause disintegration of habitats.
Vulnerability	The critical species identified in the delta and the wetland ecosystem is vulnerable to the extent that it will be immediately influenced by both the actions of the mankind and natural processes such as the changes in the water regime, impairments of habitat, and climate change.
Biological Diversity	According to the IUCN criteria, 7 species in total identified as endangered are in "Critical-CR", 4 species are in "Endangered-EN", and 15 species are in "Vulnerable-VU" category. When evaluated at national level, 13 species in total are in "Critical-CR", 24 species are in "Endangered-EN", and 59 species are in "Vulnerable-VU" category.
Typicality	Intensity of the endemic species among the species of the Kızılırmak Delta increases the importance of the area. In addition, existence of the flooded forests located on the right shore indicates "typicality".
Aesthetics and Excellence	Exhibits an excellent integrity in aesthetic terms with its long dunal coastline, various habitat types, and rich diversity of species in harmony with these.
Forming a Natural Source	Has the capacity of "Forming a Natural Source" with the flora and fauna using the area for feeding, breeding, and as a shelter, along with the means of living it provides to the local people such as fishery, reed harvesting, and water buffalo raising on the wetland.

Habitats

According to their structures and physico-chemical properties, lakes form complex habitats around them, which might be listed as:

- Dunal Habitats (Embryo dune, coastal dune, constant dune, dune bush, coniferous juniper bush),
- Aquatic Habitats (Floating, floating with roots tied to earth, coastal marsh)
- Meadow – Marsh Habitat (Flooded meadow, halophyte meadow, barren marsh, plain meadow)
- Forest Habitats (Flooded forest, flooded bushes, broad-leaved forest)
- Temporary Habitats (Roadside habitat, segetal habitat, ruderal habitat).

Change of sea level

A rise of about 1 meter is expected in sea levels within next 100 years, to be induced by climate change. This rise in sea levels will first impact the coastal areas. The risen sea will advance towards the interior lands and impact the flooded forests, lakes, and reeds around them. The rise in sea levels might have an impact in two ways:

- Habitats getting submerged and diminished
- Desertification due to the rise of saltiness in ground water

The rise in sea levels due to climate change will not happen immediately but will occur progressively through years. In this case, as the process of the delta's being overflooded by the sea will progress at a slow pace, position of the existing habitat types will change as well, and probably reeds and forests will regress back to the further hinterland.

This transgression process may gain speed after unification of the lakes with the sea. Raising awareness of the local people should be considered, beginning from the places to be impacted by the rise in the first place. The right agricultural practices to be applied consciously and nature-friendly will minimize the damage to be suffered by the delta due to the rise of sea levels.

4.2. SOCIO-ECONOMIC EVALUATION

Existence of more than one protection status and therefore more than one public institutions being authorized in the Kızılırmak Delta cause confusion of powers in the area. With the impact of the protection status of the delta being constituted of protected areas of priority one, activities carried out in the area such as agriculture, stockbreeding, fishery, and hunting have been attempted to be solved sometimes through legal means and sometimes verbally. Just at this point, adaptation of the local people to the new structure to be formed with the re-setting

of the protected areas should be cared for. Accordingly, a common language should be formed with public entities and institutions.

The local people have a sense of belonging. Any person who has identified themselves with the area would have an improved sense of protection. However, there are shortcomings about what is included and excluded by the content of protection. Accordingly, awareness raising studies should be carried out without impairing the sense of belonging of the local people.

4.3 LEGAL AND ADMINISTRATIVE EVALUATION

There are Natural Protected Areas of Priority 1, 2, and 3, Wildlife Improvement Area, and Ramsar Site statuses within the Kızılırmak Delta for protection of the natural life. Considering the protection statuses and current uses of the area, there are many public entities and institutions in action. The main institutions are the Ministry of Environment and Urbanization, Ministry of Forestry and Water Affairs, Ministry of Agriculture and Livestock, Ministry of Culture and Tourism, and local units under these entities. In addition, district governor's offices, metropolitan municipalities, district municipalities, and town municipalities are in action in the area. As the area accommodates Natural Protected Areas of Priority 1, 2, and 3, the General Directorate for Protection of Natural Assets and the Ministry of Forestry and Water Affairs, being responsible for activities in the wetland and Ramsar site, may be considered as the most efficient authorities in management of the wetland.

In the Communiqué on the Procedures and Principles for Determining the Establishment and Duties of the Field Management and the Council of Monuments and Management Areas, as published in the Official Gazette dated 27.11.2005 and no. 26006, the 1st article titled as "Purpose" reads as: "The purpose of this communiqué is to regulate the procedures and principles for determining the duties, powers, and responsibilities of the advisory board, presidency of the area, coordination and supervision committee, the auditing unit, and the council of monuments that will take charge to provide protection and evaluation of ruins, protected areas, and interaction fields and connection points within framework of a sustainable management plan with coordination of the public entities and institutions and non-governmental organizations, to set and improve management areas, to prepare, approve, implement, and monitor the management plans, and to perform management of the area."

Within this context, for the purpose of providing sustainable management of the area, namely as the Wetland and Bird Paradise in the Kızılırmak Delta, enlisted in "UNESCO's World Heritage Tentative List" on 13th April 2016 in field of "Natural

Heritage”, Approval of the Ministry no. 10655 and dated 15.09.2017 approved establishment of the Presidency of Area and employment of one president of the area, an urban planner, a biologist, a geological engineer, an official, a secretary, a driver, and two nature protection attendants under such presidency.

Many species and their habitats in the area are directly related to the following international conventions:

- The United Nations Educational, Scientific, and Cultural Organization (UNESCO) Convention: Turkey was approved with the law no. 4895 and dated 20th May 1946. After this approval, in accordance with the 7th article of the UNESCO Constitution, Turkish National Commission for UNESCO, as the only and legal representative of the General Directorate of UNESCO, commenced its activities on 25th August 1949.
- Convention on Protection of Wetlands (RAMSAR): Turkey became a party to the convention in 1994. The Kızılırmak Delta was enlisted in the convention list on 15.04.1998, thus guaranteeing at international level that its ecological character will be protected in situ.
- Convention on the Conservation of European Wildlife and Natural Habitats (BERN): Turkey became a party to the convention in 1994. There are numerous species in the area, which are required to be protected according to the BERN Convention.
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

The laws listed below and current regulations for the implementation of these laws (regulation, circular, notification, notice, etc.) are the essential legislation concerning the area.

- National Parks Law no. 2873
- Land Hunting Law no. 4915
- Aquaculture Products Law no. 1380
- Law on Protection of Cultural and Natural Assets no. 2863
- Environment Law no. 2872
- Forestry Law no. 6831
- Pasture Law no. 4342

4.4 CULTURAL EVALUATION

One of the most ancient residential areas identified in the site is İkiztepe, located at 7 km beeline distance to the Black Sea, on the west of River Kızılırmak. It was found out that İkiztepe had been on the coast of the Black Sea when it had been first set up and had had a residential area in the ruins part for 2300 years from Late Chalcholithic Age to early Middle Bronze Age. During the first Bronze Age, the highest hill of the area was used as a cemetery. As one of the biggest cemeteries of the Ancient Anatolia, 623 graves and a mausoleum that dates back to the Hellenistic Era (330 B.C. – 30) were found in the site. In consequent with the archaeological studies carried out, it was found out that the then residents had lived on stockbreeding, hunting, and fisher.

After Hittites, the Phrygians, Cimmerians, Romans, Byzantines, Anatolian Seljuks, and the Ottoman State ruled the region chronologically. (Yeniyurt et al. 2008).

5. ZONING AND LAND USE DECISIONS

Yılkı Atları

5. ZONING AND LAND USE DECISIONS

Under the Project of Preparing a Management Plan for the Natural Protected Areas of the Wetland and Bird Paradise in the Kızılırmak Delta in Samsun, both the west and east side of the area were examined with the specialists and authorized persons of the entities on 20th-21st November 2017. Evaluations regarding any revision about the protection statuses and/or the current situation were carried out with the specialists and authorized persons on 22nd November 2017.
Under the Project of Preparing a Management Plan for the Natural Protected Areas of the Wetland and Bird Paradise in the Kızılırmak Delta in Samsun, the area was zoned into 3 different categories (1st Zone, 2nd Zone, and 3rd Zone) upon compilation of all the data.

While doing the zoning, the outcomes of the scientific study carried out in the area, current uses of the area, and the natural protected area borders suggested within context of the Ecocentric Scientific Research Project for the Natural Protected Areas of Samsun, Sinop, Amasya, Ordu, and Tokat Provinces, provided to be prepared by the General Directorate for Protection of Natural Assets were taken into account.

5.1. PROTECTED AREAS AND PLAN DECISIONS

The entirety of the Wetland and Bird Paradise in the Kızılırmak Delta is within limits of the natural protected area. Upon zoning, the area was divided into three categories as i) 1st Zone ii) 2nd Zone and iii) 3rd Zone, in compliance with the provisions of the “Regulations on the Principles and Procedures of Setting, Registering, and Approving the Protected Areas”, as published in the Official Gazette no. 28358, dated 19.07.2012, and the Decisions in Principle for the Conditions of Protection and Utilization of Natural Protected Areas, dated 05.01.2017 and no. 99.

- **First Zone**

The First Zone covers the parts of the area with the highest diversity of natural, historical, and cultural values, which are also the most vulnerable places against threats, where human actions will be highly restricted.

At present, fishery and cattle grazing, mostly water buffaloes, are the main activities carried out in this zone, where reed harvesting, bird watching, bird photography, training, research, and scientific studies are allowed within an area with defined borders.

The following principles were set forth through the Management Plan process, taking into consideration the characteristics and conditions specific to the area.

In the First Zone;

1. It is essential to maintain the ecological character of the area.
2. No activity is allowable, which might damage wildlife, cause disturbance, and impair the ecological relationships.
3. No waste and earthwork may be disposed into the region.
4. Fishing and casting a net, pulley, fyke net, etc. is not allowed at 500 metres distance to reeds and in canals connected to lakes or flow into the sea.
5. Principles concerning the use by visitors are described in the “Visitor Management Subplan”. Vehicle traffic is not allowed. Visitors may pay visits on routes under control to be determined by the presidency of the area, in a way not to exceed a certain capacity.
6. Wild life (bird, butterfly, plants, mammals, etc.) watching and photography and training, research, and monitoring activities will be performed upon information and permission of the Presidency of the Area, within framework of the limits and conditions to be set by the Presidency of the Area.
7. In places to be found appropriate by the Presidency of the Area, any kind of informative sign may be placed for the purpose of introducing the area and informing and warning the visitors and users of the area.
8. Maintenance and repair may be done in the infrastructure facilities within the zone.

With the appropriate decision of the Regional Commission of Natural Assets of Samsun and with permission of the Presidency of the Area, in this zone;

9. Walkways, piers, sustained bridges to provide passage of pedestrians over the canals, landscape viewing platforms/ terraces, bird watching towers, and observation platforms may be built and a camera system may be installed for security purposes and to monitor the wild life.
10. Water buffalo raising and fishing activities may be continued, provided to remain within capacities to be set.
11. A limited amount of reeds may be cut out, particularly for providing sustainability of the natural balance in the zone.
12. The zone may be surrounded by a fence to prevent and/or control entries into the zone.
13. No activity may be performed other than the above listed.

In addition, Decisions in Principle for the Conditions of Protection and Utilization of Natural Protected Areas in the Regulations on the Principles and Procedures of

Setting, Registering, and Approving the Protected Areas, as given below, are also valid in the First Zone, as the entirety of the area is a Natural Protected Area.

First zone are land, water, and sea areas where the use of area and all the impacts to the area will be limited, entrance to the site will be prevented when necessary, and that will be protected by taking special measures for the purpose of scientific researches, training, or environmental monitoring for the protection of source values, which are announced upon a Decision of the Council of Ministers, prohibited for construction, and that definitely need to be protected.

No action may be taken in these areas which might impair the flora, fauna, and their habitats, and topography and silhouette's impact, however with the permission of the Regional Commission of Protecting Natural Assets;

1. Out of the technical infrastructure facilities, sewerage system, drinking water line, natural gas lines, energy networks, and forest fire roads may be built where it is found compulsory by public and private institutions, although there is a definite prohibition of construction,
2. Any building might be constructed, which is compulsory for the safety and security of the state,
3. Maintenance and repair may be carried out with the existing infrastructure and superstructure facilities and buildings with a license or considered to be licensed,
4. Beekeeping may be carried out, provided not to construct a building.

- **Second Zone**

All areas out of the First and Third Zone are defined as the Second Zone. These areas are meadow areas with a relatively conserved natural character, natural forest remains within agricultural fields, forestation areas, and dunal ecosystems, though sometimes used by humans.

In the Second Zone;

1. It is essential to protect the ecological character of the area.
2. New agricultural sites may not be opened in the zone, other than the existing ones and no artificial fertilizers and pesticides may be used in agricultural sites.
3. No activity is allowed which might damage wildlife, cause disturbance, and impair ecological relationships.
4. No waste and earthwork may be disposed into the region.
5. Principles concerning the use by visitors are described in the "Visitor Management Subplan".

6. Wild life (bird, butterfly, plants, mammals, etc.) watching and photography and training, research, and monitoring activities will be performed upon information and permission of the Presidency of the Area.
7. Mining is not allowed in this zone. Stone quarry, sand quarry, and gravel pit may not be opened and run. For whatever reason, blasting is not allowed in any way.
8. Any kind of land hunting is banned in the zone.
9. Bovine or ovine animals may be grazed within areas with set borders in compliance with the grazing plan to be prepared.
10. Handling fishing is allowed, provided to be out of the first zone.
11. The lands under the rule and disposal of the government and properties owned by treasury may not be subject to sales and exchange in any way; where allotment will be possible for any activity to be found appropriate by the Ministry, Regional Commission for Protection of Cultural Assets of Samsun, and Regional Commission for Protection of Natural Assets of Samsun.
12. Necessary measures for protection against fire will be taken in forest areas by the concerning institutions.

With the appropriate decision of the Regional Commission of Natural Assets of Samsun and with permission of the Presidency of the Area, in this zone;

1. Along with the activities set for the areas in the First Zone, entry control units, management and visitor centres, and outbuildings (car park, cafeteria, cycle stand, souvenir sales units, children's playgrounds, etc.), country restaurant, training and research centre, toilets, fountain, and facilities for handline fishing may be done.
2. The trees are not allowed to be cut down and taken out of the forest in forest areas, including the ones felled due to snow and wind. Disease and pest control is admissible only in cases set forth through scientific reports.

Because the entirety of the areas identified as the Second Zone are Natural Protected Areas, Decisions in Principle for the Conditions of Protection and Utilization of Natural Protected Areas in the Regulations on the Principles and Procedures of Setting, Registering, and Approving the Protected Areas, as given below, are also valid in such areas.

Qualified Natural Protected Areas are defined as land, water, and sea areas with unchanged or little changed natural structure, not impacted by modern life and human actions to a great extent, predominated by natural processes, where traditional life styles dependent on nature are preserved by providing the residents

to use the present sources of the area in accordance with the purposes of protection.

These areas are sites where it is possible to carry out agricultural activities other than greenhouse agriculture, fishery other than aquaculture, and camping in the camp area, accommodation in bungalows, and daily activities in harmony with the natural structure of the area. For the continuity of the natural characteristics of the area, it is essential to keep access of people to these areas at a suitable level and manner.

The following were set forth for these areas;
1. Necessary fire protective measures will be taken by the concerning institutions,
2. No stone, soil, and sand will be taken out; no quarries such as lime, stone, brick, marble, sand, and mine will be opened; no soil, sinder, waste, earthwork, industrial waste, and similar substances will be casted; however for any enterprise which has obtained license before announcement of the decision of protected area, the personnel in charge will be rehabilitated by the site and works will be wound up within due legal period,
3. Any informative and warning signs will be placed for providing protection of these areas and any protective measures will be taken by the concerning institutions and local governments in these areas,
4. However, with permission of the Regional Commission for Protection of Natural Assets, the following will be feasible in these areas;

a) Activities listed for Vulnerable Areas to be Preserved Strictly may be carried out,
b) Fishing ports, watch houses, and wooden piers may be built,
c) Where inevitable, technical infrastructure services such as phone line, GSM base station, cable car, and chair lift may be established,
d) Practices such as conduction of natural spring water and drilling and conduction of geothermal spring water are feasible based on the views of the concerning ministries,
e) Any trees either fallen due to snow and wind, affected by natural disasters, sickened, or not of value may be cared for or removed,
f) Cutting out of trees and planting of local species may be allowed upon a technical report to be issued by the concerning institution, in order to provide care of forests and protecting the natural balance,
g) Any activities sourced from the character of the area may be continued based on the views of the concerning public entities and institutions for providing continuity of the natural balance.

- **Third Zone**

Areas with intensive agricultural fields, residential sites, and housing.

In the Third Zone;

1. It is not allowed to cast substances such as waste, sinder, earthwork, or industrial waste in this zone,
2. Any solid waste regular storage area, solid waste disposal facility, opening and running mines and quarries, announcing the site as an industrial site, establishing an organized industrial site and free zone industrial site is not allowed in this zone.
3. No quarries such as lime, stone, brick, marble, sand, and mine is allowed to be opened in this zone, where any existing mine (previously licensed to operate) will be closed after expiry of the permit, the mine and surroundings will be rehabilitated and recovered to nature within due legal period.
4. Wind turbines and solar energy production facilities are not allowed to be set up.
5. All traditional agricultural and stockbreeding activities will be carried out.
6. Good agriculture practices will be encouraged in this zone.

However, in these areas, along with the activities allowed in the First Zone and Second Zone, upon permission of the Regional Commission for Protection of Natural Assets of Samsun and concerning institutions;

7. Greenhouse agriculture, aquaculture, and integrated agricultural and stockbreeding activities may be carried out.
8. Provided not to be contradictory to the Regulations on the Principles and Procedures of Setting, Registering, and Approving the Protected Areas and Decisions in Principle and not to exceed the conditions set in the Environment Plan; in areas out of settlement and development in Environment Plans, the uses specified to be allowable without a subscaled development plan may be permitted by the Regional Commission for Protection of Natural Assets, in accordance with the terms of Environment Plan, taking the character of the site into account, without requirement to prepare a protective purpose development plan and to determine the principles of protection and conditions of use for the transition period.

In addition, as the entirety of the Third Zone remains within the natural protected area, Decisions in Principle for the Conditions of Protection and Utilization of Sustainable and Controlled Areas of Use in the Regulations on the Principles and Procedures of Setting, Registering, and Approving the Protected Areas are also valid. Sustainable and Controlled Areas of Use are areas that influence Vulnerable Areas to be Preserved Strictly or Qualified Natural Protected Areas, show integrity with these protected areas, which allow low intensity activities, tourism, and settlement in harmony in natural and cultural terms, which will contribute to protection.

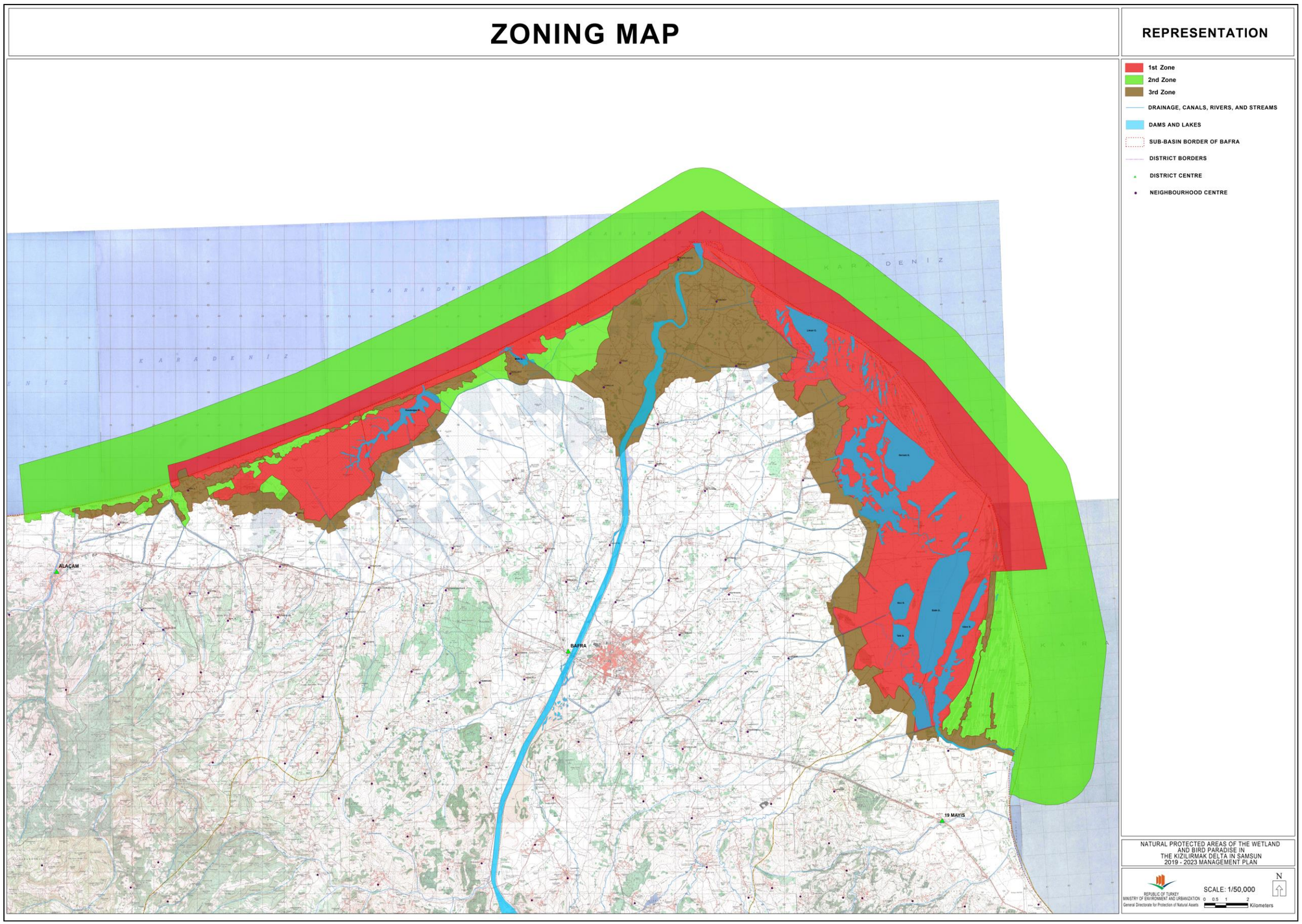


Figure 5.1. Zoning Map of Natural Protected Areas of Wetland and Bird Paradise in the Kızılırmak Delta

MANAGEMENT PLAN OF THE KIZILIRMAK DELTA FIRST 5-YEAR IMPLEMENTATION PERIOD

MANAGEMENT PLAN

FIRST 5-YEAR IMPLEMENTATION PERIOD

A. SUB-PLANS AND PLAN DECISIONS

A.1. Water Management

There are a number of big and small lakes and lagoons of all sizes in the delta. In spring, water level rises and almost all lakes unite to form a single lake in the delta with the melting of the snow and rains. In summer, water level drops with the reduction of rains and evaporation, where connection of lakes breaks.

In case that natural water regime cannot be supplied, negative impacts may be expected on the cover and diversity of vegetation. In the event that sufficient water cannot be supplied to the area during summer when evaporation is high, water is drawn from waterlogged pastures and marshes, salt in the lower layers of the earth moves upwards to upper layers, and the upper earth layer becomes salty. This causes alteration of the cover and diversity of vegetation and gets halophilic plants to become widespread. Halophilic plants becoming widespread reduce the yield of grass on pastures and have a negative impact on stockbreeding. It is considered that one of the reasons why the rush plant *(Juncus acutus)* has become widespread on pastures in recent years is the impairment of the water regime.

Water level has been regularly measured only in Lake Balık among the lakes in the delta since 1960s. Upon surveys in the area and literature review, it was observed that detailed studies are needed in the delta concerning water management. In line with this purpose, The Water Footprint Identification Project in the Kızılırmak Delta carried out Samsun Metropolitan Municipality is considered to yield important outputs and might provide guidance to water management processes. Besides, points to consider and general approaches in the area until an efficient water management approach is set forth in the area may be summarized as follows;

1. In order to manage the water regime of the area in a correct and efficient way to provide sustainability of wild life and habitats, following the management plan put into force, a team that constitutes of ecologists, limnologists, ornithologists, and hydrogeologists is required to make observation, examination, and research for at least two years, and the impacts of the water regime and quality on the area and the living things in the area, monthly water level values required to be in the area, and the water management necessary for ensuring these values should be set forth.

2. Until completion of the study mentioned in the 1st clause, the principle of fulfilling the 1 m water level throughout the year in the lakes of the delta identified in the management plan, as applied under Ramsar, and at this point, supply of water to the delta from clean water canals by DSİ, when necessary, should be continued to be exercised.
3. No additional canal may be opened in any way to unite lakes and lagoons together, other than their natural course of connection. It should be left to its natural flow. Sea connections should be able to be interfered if found necessary in any emergency such as a natural disaster or flood, upon permission and for a period to be determined by the Presidency of the Area.
4. No new drainage canal may be opened within the delta (especially within the area located in the first zone). The existing old canals within the first zone should not be interfered and any activity such as deepening, cleaning, or widening should not be permitted. No interference or construction should be allowed to supply water flow into the zoning canal in the first zone located on the north of the BDT1 and BDT2 zoning canals built by DSİ.
5. Exact practises and management decisions about water management shall be taken by the Presidency of the Area after completion of the monitoring and research studies to be carried out within 2 years' term (level, bathymetry map, evaporation, amount of rain, changes in the level of underground water, natural or artificial water discharge amounts from the delta, determination of the periods when the areas in the delta remain humid, wet, and filled with water, etc.).

A.2 Visitor Management

Being constituted of numerous lakes and lagoons in various sizes and with varying ecological characters and reeds and marshes surrounding these, water meadows, dune ecosystems, and alluvial flooded forests lessened in number across Europe, the Kızılırmak Delta accommodates a wild life of unique diversity. This richness of the delta increasingly drives the attention of the bird, plant, and butterfly watchers and photographers, who have increased in number in our country recently. The Kızılırmak Delta offers alternatives also for the ones who desire to have a day in solitude, away from the noise and chaos of the big city, such as walking, cycling, and fishing. Although the information in hand are not clear, it is known that the number of visitors have been increasing for the last few years, in parallel with the established infrastructure and efforts of publicity.

Like all wetland ecosystems, the Kızılırmak Delta, has the characteristic of an outdoor laboratory for educational and scientific studies.

The point that calls for the utmost care in the area is to prevent the visitors from causing pressure on the natural values of the area and damaging the flora and the fauna in return of the pleasure they get from the area.
For this purpose, an Area Visitor Management Plan should be prepared and implemented in an efficient way.

The following rules should be obeyed until preparation of the visitor management plan.

All access to the area should be taken under control. For this purpose, the controls should be increased at the entry of Doğanca and Yörükler neighbourhoods on the right shore of the delta and the area should be pedestrianized for 24 hours, where on the left shore, entry control units should be built in Habilli and Sahilkent neighbourhoods.

1. At entry control units, the records of the visitors should be taken, information should be provided about the area and the rules to be followed in the area, and they should be guided to introductory units.
2. The visitors should be provided information about the area and visitors should be guided in accordance with their expectations in the already present introductory unit in Doğanca neighbourhood on the right shore of the delta and in the introductory unit within the Administrative and Visitor Centre planned to be established for the visitors who will have access from the Yörükler side.
3. The set up walking tracks, piers, and walk routes may be closed to access of visitors for a given period at critical periods (breeding periods, feeding times, etc.) for animals, mainly the birds.
4. Private vehicles should not be allowed into the area, except for exceptional situations. Transportation will be provided within the area through the ring system by electrical vehicles, as far as possible, and by bicycles or on foot.
5. On the right shore, transportation between the entry of Yörükler and the entry of Doğanca will be provided by vehicles that run by the ring system. There must be an area guide in the ring system vehicles. Bike renting possibility should be provided at points of entry for any visitor who desires to.
6. Area guides should successfully complete the guide’s training to be given by the Presidency of the Area and get a certificate.
7. For any research, examination, and scientific study to be carried out by domestic or foreign researchers, who got a research permit from the concerning ministries, within the borders of the protected area, it is compulsory for them to get the permission of the Presidency of the Area and submit a copy of the study report to the Presidency. When necessary,

the researchers employed in the Presidency of the Area or the persons in charge from the concerning departments of university may accompany the researchers.

8. In order to control entry of the local people permitted to perform their traditional activities in the area, and photographers, researchers, specialists/ researchers employed in the ornithology centre, and other staff employed in the area when required, within the knowledge of the Presidency of the Area, an entrance card will be issued and updated annually by the Presidency of the Area.

One of the ideal objectives of the Management Plan of the Kızılırmak Delta is to contribute to raising individuals who have an understanding of nature, are respectful to the nature and feel responsibility for protection.

The group with highest priority targeted by this objective is students. During the five year implementation period, it is projected to “Raise awareness of at least 500 students who study in the primary schools and high schools in Merkez, Bafra, and Alaçam districts in Samsun about the Kızılırmak Delta and its natural values every year”. For the attainment of this purpose, education programs should be developed for various student groups and implemented in cooperation with the Provincial Directorate of National Education of Samsun.

While training the students in the area, student groups should not exceed 20 in number. Along with the teacher, an educator to be appointed by the Presidency of the Area should accompany education activities for each group of 20 students (to control the student group and increase success in education).

9. Apart from exceptional situations, researches, examinations, and scientific studies within knowledge of the Presidency of the Area and people will not be allowed in lakes and lagoons, reeds, and other vulnerable areas during the breeding period of birds, except for security and area protection reasons.
10. Beside visitor management, the 1st zone will be surrounded with a suitable fence to begin from the right shore first, in order to provide efficient protection and security of the area.
11. In order to provide an efficient visitor management in the area, the Security and Control Unit suggested in the Area Management Organizational Chart should be established and the officials (entrance control officials and travelling control officials) should be appointed.

A.3. Grazing Management

The second most important means of living of the people in the delta after agriculture is stockbreeding. Stockbreeding is generally carried out in villages around the wetland. The Kızılırmak Delta is the place with the highest population of water buffaloes in our country. The number of water buffaloes which was 10.272 in 1990 reduced to 2.173 in 2010, which number swiftly increased and raised upto 11.266 in 2017 with the increase of the incentives provided by the government for the improvement of water buffalo raising. However, there is no information about how many of these graze in the delta throughout the year.

After water buffaloes, sheep are the second most crowded group of animals that graze in the delta. There are 9-10 sheep folds in the delta, which belong to the residents of the Yeşilyazı Neighbourhood. There is not any study carried out concerning the number of sheep that graze in the delta and their impact on the area.

1. First of all, the quantity of bovine animals (water buffaloes and other cattle), jades, and ovine animals that graze in the delta, in what regions of the delta they graze, and their impacts on the area and other utilizations of the area should be examined.
2. Evaluating the data obtained in the 1st clause, a grazing plan should be made to identify the areas of the delta where grazing is possible, the species and quantity of the animals to be grazed in these areas, grazing system, and grazing times.
3. The sheep folds located around Lake Liman should be taken out of the 1st zone and grazing in the area should be done on the region that is between the Boytar Canal and Lake Liman.

A.4. Aquaculture Management

Fishing has been carried out in a number of lakes and lagoons of all sizes in the delta for hundreds of years. According to the “Identification of Water Footprint in the Kızılırmak Delta” project carried out in 2017, it is specified that about 75% of the pool fish (*Carassius gibelio*) hunted by Doğanca and Yörükler S.S. Aquaculture Products cooperatives in 2017 and the remaining 25% consists of carp (*Cyprinus carpio*), grey mullet *(Mugil* sp.*)*, and pike perch (*Sander lucioperca*) with commercial value. Due to the crayfish disease seen in the middle of 1980s, crayfish (*Astacus leptodactylus*) has almost been extinct.

Other important Aquaculture Products in the delta are leech and frog. The Kızılırmak Delta is one of the places in our country where medicinal leech

collecting is most widespread. Although it is forbidden to collect leech between dates 01st March and 30th June, leech has been collected from the delta in May, June, and July since the early 1990s. It is claimed that about 3 tons of leeches are collected every year.

Literature review reveals no sound and reliable data about Aquaculture Products, including fishery. Therefore, first of all, the current fish species in the delta and the reasons that affect the changes in size of population should be searched for, the current problems and suggestions of solutions should be evaluated to prepare an aquaculture products management plan should be prepared, which will cover the control of invasive species and improvement of any extinct or reduced fish stocks and which will make sustainability of fishery reliable.

1. Collection of leeches, frogs, and snails should not be allowed in the protected area not only due to insufficient data about the populations of leeches, frogs, and snails but also because a section of the collection period (June and July) overlapses with the breeding period of birds, taking into account any disturbance that might be given to breeding birds.
2. Audits for preventing illegal collecting and fishing should be increased and necessary warnings should be given.
3. Fishing and casting a net, pulley, fyke net, etc. is not allowed at 150 metres distance to reeds and in canals connected to lakes or flow into the sea. According to these criteria, the appropriate areas will be marked on maps, which will be handed to concerning cooperatives, and the members of cooperatives will be provided to comply with this.
4. Unused nets and fyke nets may not be left in lakes, as this causes both wading waterfowls and turtles get entangled into these nets and die. Especially in the fyke nets forgotten in lakes, it is seen that many turtles die. These will be collected away in cooperation with fishing cooperatives.
5. Traditional fishing activities will be carried out only in lakes Karaboğaz, Liman, Cernek, Balık, Gıcı, and Tatlı in the delta. Apart from these, fishing activities will be allowed in any way in areas such as Uzungöl, Lake Altınlı, Lake Mülk, Lake Sülüklü, which dry out in certain seasons and become feeding sites of fish and particularly birds in rainy seasons as they are shallower, which have the character of an area of reeds and rushes. Entrance to and casting net or pulley into these areas will not be allowed.
6. In order to provide sustainability of traditional fishing activities, provide control, and prevent illegal hunting, cooperative members in number to be fixed by the Presidency of the Area will be permitted, and their hunting period, properties and quantity of the nets to be used, landing points where the boats will be moored will be identified and all similar arrangements will be performed by the Presidency of the Area.

7. No boat (or another vehicle used for moving on water) will be allowed in canals and natural streams within the protected area or in the site that impacts this area, other than the fishing boats of the permitted cooperative members.
8. Along with taking necessary actions to ensure that carried out fishing activities are in a capacity and form not to impair the natural balance, active participation of aquaculture products cooperatives will be provided especially in fighting invasive species such as the pool fish.
9. Subjects such as the practice, term, place, and permissible capacity, etc. for sports purpose handline fishing in the area will be planned by the Presidency of the Area, and applied if desired.

B. MANAGEMENT OBJECTIVES AND ACTIVITIES

The Management Plan for the Natural Protected Areas of the Wetland and Bird Paradise in the Kızılırmak Delta includes;

- **5 Ideal Objectives**
- **17 Implementation Objectives**
- **43 Activities.**

THE VISION OF THE MANAGEMENT PLAN FOR THE NATURAL PROTECTED AREAS OF THE WETLAND AND BIRD PARADISE IN THE KIZILIRMAK DELTA: TO PROVIDE MANAGEMENT THROUGH WHICH THE SOURCE VALUES OF THE AREA ARE PROTECTED EFFICIENTLY, SUSTAINABLE USE OF THE SERVICES AND PRODUCTS OF THE WETLAND IS PROVIDED, THE SOCIO-ECONOMIC ACTIVITIES IN THE AREA ARE DEVELOPED AND REMAINED IN HARMONY WITH THESE VALUES, ALL STAKEHOLDERS EFFICIENTLY PARTICIPATE IN DECISION-TAKING PROCESSES AND UNDERTAKE LIABILITY, AND WHICH MIGHT SET AN EXAMPLE TO SIMILAR AREAS.

IDEAL OBJECTIVES

IDEAL OBJECTIVE 1. SETTING UP OF TECHNICAL, ADMINISTRATIVE, AND EQUIPMENTAL MANAGEMENT STRUCTURE NECESSARY FOR THE EFFICIENT MANAGEMENT OF THE KIZILIRMAK DELTA

IDEAL OBJECTIVE 2: PROTECTION AND RESTORATION OF THE VULNERABLE HABITATS IN THE DELTA *(LAKES, LAGOONS, REEDS, WET PASTURES, DUNES, ETC.)* AND BIODIVERSITY ASSOCIATED WITH THESE

IDEAL OBJECTIVE 3: ENSURING CARRYING OUT OF SOCIO-ECONOMIC ACTIVITIES SUCH AS AGRICULTURE, STOCKBREEDING, FISHERY, AND NATURE TOURISM IN A WAY TO PRESERVE BIODIVERSITY AND IN HARMONY WITH THE AREA

IDEAL OBJECTIVE 4: CONTRIBUTING TO RAISING UP OF INDIVIDUALS WITH AN UNDERSTANDING OF NATURE, RESPECTFUL TO THE NATURE, AND FEEL RESPONSIBILITY FOR PROTECTION

IDEAL OBJECTIVE 5: PROVIDING AN EFFICIENT PARTICIPATION TO DECISION-MAKING AND IMPLEMENTATION PROCESSES

ACTION PLAN

The Vision of the Management Plan for the Natural Protected Areas of the Wetland and Bird Paradise in the Kızılırmak Delta: To provide management through which the source values of the area are protected efficiently, sustainable use of the services and products of the wetland is provided, the socio-economic activities in the area are developed and remained in harmony with these values, all stakeholders efficiently participate in decision-taking processes and undertake liability, and which might set an example to similar areas.

Ideal Objective 1: Setting up of technical, administrative, and equipmental management structure necessary for the efficient management of the Kızılırmak Delta		
U.H.1.1. Arranging the technical organization to be capable of providing services in accordance with the plan objectives by the end of 2020		
Actions	**When**	**Responsible Organization**
Action 1.1.1. To build entrance control units at the east and west entrances of Lake Karaboğaz.	By the end of 2021	General Directorate of Nature Conservation-Research and Registration Department Provincial Directorate of Environment and Urbanization, Presidency of the Area, SAMKUŞ
Action 1.1.2. To set up security cameras in the area.	By the end of 2020	SAMKUŞ, Presidency of the Area
U.H.1.2. Arranging the administrative organization to be capable of providing services in accordance with the plan objectives throughout the 5 years implementation period of the Management Plan		
Actions	**When**	**Responsible Organization**
Action 1.2.1. Appointment of the personnel projected in the "Presidency of the Area" Organizational Chart of the Kızılırmak Delta.	In 2019	General Directorate of Nature Conservation-Research and Registration Department
Action 1.2.2. To organize training programs to raise the capacity of the staff employed in the Presidency of the Area in the Kızılırmak Delta, in accordance with their job definition.	Continuously during the management plan implementation period	General Directorate of Nature Conservation-Research and Registration Department

Ideal Objective 2: Protection and restoration of the vulnerable habitats in the delta *(lakes, lagoons, reeds, wet pastures, dunes, etc.)* and biodiversity associated with these		
U.H. 2.1. Management of the water regime in accordance with its natural course during and after the 5 year implementation period of the Management Plan		
Actions	**When**	**Responsible Organization**
Action 2.1.1. To prepare the "Water Management Plan of the Kızılırmak Delta" which covers seasonal minimum and maximum water level values and the amount of water required to be supplied to the delta (in dry and rainy season).	Years 2021-2022	General Directorate of Nature Conservation-Research and Registration Department
Action 2.1.2. Regular and periodical measurement of the water levels of lakes and lagoons, follow-up of the moistness-wetness situation in areas such as wet pastures, marshes, etc., which involves a high amount of liveliness and source of life (where birds feed the most)	Installation of sliding scale (water level meter) will be completed in 2019 and continuous and regular records will be taken.	7th Regional Directorate of DSİ
Action 2.1.3. To prepare the depth maps of the lakes and lagoons in the delta.	In 2021	General Directorate of Nature Conservation-Research and Registration Department
U.H. 2.2. Fulfilment of the standard values of "Regulations on Surface Water Quality Management" in lakes and lagoons as of the end of 2022		
Actions	**When**	**Responsible Organization**
Action 2.2.1. To determine the impacts of the existing settlements and enterprises in the basin of the Kızılırmak Delta in terms of water pollution.	After approval of the MP	Samsun Metropolitan Municipality General Directorate of SASKİ, Provincial Directorate of Environment and Urbanization of Samsun
Action 2.2.2. To provide disposal of all the institutions and facilities under the Environmental Auditing Legislation in the basin of the Kızılırmak Delta, inspecting their compliance with all the legislations about wastes	Every year throughout the implementation of the Water Plan	Provincial Directorate of Environment and Urbanization of Samsun, Branch Directorate of Environmental Management
Action 2.2.3. To give training in settlements related with the delta on pest control and the use of pesticides and chemical fertilizers.	Ever year, continuously and regularly	Provincial Directorate of Food, Agriculture, and Livestock of Samsun
Action 2.2.4. To provide the control of package wastes of pesticides.	To begin in 2019 and be continuous	Samsun Governor's Office

Action 2.2.5. To monitor water quality (pH, saltiness, electrical conductivity, chemical oxygen demand, ÇÖ, suspended solid, chlorophile a, total nitrogen, total phosphor, pesticide values) by season in lakes and lagoons and in streams and canals feeding them.	Every month, continuously	7th Regional Directorate of DSİ, Presidency of the Area
U.H. 2.3 Prevention of the coastal erosion (loss) at the mouth of Kızılırmak throughout the 5 year implementation period of the Management Plan		
Actions	**When**	**Responsible Organization**
Action 2.3.1. To have a "coastal erosion prevention project" carried out, also taking into account the existing coastal erosion prevention structures.	Within 1 year following the approval of the plan	9th Zone Directorate of the Ministry of Transport, Maritime, and Communications
Action 2.3.2. To implement the coastal erosion prevention project.	In years 2020-2023	7th Regional Directorate of DSİ, Presidency of the Area
U.H. 2.4. Protection and providing sustainability of the natural habitats in the delta during and after the 5 year implementation period of the Management Plan		
Actions	**When**	**Responsible Organization**
Action 2.4.1. To identify the existing natural habitats in the protected area by satellite image or aerial photo and marking the same on the map.	Following the approval of the management plan	General Directorate of Nature Conservation-Research and Registration Department
Action 2.4.2. To provide information about the protection statuses in the delta and the legal situations of these statuses.	Following the approval of the management plan	Presidency of the Area, Provincial Directorate of Environment and Urbanization of Samsun
U.H. 2.5. Protection and providing sustainability of the Galeriç Forest during and after the 5 year implementation period of the Management Plan		
Actions	**When**	**Responsible Organization**
Action 2.5.1. To place warning and informative signs in the Galeriç Forest.	In 2019	Presidency of the Area
Action 2.5.2. To have a research done for the continuation of the flooded forest character of the Galeriç Forest.	In years 2019-2022	General Directorate of Nature Conservation-Research and Registration Department

U.H. 2.6. Protection and providing sustainability of the bird populations that breed as a colony on the tree in the delta during and after the 5 year implementation period of the Management Plan		
Actions	**When**	**Responsible Organization**
Action 2.6.1. To count the egret and stork colonies regularly during breeding periods.	During the breeding period every year as of 2019	OMU Ornithology Centre
Action 2.6.2. To place warning and informative signs in places that accommodate egret and stork colonies.	In 2019	SAMKUŞ, General Directorate of Nature Conservation-Research and Registration Department
Action 2.6.3. To carry out activities to raise awareness of the local people.	As of 2019	Presidency of the Area General Directorate of Nature Conservation-Research and Registration Department
U.H. 2.7. Protection, improvement and providing sustainability of the crane (*Grus grus*) and Dalmatian Pelican (*Pelecanus cripus*) population which breed in the delta throughout the 5 year implementation period of the Management Plan		
Actions	**When**	**Responsible Organization**
Action 2.7.1. To identify and map the breeding and feeding areas of the Crane (*Grus grus*) and Dalmatian Pelican (*Pelecanus cripus*) in the delta.	2019-2022	General Directorate of Nature Conservation-Research and Registration Department Presidency of the Area
Action 2.7.2. To prevent entrance of people in breeding areas during breeding periods.	Continuously and regularly during the implementation period of the Management Plan	Presidency of the Area, Provincial Directorate of Environment and Urbanization of Samsun
Action 2.7.3. To watch and record the crane and Dalmatian pelican populations that breed, overwinter, and accommodate during migration in the area.	Throughout the year and regularly as of 2019-2022	General Directorate of Nature Conservation-Research and Registration Department Presidency of the Area
U.H. 2.8. Protection of the bird species that use the delta for breeding, overwintering, and migration during and after the 5 year implementation period of the Management Plan		
Actions	**When**	**Responsible Organization**
Action 2.8.1. To make and record midwinter waterfowl counting (MWWC) regularly in the delta every year.	Every year during the implementation period of the Management Plan	General Directorate of Nature Conservation-Research and Registration Department

Action 2.8.2. To have a brochure prepared concerning the benefits of the birds and to carry out studies in primary schools in Samsun to raise awareness.	In 2020	Presidency of the Area, General Directorate of Nature Conservation-Research and Registration Department
U.H. 2.9. Providing continuation of existence of the *(Rhaponticum serratuloides, Ambrosia maritima, Pancratium maritimum, Jurinea kilaea, Galanthus rizehensis, Leucojum aestivum ve Thelypteris palustris)* plant species in their clustered range within the delta, which have priority of protection, during and after the 5 year implementation period of the Management Plan		
Actions	**When**	**Responsible Organization**
Action 2.9.1. To form monitoring parcels and to monitor the plant species with priority of protection in their clustered ranges.	Continuously and regularly as of 2019	Presidency of the Area, General Directorate of Nature Conservation-Research and Registration Department
Action 2.9.2. To make and distribute brochures, posters, signs, and promotional products concerning the plant species with priority of protection	To be issued annually between years 2019 and 2022 and will be continuous	Presidency of the Area, General Directorate of Nature Conservation-Research and Registration Department
Ideal Objective 3: Ensuring carrying out of socio-economic activities such as agriculture, stockbreeding, fishery, and nature tourism in a way to preserve biodiversity and in harmony with the area		
U.H. 3.1. Realization of sustainable fishery practices during the 5 year implementation period of the Management Plan		
Actions	**When**	**Responsible Organization**
Action 3.1.1. To carry out a comprehensive research to identify the current diversity of fish and the fish stocks in the delta, to set forth the problems, and to suggest solutions.	Between 2019 and 2021	General Directorate of Nature Conservation-Research and Registration Department
Action 3.1.2. To develop solutions to take the pool fish (*Carasius* sp.) under control.	In 2020	Provincial Directorate of Food, Agriculture, and Livestock of Samsun, Presidency of the Area, SAMKUŞ, concerning departments of universities
U.H. 3.2. Providing sustainability of traditional water buffalo raising activities during the 5 year implementation period of the Management Plan		
Actions	**When**	**Responsible Organization**
Action 3.2.1. To develop a strategy for the introduction of the water buffaloes and for making it a symbol as a socio-cultural value of the Kızılırmak Delta.	During the implementation period of the management plan	Presidency of the Area, Bafra Municipality, Union of Water Buffalo Raisers of Bafra
Action 3.2.2. To ensure improvement is done in water buffaloes	To be determined in the work plan	Turkish Ministry of Food, Agriculture, and Livestock, TAGEM

U.H. 3.3. Determination of the impact of grazing on the wild life by the end of 2021		
Actions	**When**	**Responsible Organization**
Action 3.3.1. To evaluate the impacts of grazing on the wild life.	After approval of the Management Plan	General Directorate of Nature Conservation-Research and Registration Department Presidency of the Area, Union for Protection and Development of the Kızılırmak Delta in Samsun (SAMKUŞ)
Action 3.3.2. To prepare the grazing plan for the natural protected area of the Kızılırmak Delta.	2019-2022	General Directorate of Nature Conservation-Research and Registration Department Presidency of the Area, SAMKUŞ
U.H. 3.4. Providing an efficient visitor management as of the end of 2019		
Actions	**When**	**Responsible Organization**
Action 3.4.1. To have the "Visitor Management Plan" prepared after evaluating the physical capacity, ecological capacity (tolerance degree of various areas to human interaction), and social bearing capacity (visitors' expectations).	Continuously and regularly as of 2019	Presidency of the Area, General Directorate of Nature Conservation-Research and Registration Department
IDEAL OBJECTIVE-4: CONTRIBUTING TO RAISING UP OF INDIVIDUALS WITH AN UNDERSTANDING OF NATURE, RESPECTFUL TO THE NATURE, AND FEEL RESPONSIBILITY FOR PROTECTION		
U.H. 4.1. Raising awareness of at least 500 students who study in the primary schools in Merkez, Bafra, and Alaçam districts in Samsun about the Kızılırmak Delta and its natural values every year		
Actions	**When**	**Responsible Organization**
Action 4.1.1. To develop education programs for various student groups, to prepare educational materials, and to implement the education program in cooperation with provincial and district directorates of national education.	Education program will be prepared in 2020, training sessions will take place according to the education program in the following years	Presidency of the Area
Action 4.1.2. To organize contests (painting, poetry, composition) among schools on the topic "The Kızılırmak Delta" within scope of the World Wetlands Day activities.	Continuously and regularly as of 2019	Presidency of the Area, SAMKUŞ

Action 4.1.3. To issue printed materials (puzzle, sticker, colouring book, etc.) for the primary school students, which are aimed to introduce the values of the area, and to distribute the same in the schools of the locality.	2019-2022	General Directorate of Nature Conservation-Research and Registration Department
Action 4.1.4. To give training on bird watching to primary school students.	Continuously and regularly as of 2019	General Directorate of Nature Conservation-Research and Registration Department
Action 4.1.5. To prepare bird watching books for children.	Throughout the process of the Management Plan	General Directorate of Nature Conservation-Research and Registration Department
Ideal Objective 5: Providing an efficient participation to decision-making and implementation processes		
U.H. 5.1. Monitoring and evaluation of the practices in a participant manner during the 5 year implementation period of the Management Plan		
Actions	**When**	**Responsible Organization**
Action 5.1.1. To evaluate implementation of the management plan in three monthly periods, through the Coordination and Auditing Committee.	Continuously for once in a three months as of the management plan's coming into force	Presidency of the Area
Action 5.1.2. To annually evaluate the practices of the management plan and make the implementation plan for the next year.	In December every year as of 2019	Presidency of the Area
Action 5.1.3. To evaluate practices of five year management plan and make the implementation plan for the 2023-2027 term.	In 2023	Presidency of the Area

ACTIVITIES AND ACTIVITY PLANS

IDEAL OBJECTIVE-1: SETTING UP OF TECHNICAL, ADMINISTRATIVE, AND EQUIPMENTAL MANAGEMENT STRUCTURE NECESSARY FOR THE EFFICIENT MANAGEMENT OF THE KIZILIRMAK DELTA	
U.H. 1.1. Arranging the technical organization to be capable of providing services in accordance with the plan objectives by the end of 2020	
Name of the Activity	**Activity 1.1.1.** To build entrance control units at the east and west entrances of Lake Karaboğaz.
Responsible institution or organization	General Directorate of Nature Conservation-Research and Registration Department Provincial Directorate of Environment and Urbanization, Presidency of the Area, SAMKUŞ
Institutions, organizations, or persons to be consulted to / cooperated with	Samsun Branch Office of the XIth Regional Directorate of Turkish Ministry of Forestry and Water Affairs, Samsun Metropolitan Municipality
Where	On the east and west entrances of Lake Karaboğaz
When and how often?	By the end of 2021
How?	• The locations of the entrance control units to be built in the first half of 2019 will be determined by General Directorate of Nature Conservation-Research and Registration Department Presidency of the Area, and SAMKUŞ personnel. • Provincial Directorate of Environment and Urbanization will prepare/ have prepared implementation and architectural projects for the activity and permit and approval procedures of the project will be completed in 2019. • General Directorate for Protection of Natural Assets will propose the performance of the project to the investment program of 2020 of the Ministry of Environment and Urbanization. • If required source is allotted in the investment program of 2020, the project will be performed. • Samsun Metropolitan Municipality and Presidency of the Area will provide support at each stage of the project, when necessary.
Personnel, equipment, cost	To be described in the project.
Institutions and organizations to get approval / permission from	Regional Commission of Samsun for Protection of Natural Assets

Name of the Activity	**Activity 1.1.2.** To set up security cameras in the area.
Responsible institution or organization	General Directorate of Nature Conservation-Research and Registration Department
Institutions, organizations, or persons to be consulted to / cooperated with	SAMKUŞ, Presidency of the Area
Where	On the right and left shore of the Kızılırmak Delta
When and how often?	By the end of 2020
How?	• General Directorate of Nature Conservation-Research and Registration Department, Presidency of the Area, and SAMKUŞ personnel determine the locations and numbers of the security cameras to be placed in the area in the first half of 2019. • Permission and approval procedures for the project will be completed in 2019. • The purchase and placement of the security cameras in the area will be proposed by General Directorate for Protection of Natural Assets for the investment program of 2020 of the Ministry of Environment and Urbanization. • If required source is allotted in the investment program of 2020, the work will be carried out by the way of service procurement.
Personnel, equipment, cost	
Institutions and organizations to get approval / permission from	

U.H. 1.2. Arranging the administrative organization to be capable of providing services in accordance with the plan objectives throughout the 5 years implementation period of the Management Plan	
Name of the Activity	**Activity 1.2.1.** Appointment of the personnel projected in the "Presidency of the Area" Organizational Chart of the Kızılırmak Delta.
Responsible institution or organization	General Directorate of Nature Conservation-Research and Registration Department
Institutions, organizations, or persons to be consulted to / cooperated with	-
Where	In the Kızılırmak Delta
When and how often?	In 2019
How?	• General Directorate of Nature Conservation-Research and Registration Department will be provided to employ 1 field presenter, 1 city planner, 1 geology engineer, 1 secretary, 1 biologist, 1 civil servant, 1 driver and 2 nature conservation officers. The staff to be employed will be appointed by General Directorate of Nature Conservation-Research and Registration Department.
Personnel, equipment, cost	Costs for the employment of the personnel of the Presidency of the Area
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 1.2.2.** To organize training programs to raise the capacity of the staff employed in the Presidency of the Area in the Kızılırmak Delta, in accordance with their job definition.
Responsible institution or organization	General Directorate of Nature Conservation-Research and Registration Department
Institutions, organizations, or persons to be consulted to / cooperated with	Presidency of the Area, Concerning Departments of Universities and NGOs, General Directorate for Protection of Natural Assets, Provincial Directorate of Environment and Urbanization of Samsun
Where	In the management centre
When and how often?	Continuously during the implementation period of the Management Plan
How?	• In 2020, General Directorate of Nature Conservation-Research and Registration Department will determine the education topics in cooperation with the Concerning Departments of Universities and Presidency of the Area and the education programs will be developed thereby. • Education programs will be organized under at least five main titles, such as the Kızılırmak Delta, wild life and watching, public relations and visitor satisfaction, area guidance, etc., where these programs will be addressed and applied to various target groups, and successful applications at home and abroad will be reviewed, etc. • Procurement of educators and education costs will be covered by General Directorate of Nature Conservation-Research and Registration Department.
Personnel, equipment, cost	Educators, educational material, implementation costs of education programs
Institutions and organizations to get approval / permission from	

IDEAL OBJECTIVE-2: PROTECTION AND RESTORATION OF THE VULNERABLE HABITATS IN THE DELTA (LAKES, LAGOONS, REEDS, WET PASTURES, DUNES, ETC.) AND BIODIVERSITY ASSOCIATED WITH THESE	
U.H. 2.1. Management of the water regime in accordance with its natural course during and after the 5 year implementation period of the Management Plan	
Name of the Activity	**Activity 2.1.1.** To prepare the "Water Management Plan of the Kızılırmak Delta" which covers seasonal minimum and maximum water level values and the amount of water required to be supplied to the delta (in dry and rainy season).
Responsible institution or organization	General Directorate of Nature Conservation-Research and Registration Department
Institutions, organizations, or persons to be consulted to / cooperated with	General Directorate of Water Management, 7th Regional Directorate of DSİ, Provincial Directorate of Environment and Urbanization, Samsun Branch Office of the XIth Regional Directorate of Turkish Ministry of Forestry and Water Affairs, Presidency of the Area
Where	In underground and surface waters in the Kızılırmak Delta
When and how often?	Years 2021-2022
How?	• Observation, review, and research will be carried out for at least two years by a team which consists of at least ecologists, limnologists, ornithologists, and hydrogeologists to prepare the "Water Management Plan of the Kızılırmak Delta" which sets forth the impacts of the water regime and quality on the living things that live in the general ecosystem and the area, the monthly water level values required to be in the area, the amount of water required to be supplied to the area for the fulfilment of these values, and from where and how to procure this water. • The work will be carried out by the way of service procurement. • The work will be completed by the end of 2022. • The budget of the work will be covered by General Directorate of Nature Conservation-Research and Registration Department.
Personnel, equipment, cost	Consultancy fees of specialists, travel costs to and from the area (project budget)
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 2.1.2.** Regular and periodical measurement of the water levels of lakes and lagoons, follow-up of the moistness-wetness situation in areas such as wet pastures, marshes, etc., which involves a high amount of liveliness and source of life (where birds feed the most)
Responsible institution or organization	7th Regional Directorate of DSİ
Institutions, organizations, or persons to be consulted to / cooperated with	Presidency of the Area, General Directorate of Water Management, Concerning Departments of Universities
Where	In all the lakes and lagoons of the Kızılırmak Delta
When and how often?	Installation of sliding scale (water level meter) will be completed in 2019 and continuous and regular records will be taken.
How?	• Water level has been regularly measured in Lake Balık since 1960. Records are kept monthly by DSİ. Water levels are automatically recorded with level meters placed in lakes Cernek and Karaboğaz in 2015. At current situation, level measurement is not taken in Lake Liman. Since Lake Liman is independent from other lakes, it is required to be measured individually. For this purpose, water level values will be taken in 2019 by placing a level meter also in Lake Liman.
Personnel, equipment, cost	Cost of the sliding scale (water level meter) device and installing the same in the lakes
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 2.1.3.** To prepare the depth maps of the lakes and lagoons in the delta.
Responsible institution or organization	General Directorate of Nature Conservation-Research and Registration Department
Institutions, organizations, or persons to be consulted to / cooperated with	Aquaculture Products Cooperatives, General Directorate of Water Management, Presidency of the Area
Where	In all the lakes and lagoons of the Kızılırmak Delta
When and how often?	In 2021
How?	• Depth measurements will be taken in the lakes and lagoons in the area with a suitable method. • The values that come out of the measurements taken will be recorded by coordinates. • The depth maps of lakes will be created with the gathered data by using Geographical Information Systems. • The boat to be used for measurement will be provided by Aquaculture Products Cooperatives. • Measurements and preparations of depth maps will be performed by the personnel of Presidency of the Area.
Personnel, equipment, cost	Suitable staff and equipment will be supplied according to the method to be applied.
Institutions and organizations to get approval / permission from	

U.H. 2.2. Fulfilment of the standard values of “Regulations on Surface Water Quality Management” in lakes and lagoons as of the end of 2022	
Name of the Activity	**Activity 2.2.1.** To determine the impacts of the existing settlements and enterprises in the basin of the Kızılırmak Delta in terms of water pollution.
Responsible institution or organization	Samsun Metropolitan Municipality, General Directorate of SASKİ, Provincial Directorate of Environment and Urbanization of Samsun
Institutions, organizations, or persons to be consulted to / cooperated with	Presidency of the Area, Bafra District Governor’s Office, Bafra Municipality, General Directorate of Water Management
Where	In sub basin of the Kızılırmak Delta
When and how often?	After approval of the MP
How?	• Following the approval of the Management Plan, a team will be established to carry out the work, which consists of the technical staff of the Provincial Directorate of Environment and Urbanization, General Directorate of SASKİ, Bafra District Governor’s Office, Bafra Municipality, and Presidency of the Area, • The established team will compile and evaluate the actions performed in past years. • Upon evaluations, “the situation of the existing settlements and enterprises in the basin of the Kızılırmak Delta in terms of water pollution” will be handled under a report and measurements will be taken under this report. • Measurement results will be submitted to the Presidency of the Area.
Personnel, equipment, cost	Technical staff of the directorate, Travel costs
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 2.2.2.** To provide disposal of all the institutions and facilities under the Environmental Auditing Legislation in the basin of the Kızılırmak Delta, inspecting their compliance with all the legislations about wastes.
Responsible institution or organization	Provincial Directorate of Environment and Urbanization of Samsun, Branch Directorate of Environmental Management
Institutions, organizations, or persons to be consulted to / cooperated with	Bafra District Governor's Office, Bafra Municipality, SYGM
Where	In sub basin of the Kızılırmak Delta
When and how often?	Every year throughout the implementation of the Water Plan
How?	• Following completion of the activity no. 2.2.1., the Provincial Directorate of Environment and Urbanization will notify all facilities to get registered in the Environment Information System, submit their waste statements, and prepare their "Industrial Waste Management Plans" that will involve all wastes that source from the facilities, either hazardous/ non-hazardous. • All facilities will submit their statements to the Waste Statement System, which is to be open from January to March in 2020, after getting registered in the Environment Information System. • By the end of August 2020, all facilities will submit their "Industrial Waste Management Plans", which will involve all hazardous and non-hazardous wastes, to the Provincial Directorate of Environment and Urbanization, and will have the same confirmed.
Personnel, equipment, cost	
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 2.2.3.** To give training in settlements related with the delta on pest control and the use of pesticides and chemical fertilizers.
Responsible institution or organization	Provincial Directorate of Food, Agriculture, and Livestock of Samsun
Institutions, organizations, or persons to be consulted to / cooperated with	Presidency of the Area
Where	In settlements related with the delta
When and how often?	Ever year, continuously and regularly
How?	• After approval of the Management Plan, a 5-year education program will be prepared, which is to include the titles of topics to be determined by the Provincial Directorate of Food, Agriculture, and Livestock of Samsun and the Presidency of the Area. • Training will be given in village coffee houses by the technical staff of the Provincial Directorate of Food, Agriculture, and Livestock of Samsun, in accordance with the education program. • The Presidency of the Area will provide support, when necessary. • The activity report concerning implementation of the education program (that includes the trainings given, the number of attendance to trainings, and general evaluation) will be shared with the Presidency of the Area.
Personnel, equipment, cost	Educator, educational material, travel costs
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 2.2.4.** To provide the control of package wastes of pesticides.
Responsible institution or organization	Provincial Directorate of Food, Agriculture, and Livestock of Samsun, Samsun Metropolitan Municipality
Institutions, organizations, or persons to be consulted to / cooperated with	Samsun Governor's Office
Where	In settlements related with the delta
When and how often?	To begin in 2019 and be continuous
How?	• Samsun Metropolitan Municipality will place containers for putting the package wastes of the chemical pesticides and fertilizers inside near the fountains in settlements related with the delta, before beginning of the disinfestations period in 2019. • Simultaneously with the placement of the containers, Provincial Directorate of Food, Agriculture, and Livestock of Samsun will provide information about the hazards of pesticide wastes and how to put the package wastes of chemical pesticides and fertilizers into the containers. In addition, Samsun Metropolitan Municipality will prepare a poster related with the subject, which will in turn be hung on the walls of coffee houses, schools, village houses, and headman's offices. • The wastes gathered in the containers will be regularly collected by the concerning municipalities and delivered to licensed companies to be disposed of.
Personnel, equipment, cost	
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 2.2.5.** To monitor water quality (pH, saltiness, electrical conductivity, chemical oxygen demand, ÇÖ, suspended solid, chlorophyll a, total nitrogen, total phosphor, pesticide values) by season in lakes and lagoons and in streams and canals feeding them.
Responsible institution or organization	7th Regional Directorate of DSİ, Presidency of the Area
Institutions, organizations, or persons to be consulted to / cooperated with	Concerning Departments of the University
Where	In lagoons, lakes, and drainage canals in the delta
When and how often?	Every month, continuously
How?	• Samples will be taken monthly from the sampling points previously determined by DSİ and will be analyzed. • An allowance and personnel will be demanded from the budget of 2020 for the setting up of automatic monitoring stations at the sampling points in all lakes and lagoons. If allowance and personnel is provided, automatic monitoring stations will be set up at sampling points. If not possible, measurements will not be set bak and monthly measurements will be taken with the portable water quality measurement device.
Personnel, equipment, cost	Setting up of automatic water quality monitoring station Travel costs, specialists' and analyses costs
Institutions and organizations to get approval / permission from	Concerning Departments of the University

U. H. 2.3. Prevention of the coastal erosion (loss) at the mouth of Kızılırmak throughout the 5 year implementation period of the Management Plan	
Name of the Activity	**Activity 2.3.1.** To have a “coastal erosion prevention project” carried out, also taking into account the existing coastal erosion prevention structures.
Responsible institution or organization	9th Zone Directorate of the Ministry of Transport, Maritime, and Communications
Institutions, organizations, or persons to be consulted to / cooperated with	7th Regional Directorate of DSİ, Presidency of the Area, Concerning Departments of Universities
Where	On the east shore of the connection point of River Kızılırmak and the sea
When and how often?	Within 1 year following the approval of the plan
How?	• Following the approval of the plan, 9th Zone Directorate of the Ministry of Transport, Maritime, and Communications will search for the reasons of the coast loss (continuance), also considering about the existing coastal entrenchment, and a project will be prepared for the prevention of coastal loss.
Personnel, equipment, cost	
Institutions and organizations to get approval / permission from	General Directorate of DSİ Regional Commission of Samsun for Protection of Natural Assets

Name of the Activity	**Activity 2.3.2.** To implement the coastal erosion prevention project.
Responsible institution or organization	9th Zone Directorate of the Ministry of Transport, Maritime, and Communications
Institutions, organizations, or persons to be consulted to / cooperated with	7th Regional Directorate of DSİ, Presidency of the Area
Where	On the east shore of the connection point of River Kızılırmak and the sea
When and how often?	In years 2020-2023
How?	• The project prepared according to Activity 2.3.1. will be submitted to the investment program of 2020 of the Transport for the procurement of source. • If the project is found appropriate and sources are allocated from the investment program, necessary permits and approvals will be received and given out by contract in 2020. • The project step will be performed depending on the source. • The Presidency of the Area will be informed about the status of the project step every year.
Personnel, equipment, cost	To be described in the project.
Institutions and organizations to get approval / permission from	

U.H. 2.4. Protection and providing sustainability of the natural habitats in the delta during and after the 5 year implementation period of the Management Plan	
Name of the Activity	**Activity 2.4.1.** To identify the existing natural habitats in the protected area by satellite image or aerial photo and marking the same on the map.
Responsible institution or organization	General Directorate of Nature Conservation-Research and Registration Department
Institutions, organizations, or persons to be consulted to / cooperated with	Concerning Departments of Universities, Presidency of the Area
Where	Within the protected area of the Kızılırmak Delta
When and how often?	Following the approval of the management plan
How?	• Following approval of the plan by General Directorate of Nature Conservation-Research and Registration Department, upon reviews and examinations to be performed in the area also benefiting from the satellite images, the natural habitats within borders of the protected area and natural habitats damaged because of human interference will be identified and marked on maps with suitable scales. • The ownership status of the damaged habitats will be considered and a report will be issued concerning rehabilitation of the same.
Personnel, equipment, cost	
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 2.4.2.** To provide information about the protection statuses in the delta and the legal situations of these statuses.
Responsible institution or organization	Presidency of the Area, Provincial Directorate of Environment and Urbanization of Samsun
Institutions, organizations, or persons to be consulted to / cooperated with	Headmen of the settlements related with the Kızılırmak Delta, Samsun Metropolitan Municipality, Samsun Branch Office of the XIth Regional Directorate of Turkish Ministry of Forestry and Water Affairs, Provincial Directorate of National Education of Samsun
Where	In settlements related with the Kızılırmak Delta
When and how often?	Following the approval of the management plan
How?	• Presidency of the Area and Provincial Directorate of Environment and Urbanization of Samsun will prepare an informative program and informative material concerning the subject. • Informative posters will be hung on the walls of village coffee houses, which involve the legal status of the area, maps of protected areas, and the principles to follow in protected areas. • An informative brochure will be prepared and distributed to the local people. • Information teams will contact with the headmen of neighbourhoods and hold public availability meetings in village coffee houses and/or village chambers.
Personnel, equipment, cost	Informative personnel and informative material (posters, brochures) Travel costs
Institutions and organizations to get approval / permission from	

U.H. 2.5. Protection and providing sustainability of the Galeriç Forest during and after the 5 year implementation period of the Management Plan	
Name of the Activity	**Activity 2.5.1.** To place warning and informative signs in the Galeriç Forest.
Responsible institution or organization	Presidency of the Area
Institutions, organizations, or persons to be consulted to / cooperated with	SAMKUŞ, Provincial Directorate of Environment and Urbanization of Samsun
Where	At suitable points to be determined at the entrances of the Galeriç Forest
When and how often?	In 2019
How?	• Following the putting into force of the Management Plan, the locations to place, the number, and the qualifications of the signs will be determined by the Presidency of the Area and an allowance will be demanded from SAMKUŞ. • If the allowance is provided, the content of the signs will be prepared and designing will be performed. • Projected number of signs will be made and placed in the determined locations.
Personnel, equipment, cost	Cost of designing, making, and placing the sign in the area.
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 2.5.2.** To have a research done for the continuation of the flooded forest character of the Galeriç Forest.
Responsible institution or organization	General Directorate of Nature Conservation-Research and Registration Department
Institutions, organizations, or persons to be consulted to / cooperated with	Presidency of the Area, Forestry Department, 7th Regional Directorate of DSİ, Provincial Directorate of Environment and Urbanization
Where	Galeriç Forest
When and how often?	In years 2019-2022
How?	• The project will be carried out by General Directorate of Nature Conservation-Research and Registration Department by the way of service procurement. • According to the outcomes of the study, impaired or semi-impaired habitats will be restored, if necessary.
Personnel, equipment, cost	To be determined in the work definition of the project.
Institutions and organizations to get approval / permission from	

U.H. 2.6. Protection and providing sustainability of the bird populations that breed as a colony on the tree in the delta during and after the 5 year implementation period of the Management Plan	
Name of the Activity	**Activity 2.6.1.** To count the egret and stork colonies regularly during breeding periods.
Responsible institution or organization	OMU Ornithology Centre
Institutions, organizations, or persons to be consulted to / cooperated with	Presidency of the Area, SAMKUŞ
Where	In egret and stork colonies of the Kızılırmak Delta
When and how often?	During the breeding period every year as of 2019
How?	• Every year, specialists from OMU Ornithology Centre will make counting of egrets and storks regularly in the delta during the breeding period. • The areas that host colonies of storks and egrets and the results of counting will be recorded in the maps and the database.
Personnel, equipment, cost	Vehicle, fuel oil, bird watcher, binoculars, telescope, GPS
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 2.6.2.** To place warning and informative signs in places that accommodate egret and stork colonies.
Responsible institution or organization	SAMKUŞ, General Directorate of Nature Conservation-Research and Registration Department
Institutions, organizations, or persons to be consulted to / cooperated with	Samsun Branch Office of the XIth Regional Directorate of Turkish Ministry of Forestry and Water Affairs, Provincial Directorate of Environment and Urbanization of Samsun, Presidency of the Area
Where	In egret and stork colonies of the Kızılırmak Delta
When and how often?	In 2019
How?	• Following the putting into force of the Management Plan, the locations to place, the number, and the qualifications of the signs will be determined by the Presidency of the Area and an allowance will be demanded from SAMKUŞ. • If the allowance is provided, the content of the signs will be prepared and designing will be performed. • Projected number of signs will be made and placed in the determined locations.
Personnel, equipment, cost	Cost of designing, making, and placing the sign in the area.
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 2.6.3.** To carry out activities to raise awareness of the local people.
Responsible institution or organization	Presidency of the Area General Directorate of Nature Conservation-Research and Registration Department
Institutions, organizations, or persons to be consulted to / cooperated with	OMU Ornithology Centre, Samsun Branch Office of the XIth Regional Directorate of Turkish Ministry of Forestry and Water Affairs, Provincial Directorate of Environment and Urbanization of Samsun, concerning district offices and headmen of the neighbourhoods where informing will be done, SAMKUŞ
Where	In the delta
When and how often?	As of 2019
How?	• With the service to be purchased by General Directorate of Nature Conservation-Research and Registration Department, an education program will be prepared with a team of specialists, which will involve the titles of topics such as the wildlife in the delta, ecological relationships and living things, the roles and importance of the living things in the delta, legal status and our responsibilities, etc. • Public availability meetings will be held with the attendance and support of the specialists and authorized persons of the Presidency of the Area, Samsun Branch Office of the XIth Regional Directorate of Turkish Ministry of Forestry and Water Affairs, and the Provincial Directorate of Environment and Urbanization in settlements that are directly connected with the protected area. • Any logistic support will be provided by the Presidency of the Area.
Personnel, equipment, cost	Specialists to supply information Travel costs
Institutions and organizations to get approval / permission from	

U.H. 2.7. Protection, improvement and providing sustainability of the crane (*Grus grus*) and Dalmatian Pelican (*Pelecanus cripus*) population which breed in the delta throughout the 5 year implementation period of the Management Plan	
Name of the Activity	**Activity 2.7.1.** To identify and map the breeding and feeding areas of the Crane (*Grus grus*) and Dalmatian Pelican (*Pelecanus cripus*) in the delta.
Responsible institution or organization	GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT, Presidency of the Area
Institutions, organizations, or persons to be consulted to / cooperated with	OMU Ornithology Centre, SAMKUŞ, Samsun Branch Office of the XIth Regional Directorate of Turkish Ministry of Forestry and Water Affairs, Provincial Directorate of Environment and Urbanization of Samsun
Where	In the breeding and feeding areas of cranes in the Kızılırmak Delta
When and how often?	2019-2022
How?	• GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT will carry out regular observations in the delta from 2019 to 2022, by which the breeding sites and important feeding zones of the cranes will be identified in the delta, the coordinates will be taken, and marked on maps. • Broods will be observed throughout the breeding period and feeding behaviours, feeding zones, breeding success; and any problems that threaten the broods, if any, the level of threat, and any measures to be taken against the threats will be determined. • The logistic support necessary for the project step will be provided by the Presidency of the Area.
Personnel, equipment, cost	An experienced ornithologist, vehicle, fuel oil, telescope, GPS
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 2.7.2.** To prevent entrance of people in breeding areas during breeding periods.
Responsible institution or organization	Presidency of the Area, Provincial Directorate of Environment and Urbanization of Samsun
Institutions, organizations, or persons to be consulted to / cooperated with	Samsun Branch Office of the XIth Regional Directorate of Turkish Ministry of Forestry and Water Affairs, SAMKUŞ
Where	In the bird breeding areas of the Kızılırmak Delta
When and how often?	Continuously and regularly during the implementation period of the Management Plan
How?	• The Presidency of the Area will not allow anyone, including photographers, into the breeding areas as set under Activity 2.7.1. throughout the breeding period. • Warning signs will be placed in the areas, regular controls will be done by the personnel of the Presidency of the Area, and visitors will be warned.
Personnel, equipment, cost	Security staff, making and placing warning signs, travel costs of the personnel
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 2.7.3.** To watch and record the crane and Dalmatian pelican populations that breed, overwinter, and accommodate during migration in the area.
Responsible institution or organization	GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT, Presidency of the Area
Institutions, organizations, or persons to be consulted to / cooperated with	OMU Ornithology Centre, SAMKUŞ, Samsun Branch Office of the XIth Regional Directorate of Turkish Ministry of Forestry and Water Affairs, Provincial Directorate of Environment and Urbanization
Where	In the Kızılırmak Delta
When and how often?	Throughout the year and regularly as of 2019-2022
How?	• GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT will regularly monitor the delta, especially the breeding areas determined in 2.7.1., from 2019 to 2022. • Number of broods and breeding success will be determined. In case of any change, the reasons will be questioned. • In addition, crane populations that accommodate and overwinter in the area during migration will be determined and recorded. • The logistic support necessary for the project step will be provided by the Presidency of the Area and SAMKUŞ.
Personnel, equipment, cost	An experienced ornithologist, vehicle, fuel oil, GPS, telescope
Institutions and organizations to get approval / permission from	

U.H. 2.8. Protection of the bird species that use the delta for breeding, overwintering, and migration during and after the 5 year implementation period of the Management Plan	
Name of the Activity	**Activity 2.8.1.** To make and record midwinter waterfowl counting (MWWC) regularly in the delta every year.
Responsible institution or organization	GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT
Institutions, organizations, or persons to be consulted to / cooperated with	OMU Ornithology Centre, SAMKUŞ, Presidency of the Area, Samsun Branch Office of the XIth Regional Directorate of Turkish Ministry of Forestry and Water Affairs
Where	In all lakes and lagoons of the delta
When and how often?	Every year during the implementation period of the Management Plan
How?	• Mid-winter waterfowl counting (KOSK) in the delta and recording of the same will be carried out by GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT. • Counting will be done in Turkey between the set dates. • The results of counting will be regularly submitted to GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT and the Presidency of Area as a report every year.
Personnel, equipment, cost	A specialist, vehicle, fuel oil, telescope, GPS
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 2.8.2.** To have a brochure prepared concerning the benefits of the birds and to carry out studies in primary schools in Samsun to raise awareness.
Responsible institution or organization	Presidency of the Area, GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT
Institutions, organizations, or persons to be consulted to / cooperated with	SAMKUŞ, Provincial Directorate of National Education of Samsun, Provincial Directorate of Environment and Urbanization of Samsun, OMU Ornithology Centre
Where	In primary schools in Samsun
When and how often?	In 2020
How?	• The Presidency of the Area will prepare and print brochures for primary school students, concerning the benefits of birds such as their role in maintaining the ecological balance, particularly taking the populations of pests and gnawing mammals under control, biological fight against diseases and pests, preventing spread of diseases and pests by consuming the carcass of dead animals in nature. • Support will be provided by SAMKUŞ and OMU Ornithology Centre for the determination of the content of the brochure. • The costs of design and printing of the brochures will be covered by GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT. • Brochures will be distributed to schools through the Directorate of National Education of Samsun and concerning district directorates of national education. • Students will be taken to the site and a photograph will be taken.
Personnel, equipment, cost	Brochure design and printing costs
Institutions and organizations to get approval / permission from	

U.H. 2.9. Providing continuation of existence of the *(Rhaponticum serratuloides, Ambrosia maritima, Pancratium maritimum, Jurinea kilaea, Galanthus rizehensis, Leucojum aestivum ve Thelypteris palustris)* plant species in their clustered range within the delta, which have priority of protection, during and after the 5 year implementation period of the Management Plan	
Name of the Activity	**Activity 2.9.1.** To form monitoring parcels and to monitor the plant species with priority of protection in their clustered ranges.
Responsible institution or organization	Presidency of the Area, GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT
Institutions, organizations, or persons to be consulted to / cooperated with	Samsun Branch Office of the XIth Regional Directorate of Turkish Ministry of Forestry and Water Affairs, Concerning Departments of Universities
Where	In the Kızılırmak Delta
When and how often?	Continuously and regularly as of 2019
How?	• The titles of topics to take place in the work description of the project to be carried out by GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT by the way of service procurement will be as: “To identify and map the ranges and population sizes of species, To identify the ecological demands of species, factors that threaten species, and level of threats, To form monitoring parcels in clustered ranges, To perform monitoring in the monitoring parcels as of the 2nd year and to consider the results of watching, To determine the protective measures for the survival of the species in the area”. • If the project is admitted to the investment program, contract awarding procedure will be completed before the vegetation period.
Personnel, equipment, cost	Personnel, vehicle, fuel oil
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 2.9.2.** To make and distribute brochures, posters, signs, and promotional products concerning the plant species with priority of protection
Responsible institution or organization	Presidency of the Area, GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT
Institutions, organizations, or persons to be consulted to / cooperated with	Provincial and District Directorates of National Education, Provincial Directorate of Environment and Urbanization
Where	In the Kızılırmak Delta
When and how often?	To be issued annually between years 2019 and 2022 and will be continuous
How?	• GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT will carry out by the way of service procurement. • Following collection of the data about the plant species with priority of protection (their range and population size, ecological demands of species, factors that threaten species, and protective measures), brochures, posters, signs, and promotional items will be made for the introduction and protection of species, also making use of such data, and these will be distributed in the visitors' centre and schools. • Introductory and informative posters, in a frame with glass, will be hung by the Provincial Directorate of Environment and Urbanization of Samsun at schools and locations where the local people come together (restaurants, coffee houses, headman's offices, and public buildings, etc.).
Personnel, equipment, cost	The costs will be covered by the General Directorate for Protection of Natural Assets. Necessary equipment and workforce, etc. for designing, poster printing, making and placing the signs will be covered by the contractor.
Institutions and organizations to get approval / permission from	

IDEAL OBJECTIVE-3: ENSURING CARRYING OUT OF SOCIO-ECONOMIC ACTIVITIES SUCH AS AGRICULTURE, STOCKBREEDING, FISHERY, AND NATURE TOURISM IN A WAY TO PRESERVE BIODIVERSITY AND IN HARMONY WITH THE AREA	
U.H. 3.1. Realization of sustainable fishery practices during the 5 year implementation period of the Management Plan	
Name of the Activity	**Activity 3.1.1.** To carry out a comprehensive research to identify the current diversity of fish and the fish stocks in the delta, to set forth the problems, and to suggest solutions.
Responsible institution or organization	GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT
Institutions, organizations, or persons to be consulted to / cooperated with	Provincial Directorate of Food, Agriculture, and Livestock of Samsun, Ministry of Food, Agriculture, and Livestock, General Directorate of Fishery and Aquaculture Products, Presidency of the Area
Where	In lakes and lagoons in the Kızılırmak Delta
When and how often?	Between 2019 and 2021
How?	• A project will be prepared about identification of the current fish variety and fish stocks in the delta, the current status and sustainability of the region in terms of fishery, and searching for problems, possible threats, and suggestions of solution. The project will be carried out by GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT by the way of service procurement.
Personnel, equipment, cost	To be determined in the work definition and budget of the project
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 3.1.2.** To develop solutions to take the pool fish (*Carasius* sp.) under control.
Responsible institution or organization	Provincial Directorate of Food, Agriculture, and Livestock of Samsun, Presidency of the Area, SAMKUŞ, Concerning Departments of Universities
Institutions, organizations, or persons to be consulted to / cooperated with	Aquaculture Products Research Institutes
Where	In Samsun province
When and how often?	In 2020
How?	• A symposium will be held in 2020 with cooperation of the Provincial Directorate of Food, Agriculture, and Livestock of Samsun and Presidency of the Area, also with the support of the concerning departments of universities and the concerning Aquaculture Products Research Institutes and with the attendance of related specialists and scientists in order to evaluate the studies carried out about invasive and expansionist species at home and abroad and to develop suggestions of solutions for taking the pool fish (*Carasius* sp.) in the Kızılırmak Delta under control. • The outcomes of the symposium will be evaluated and a work plan will be developed for taking the pool fish (*Carasius* sp.) under control. • Organization of the symposium will be performed by the Provincial Directorate of Food, Agriculture, and Livestock of Samsun and the Presidency of the Area. • Symposium costs will be covered by SAMKUŞ.
Personnel, equipment, cost	Symposium cost
Institutions and organizations to get approval / permission from	

U.H. 3.2. Providing sustainability of traditional water buffalo raising activities during the 5 year implementation period of the Management Plan	
Name of the Activity	**Activity 3.2.1.** To develop a strategy for the introduction of the water buffaloes and for making it a symbol as a socio-cultural value of the Kızılırmak Delta.
Responsible institution or organization	Presidency of the Area, Bafra Municipality, Union of Water Buffalo Raisers of Bafra
Institutions, organizations, or persons to be consulted to / cooperated with	Samsun Governor's Office, Concerning District Offices, Municipalities, Provincial representative offices of local press and national press in Samsun
Where	In the Kızılırmak Delta
When and how often?	During the implementation period of the management plan
How?	• For the purpose of introducing the Kızılırmak Delta and Water Buffalo Products, the "Kızılırmak Delta and Water Buffalo Products Festival" will be organized in 2020. • The festival will be organized with cooperation of the Bafra Municipality, Union of Water Buffalo Raisers of Bafra, and Presidency of the Area. • The Governor's Office, District Governor's Offices, and Municipalities will give place to the Kızılırmak Delta and water buffalo raising on their official web sites. • The delta will be reflected as the most important "habitat for water buffaloes" in Turkey. • For the subject to be covered in the national and local press, press trips and press releases will be organized by the Union of Water Buffalo Raisers and the Presidency of the Area, thus the topic will be taken to the press.
Personnel, equipment, cost	Festival costs
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 3.2.2.** To ensure improvement is done in water buffaloes.
Responsible institution or organization	Turkish Ministry of Food, Agriculture, and Livestock, TAGEM
Institutions, organizations, or persons to be consulted to / cooperated with	Ondokuz Mayıs University, Faculty of Agriculture, Presidency of the Area, Union of Water Buffalo Raisers of Bafra, Ondokuz Mayıs University Veterinary School, Special Provincial Administration of Samsun
Where	The Kızılırmak Delta
When and how often?	To be determined in the work plan
How?	• Raisers will be provided an incentive and they will keep the productivity records of their animals by races and select the brood accordingly for increasing the number of the race identified to be productive for the next generation. • It will be possible to improve low productivity in locations with high populations of water buffaloes by starting pure breeding and hybridization. • Trying to increase productivity of water buffaloes and making artificial breeding to improve them will be a good practice. Water buffaloes improved by artificial breeding will be able to be milked for 270 days instead of 230 days, and they will be able to deliver their first baby in 28-30 months, instead of 36 months. As known, artificial breeding offers great possibilities. Therefore, earning much more, water buffalo raisers could increase the number of water buffaloes, which will be suitable with the existing pastures. • Projects of distributing brood male water buffaloes will be feasible for the purpose of improvement. • With the improvement of the animals with the pure race breeding and selection method, education projects to teach unions and farmers to establish their own improvement systems will be feasible in the future. • Controlled mating methods should be taught to enterprises that take part in the projects to be developed about improvement, young buffalo calves obtained in this way should be identified and their weight at birth and at certain periods and milk output should be measured. It should be encouraged to maintain these data to be used as a selection criterion to determine the brood materials that will constitute the parents with superior productivity both in the existing cattles and in future generations. Therefore, the raisers included in the project are liable to fulfil the requirements of the project for a certain period and if they fulfil the requirements, they will be entitled to get support per determined amounts of animals. • Considering the “Improvement of Water Buffaloes in People’s Hands” project carried out by TAGEM, a long-term roadmap will be drawn concerning the improvement efforts.
Personnel, equipment, cost	To be determined in the work plan
Institutions and organizations to get approval / permission from	

U.H. 3.3. Determination of the impact of grazing on the wild life by the end of 2021	
Name of the Activity	**Activity 3.3.1.** To evaluate the impacts of grazing on the wild life.
Responsible institution or organization	GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT, Presidency of the Area, Union for Protection and Development of the Kızılırmak Delta in Samsun (SAMKUŞ)
Institutions, organizations, or persons to be consulted to / cooperated with	Concerning departments of universities, Provincial Directorate of Food, Agriculture, and Livestock of Samsun
Where	In areas determined as the 1st Zone in the Kızılırmak Delta
When and how often?	After approval of the Management Plan
How?	• Within 2 months following the approval of the Management Plan, the Presidency of the Area will prepare the work descriptions for projecting the activity and perform the cost analysis. While preparing the work descriptions of the project, any specialists and scientists who studied on the flora and vegetation of the area in the past will be contacted and their views and contributions will be taken about the work description to be prepared. The prepared project will be submitted to the Union for Protection and Development of the Kızılırmak Delta in Samsun, and if the project is found appropriate by the Union, it will start in 2020. • With the activity, essentially the amount of the cattle (water buffaloes) and jades that graze in the delta and the locations of the delta with intensive grazing will be identified, and the impacts of grazing on the wild life and other utilizations of the area will be studied on. • If the project is admitted into the investment program, contract awarding procedure will be completed before the vegetation period.
Personnel, equipment, cost	To be determined in the project
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 3.3.2.** To prepare the grazing plan for the natural protected area of the Kızılırmak Delta.
Responsible institution or organization	GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT Presidency of the Area, SAMKUŞ
Institutions, organizations, or persons to be consulted to / cooperated with	Ondokuz Mayıs University, Faculty of Arts and Sciences, Department of Biology, Provincial Directorate of Food, Agriculture, and Livestock of Samsun, Samsun Pastures Commission
Where	Within borders of the natural protected area of the Kızılırmak Delta
When and how often?	2019-2022
How?	• Presidency of the Area will prepare the work descriptions for projecting the activity and perform the cost analysis, also getting the views and contributions of concerning institutions (institutions, organizations, or persons to be cooperated) in 2019. The prepared project will be submitted to the Union for Protection and Development of the Kızılırmak Delta in Samsun, and if the project is found appropriate by the Union, it will start in 2022. • The study will consider the results and evaluations obtained about the impacts of grazing on wild life.
Personnel, equipment, cost	To be described in the project
Institutions and organizations to get approval / permission from	Regional Commission of Samsun for Protection of Natural Assets

U.H. 3.4. Providing an efficient visitor management as of the end of 2019	
Name of the Activity	**Activity 3.4.1.** To have the “Visitor Management Plan” prepared after evaluating the physical capacity, ecological capacity (tolerance degree of various areas to human interaction), and social bearing capacity (visitors’ expectations).
Responsible institution or organization	Presidency of the Area, GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT
Institutions, organizations, or persons to be consulted to / cooperated with	Provincial Directorate of Environment and Urbanization of Samsun
Where	In the protected area of the Kızılırmak Delta
When and how often?	Continuously and regularly as of 2019
How?	• Following the coming into force of the management plan, the Presidency of the Area will make work description and cost study for the activity (service procurement for preparing the visitor management plan of the Kızılırmak Delta), and the project to be prepared will be submitted to GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT, to be proposed for the investment program. • If an allowance is allocated from the investment program of 2020 of the Ministry of Environment and Urbanization (GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT), the project step will be realized by the way of service procurement.
Personnel, equipment, cost	To be provided in the work description of the project.
Institutions and organizations to get approval / permission from	Presidency of the Area, GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT

IDEAL OBJECTIVE-4: CONTRIBUTING TO RAISING UP OF INDIVIDUALS WITH AN UNDERSTANDING OF NATURE, RESPECTFUL TO THE NATURE, AND FEEL RESPONSIBILITY FOR PROTECTION	
U.H. 4.1. Raising awareness of at least 500 students who study in the primary schools in Merkez, Bafra, and Alaçam districts in Samsun about the Kızılırmak Delta and its natural values every year	
Name of the Activity	**Activity 4.1.1.** To develop education programs for various student groups, to prepare educational materials, and to implement the education program in cooperation with provincial and district directorates of national education.
Responsible institution or organization	Presidency of the Area
Institutions, organizations, or persons to be consulted to / cooperated with	Provincial Directorate of National Education of Samsun, Provincial Directorate of Environment and Urbanization of Samsun
Where	In the Kızılırmak Delta and Yörükler Natural Education Centre
When and how often?	Education program will be prepared in 2020, training sessions will take place according to the education program in the following years
How?	• In 2020, an Education Unit will be established under the Presidency of the Area. • Following the establishment of the Education Unit, nature education programs will be developed and educational materials will be prepared specific to the area for primary and secondary school students, in cooperation with the Directorate of National Education of Samsun. • With Yörükler Nature Education Centre becoming functional, an “Education Program Implementation Protocol” will be signed between the Provincial Directorate of National Education of Samsun and the Presidency of the Area, including the annual programs. • Education will be provided by the educators of the Education Unit of the Presidency of the Area, in compliance with the protocol.
Personnel, equipment, cost	Educational materials
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 4.1.2.** To organize contests (painting, poetry, composition) among schools on the topic “The Kızılırmak Delta” within scope of the World Wetlands Day activities.
Responsible institution or organization	Presidency of the Area, SAMKUŞ
Institutions, organizations, or persons to be consulted to / cooperated with	Provincial Directorate of National Education of Samsun
Where	In Samsun province
When and how often?	Continuously and regularly as of 2019
How?	• In October every year, a “Contest Organization Committee” will be established with cooperation of the Presidency of the Area and Directorate of National Education of Samsun. • The Contest Organization Committee will determine the jury and contest conditions for each branch of contest (painting, poetry, composition). • In September, Directorate of National Education will make announcement to schools • Contests will be concluded in January, and a prize ceremony will be held within scope of the February 2nd, World Wetlands Day. • Prizes will be provided by SAMKUŞ. • The works of students who attend painting contests will be exhibited in the Visitors and Nature Education Centre hall and in available halls in Samsun and Bafra.
Personnel, equipment, cost	Contest costs
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 4.1.3.** To issue printed materials (puzzle, sticker, colouring book, etc.) for the primary school students, which are aimed to introduce the values of the area, and to distribute the same in the schools of the locality.
Responsible institution or organization	GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT
Institutions, organizations, or persons to be consulted to / cooperated with	Provincial Directorate of National Education of Samsun, Provincial Directorate of Environment and Urbanization, SAMKUŞ, Presidency of the Area
Where	In the Kızılırmak Delta
When and how often?	2019-2022
How?	• Will be carried out with cooperation of GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT, Presidency of the Area, SAMKUŞ, and Provincial Directorate of National Education of Samsun. • The designing and printing of stickers will be made by GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT by the way of service procurement. • Printed materials will be delivered to the Directorate of National Education of Samsun, which institution will distribute the same to schools.
Personnel, equipment, cost	Designing and printing costs
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 4.1.4.** To give training on bird watching to primary school students.
Responsible institution or organization	GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT
Institutions, organizations, or persons to be consulted to / cooperated with	OMU Ornithology Centre, Provincial Directorate of National Education of Samsun, Samsun Metropolitan Municipality, Bafra and Alaçam Municipalities, Presidency of the Area
Where	In the Kızılırmak Delta
When and how often?	Continuously and regularly as of 2019
How?	• GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT will provide training by OMU Ornithology Centre on bird watching in the delta to primary school, secondary school, and high school students of Samsun Merkez, Bafra, and Alaçam districts in April, May, and June every year, within framework of an annual program to be organized among the Presidency of the Area, OMU Ornithology Centre, and Provincial Directorate of National Education of Samsun. • Transport of students to and from the area will be provided by the Directorate of National Education and concerning municipalities.
Personnel, equipment, cost	Experienced ornithologists, binoculars, telescope, books on identifying birds
Institutions and organizations to get approval / permission from	

Name of the Activity	**Activity 4.1.5.** To prepare bird watching books for children.
Responsible institution or organization	GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT
Institutions, organizations, or persons to be consulted to / cooperated with	OMU Ornithology Centre, Provincial Directorate of National Education of Samsun, Samsun Metropolitan Municipality, Bafra and Alaçam Municipalities, Presidency of the Area
Where	In the Kızılırmak Delta
When and how often?	Throughout the process of the Management Plan
How?	• Presidency of the Area and OMU Ornithology Centre will decide the number of the volume of books in the set to be served to children about the bird species observed in the Kızılırmak Delta. • Bird species will be categorized according to the number of volumes to be determined. • Illustrations of birds will also take place near the photographs of the birds in bird observation books. • Descriptive information will take place about each bird in the books to be prepared. • The books will be prepared by GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT by the way of service procurement. • Printed materials will be delivered to the Directorate of National Education of Samsun, which institution will distribute the same to the students at schools.
Personnel, equipment, cost	Designing and printing costs of books
Institutions and organizations to get approval / permission from	

IDEAL OBJECTIVE-5: PROVIDING AN EFFICIENT PARTICIPATION TO DECISION-MAKING AND IMPLEMENTATION PROCESSES	
U.H. 5.1. Monitoring and evaluation of the practices in a participant manner during the 5 year implementation period of the Management Plan	
Name of the Activity	**Activity 5.1.1.** To evaluate implementation of the management plan in three monthly periods, through the Coordination and Auditing Committee.
Responsible institution or organization	Presidency of the Area
Institutions, organizations, or persons to be consulted to / cooperated with	Coordination and Auditing Committees
Where	In the Presidency of the Area
When and how often?	Continuously for once in a three months as of the management plan's coming into force
How?	• At the first meeting to be held in 2019, the "Management Plan Periodical Evaluation Form" will be prepared. • At least one week before the following meetings, all institutions and organizations who have taken role and responsibility in implementation of the Management Plan will fill in the evaluation form related with each activity they are responsible for and submit the same in writing to the Presidency of the Area. • In addition, each institution/ organization will give information to the Committee related with the activities under its responsibility at periodical meetings. • Any problem, bottleneck, and flaw that arises during implementation of activities will be attempted to be solved in a way to find a solution at the meeting.
Personnel, equipment, cost	Cost of the meeting
Institutions and organizations to get approval / permission from	

* **Coordination and Auditing Committee: The committee authorized and assigned to approving and auditing implementation of the management plan.**

Name of the Activity	**Activity 5.1.2.** To annually evaluate the practices of the management plan and make the implementation plan for the next year.
Responsible institution or organization	Presidency of the Area
Institutions, organizations, or persons to be consulted to / cooperated with	Institutions and organizations member to the Coordination and Auditing Committee
Where	In the Presidency of the Area
When and how often?	In December every year as of 2019
How?	• An annual evaluation meeting will be held at the end of each year. • At the meeting, each institution that has taken role and responsibility in the management plan will submit its annual activity report (completed activities, missing/ half-completed activities, not started activities, reasons, etc.). • At the meeting, pluses and minuses of implementation will be evaluated, the implementation plan of the following year will be revised also taking into consideration the knowledge and experiences obtained during implementation, and measures for removing (if any) factors that prevent implementation of the activities will be discussed. • Decisions will be taken about how to complete the missing/ half-completed activities and activities will be carried away to the work flow chart of the next year.
Personnel, equipment, cost	An experienced management plan specialist, costs for the meeting and the meeting place will be covered by Presidency of the Area.
Institutions and organizations to get approval / permission from	

*** Coordination and Auditing Committee: The committee authorized and assigned to approving and auditing implementation of the management plan.**

Name of the Activity	**Activity 5.1.3.** To evaluate practices of five year management plan and make the implementation plan for the 2023-2027 term
Responsible institution or organization	Presidency of the Area
Institutions, organizations, or persons to be consulted to / cooperated with	All institutions and organizations which have a duty and responsibility in implementation of the Management Plan,
Where	Samsun
When and how often?	In 2023
How?	• At the end of 2023, the 5-year implementation period will be evaluated under consultancy of the experienced management planning specialist, with participation of all institutions and organizations who have taken role and responsibility in implementation of the Management Plan. • The implementation plan for years 2024-2028 (the 2nd five-year implementation period) will be prepared, also taking into account the knowledge and experience obtained during the 5-year implementation process.
Personnel, equipment, cost	Consulting service fee, costs of meeting and the meeting place
Institutions and organizations to get approval / permission from	

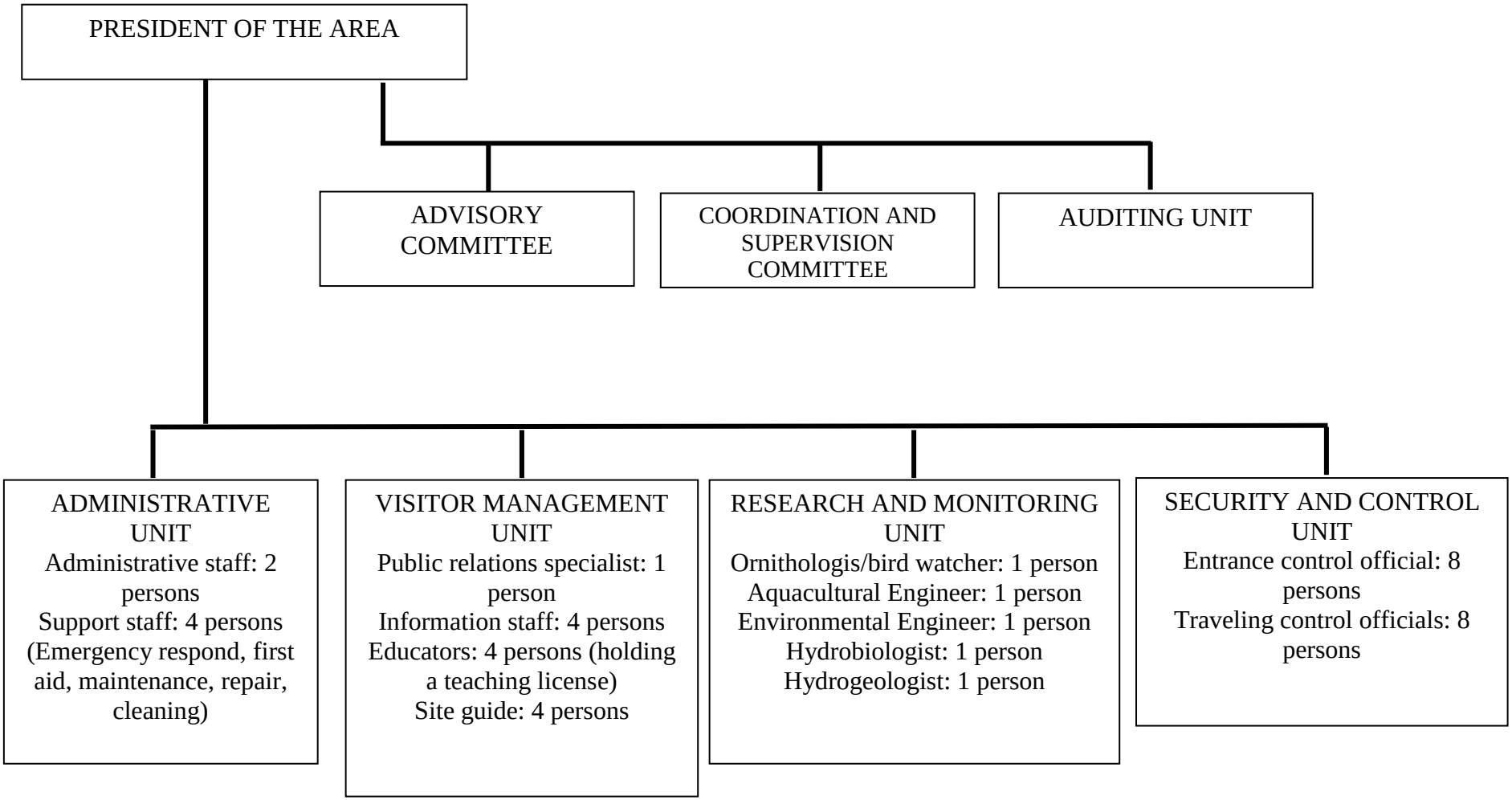
MANAGEMENT AND ORGANIZATION

In order to ensure exact implementation of the suggested management plan and efficient management of the area, it is essential to establish a management structure that consists of sufficient number of technical and administrative staff under administration of the Presidency of the Area, and to provide decentralisation.

The organizational chart suggested for the Presidency of the Area is given below. Four units are proposed under management of the Presidency of the Area, namely as;

- Administrative unit
- Visitor management unit
- Research and monitoring unit
- Security and control unit

The organizational chart of the Presidency of the Wetland and Bird Paradise in the Kızılırmak Delta



REFERENCES

REFERENCES

1. Akbulut, A., Durmuş, Y., Çalışkan, M., Akbulut, N., Demirsoy, A. (2012). Monitoring Studies For The *Hirudo Medicinalis* Populations In Turkey (2003-2006). Mun. Ent. Zool. Vol. 7, No. 2 988
2. Ayan, A.K., (2007). Kızılırmak Deltasında Dogal Kaynak Kullanımı. http:// kizilirmakdeltasi.net/2014/dosya/rapor.pdf.
3. Bekleyen, A. and Taş, B. 2008. Zooplankton fauna of Cernek Lake (Samsun). Ekoloji 17(67): 24-30.
4. Çelikkale, M.S., Okumuş İ., Memiş, D. (2004). Contemporary Status of Turkish Sturgeon (Acipenseridae) Stocks, Conservation Measures and Recent Studies. Symposium on Aquaculture Development – Partnership between Science and Producer Associations, 26 – 29 May 2004. European Inland Fisheries Advisory Commission (EIFAC), Wierzba, Poland.
5. Demirkalp, F.Y., Caglar, S.S., Saygı (Basbuğ), Y., Gündüz, E., Kaynas, S. and Kılınc, S. (2004). Preliminary Limnological Survey on the Shallow Lagoon Lake Cernek (Samsun, Turkey):Phytoplankton and Zooplankton Community Structure, in Relation to Physical and Chemical Variables, Fresenius Environmental Bulletin, 13(6): 508-518.
6. Emir, N. (1990). Samsun Bafra Gölü Rotatoria faunasının taksonomik yönden incelenmesi. Doğa Turk. J. Zool. 14: 89-106.
7. Engin, M.S. (2012). Kızılırmak Deltasında Yetişen Bazı Sucul Bitkilerin Ağır Metal Biriktirme Özelliğinin Araştırılması Ve Deltadaki Sulak Alanların Kirlilik Haritasının Çıkarılması. Ondokuz Mayıs Üniversitesi, Kimya Bölümü.
8. Gündüz, E. (1991a). Bafra Balıkgölü'nun (Balıkgölü-Uzungöl) Cladocera Türleri Üzerine
9. Gündüz, E. (1991b). Bafra Balıkgölü'nun (Balıkgölü-Uzungöl) Calanoida ve Cyclopoida (Copepoda) turleri uzerine taksonomik bir calısma. DOGA TU J. Zooloji D., 15, 4, 296-305.
10. Gündüz, E., Saygı, Y., Demirkalp, F:Y., Çağlar, S.S:, Kılınç, S. (2013). Seasonal composition and population density of zooplankton in Lake Karaboğaz from the Kızılırmak Delta (Samsun, Turkey. 37: 544-553).
11. Gürsoy, A 2007
12. Hustings, F. ve van Dijk, K. 1994. Bird Census in the Kızılırmak Delta Turkey, in Spring (1992). WIWO (Foundation Working Group International Wader and /sec Research) Report 45, Hollanda.
13. Kamacı E (2014). 2863 Sayili KTVKK'nin Uluslararasi Yasal Düzenlemeler Bağlaminda Değerlendirilmesi. METU JFA (31:2) 1-23.
14. Kaya Özdemir, D. (2016). Kent Kimliğinin Sürdürülebilirliği İçin Peyzaj Yönetim Anlayişinin Geliştirilmesi: Bartin-Amasra Örneği. Yüksek Lİsans Tezi, Bartın Üniversitesi, Fen Bilimleri Enstitüsü, Peyzaj Mimarlığı.
15. Lowe S., Browne M., Boudjelas S., De Poorter M. (2000) *100 of the World's Worst Invasive Alien Species A selection from the Global Invasive Species Database*. Published by The Invasive Species Specialist Group (ISSG**)** a specialist group of the Species Survival Commission (SSC) of the World Conservation Union (IUCN), 12pp. First published as special lift-out in *Aliens 12*, December 2000. Updated and reprinted version: November 2004.

16. Maraşlıoğlu, F., Soylu, E.N., Gönülol, A. (2011). Chlorococcal chlorophyte composition, community structure, and seasonal variations in the shallow lakes of the Kızılırmak Delta, Turkey. Turk J Biol 35: 117-124
17. Öktener, A. (2004). A Prelımınary Research On Mollusca Specıes Of Some Freshwaters Of Sinop And Bafra. G.Ü. Fen Bilimleri Dergisi 17(2): 21-30
18. Samsun İl Kültür ve Turizm Müdürlüğü, Kızılırmak Deltası Yönetim Planı 2008-2012.
19. Saygı, Y., Gündüz, E., Demirkalp, F.Y., Çağlar, S.S. (2011). Seasonal patterns of the zooplankton community in the shallow, brackish Liman Lake in Kızılırmak Delta, Turkey. Turk J Zool 2011; 35(6): 783-792
20. Sirat A., Sezer İ., Akay H., (2012). Kızılırmak Deltası'nda Organik Çeltik Tarımı. Gümüşhane Üniversitesi Fen Bilimleri Enstitüsü Dergisi 2 (2):76-92
21. Soylu, N., Gönülol, A. (2010a). Functional Classification and Composition of Phytoplankton in Liman Lake. Turkish Journal of Fisheries and Aquatic Sciences 10: 53-60.
22. Soylu, N., Gönülol, A. (2010b). Seasonal succession and diversity of phytoplankton in a eutrophic lagoon (Liman lake). Journal of Environmental Biology 31(5) 629-636
23. Şahin, B., Ayyıldız, G., Vuram, M. (2012).Kızılırmak Deltasında Görülen Habitat Tipleri Ve Korunması. III. Sulakalan Konferansı, Samsun.Turkish Journal of Fisheries and Aquatic Sciences (4):1: 49-57.
24. Taksonomik Bir Çalısma. Doga Turkish Journal of Zooloji (15) 2: 115-134.
25. Tan, A., (2013). Samsun Kenti ve Yakın Çevresinin Doğal ve Kültürel Peyzaj Özelliklerinin Turizm Potansiyeli Açısından İrdelenmesi. Ankara Üniversitesi, Fen Bilimleri Enstitüsü, Yüksek Lisans Tezi, Ankara
26. Taş, B., Gönülol, A. (2007). An ecologic and taxonomic study on phytoplankton of a shallow lake, Turkey. Journal of Environmental Biology 28(2) 439-445.
27. Ustaoğlu, S., Okumuş, İ. (2004). The Sturgeons: Fragile Species Need Conservation.
28. Ustaoğlu, M.R., Özdemir Mis, D., Aygen, C. (2012). Observations on zooplankton in some lagoons in Turkey. J. Black Sea/Mediterranean Environment Vol. 18, No.2: 208-222
29. WWF 2008; Türkiye'deki Ramsar Alanları Değerlendirme Raporu.
30. www.mgm.gov.tr
31. http://samsunkulturturizm.gov.tr
32. www.samsunkulturturizm.gov.tr/TR,59848/kizilirmak-deltasi.html
33. www.samsunkulturturizm.gov.tr/TR,59848/kizilirmak-deltasi.html
34. Yarar, M. ve Magnin, G. 1997. Turkiye'nin Önemli Kuş Alanları. Doğal Hayatı Koruma Derneği, İstanbul, Türkiye.
35. Yeniyurt, C., ÇAğırankaya, S., Lise, Y., Ceran Y (editörler) (2008). Kızılırmak Deltası Sulakalan Yönetim Planı 2008-2102. Çevre ve Orman Bakanlığı, Ankara.
36. Zengin, M., Ustaoğlu Tırıl, S., Dağtekin, M., Eryıldırım, H., Can, T., Gül, M. (2008). 2000'li Yılların Başında Kızılırmak-Yeşilırmak Havzası Mersin Populasyonlarının (Acipenser Sp, Huso) Durumu Üzerine Bir Ön Araştırma. Mersin Balığı Koruma Stratejisi ve Üretimi Çalıştayı 30-31 Ekim 2008.
37. Sirat A., Sezer İ., Akay H. (2012) Kızılırmak Deltası'nda Organik Çeltik Tarımı (2012) 2 (2):76-92
38. Çevre ve Şehircilik Bakanlığı GENERAL DİRECTORATE OF NATURE CONSERVATİON-RESEARCH AND REGİSTRATİON DEPARTMENT; Ekolojik Temelli Bilimsel Araştırma Raporu, 2016.

39. T.C. Orman ve Su İşleri Bakanlığı DKMPGM, Kızılırmak Deltası YP 2008-2012 / 2016-2018.

PHOTOGRAPH REFERENCES	
CHAPTER-BEGINNING PHOTOGRAPHS	
1. INTRODUCTION	Ufuk İŞLER
2. DESCRIPTION	Elif YAVUZ
3. STAKEHOLDER ANALYSIS AND MEETINGS	Mustafa GÜRAL
4. EVALUATION OF THE DATA	İrfan ÇİMEN
5. ZONING AND ZONING PLAN DECISIONS	İrfan ÇİMEN
SECTION 2: MANAGEMENT PLAN OF THE KIZILIRMAK DELTA FIRST 5-YEAR IMPLEMENTATION PERIOD	Özlem ÖZYÜN
REFERENCES	Ufuk SEFEROĞLU
PHOTOGRAPHS WITHIN THE BOOK	
Photograph 2.1. Lake Cernek	Nizamettin Yavuz
Photograph 2.2 Important Plant Species in the Delta	SAMKUŞ
Photograph 2.3 *Jurinea kilea* species	Yrd. Doç. Dr. Bilal Şahin
Photograph 2.4 Water and surface water plants in Lake Tatlı	E.E. Levi
Photograph 2.5 *Nymphaea alba* (Water lily)	Özden Sağlam
Photograph 2.6 *Alcedo atthis* (Kingfisher)	Özden Sağlam
Photograph 2.7 *Merops apiaster* (Bee-eater)	Özden Sağlam
Photograph 2.8 *Podiceps cristatus* (Great crested grebe)	Özden Sağlam
Photograph 2.9 *Porphyrio porphyrio* (Purple swamphen)	Özden Sağlam
Photograph 2.10 *Himantopus himantopus* (Black-winged stilt)	Özden Sağlam
Photograph 2.11 *Ciconia nigra* (Black stork)	Özden Sağlam
Photograph 2.12 *Egretta garzetta* (Little egret)	Özden Sağlam
Photograph 2.13 Water Buffalo and Jade	SAMKUŞ
Photograph 2.14 Existence of Water Buffaloes in the Delta	SAMKUŞ
Photograph 2.15 *Lepus europaeu* (European hare)	Nizamettin Yavuz
Photograph 2.16 Existence of Jades in the Delta	SAMKUŞ
Photograph 2.17 Flooded Forest	Nizamettin Yavuz
Photograph 2.18 Coastal dunes	Yrd. Doç. Dr. Bilal Şahin
Photograph 2.19 Halophilic marsh	Yrd. Doç. Dr. Bilal Şahin
Photograph 2.20 The Kızılırmak Delta	Samsun İl Kültür ve Turizm Müdürlüğü arşivi
Photograph 2.21 Agricultural Area in the Delta	Mehtap Ercan Bilgen
Photograph 2.22 Reed Field on the Left Coast Site of the Delta	Mehtap Ercan Bilgen
Photograph 2.23 The Rush Plant	Mehtap Ercan Bilgen

PROJECT TEAM

Project Coordinator	Assoc. Prof. Dr. Ülkü Nihan TAVŞANOĞLU (Hydrobiologist) Turunç Peyzaj Ltd. Şti.
Project Executor	Rabia Nurhan DÜNDAR (Master Landscape Architect) Turunç Peyzaj Ltd. Şti.
Management Plan Specialist	Osman Erdem (Agricultural Engineer) Nature Research Foundation
Environment Protection Specialist	Asst. Prof. Bilal ŞAHİN (Specialist of Botany) Çankırı Karatekin University
CBS Specialist	Lecturer Erhan ŞENER (Hydrogeologist) Isparta Süleyman Demirel University
Project Assistant	Seda YILDIZ (Master Landscape Architect) Turunç Peyzaj Ltd. Şti.
Project Assistant	Tülay Sandalcı (Biologist) Turunç Peyzaj Ltd. Şti.