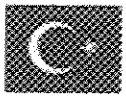

Republic of TURKEY

Ministry of Environment and Forestry

UN Convention of Biological Diversity

Fourth National Report

30/06/2009

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ABBREVIATIONS

CBD	Convention on Biological Diversity
EIA	Environmental Impact Assessment
ETAE	Aegean Agricultural Research Institute
GEF	Global Environment Facility
GMO	Genetically Modified Organism
MARA	Ministry of Agriculture and Rural Affairs
MEF	Ministry of Environment and Forestry
NBSAP	National Biological Diversity Strategy and Action Plan
NGO	Non Governmental Organization
SIA	Strategic Impact Assessment
SPO	State Planning Organization
TÜBİTAK	Turkish Institute for Scientific and Technological Research

EXECUTIVE SUMMARY

This is the Turkish Fourth National Report to the Secretariat of the Convention on Biological Diversity on its implementation of the Convention. The report is prepared based on the thematic reports of expert groups under the National Biological Diversity and Action Plan, official statistics and institutional information. It follows the structure set out by the Secretariat and is organized into four chapters.

Chapter 1 provides a broad overview of the status and trends of Turkish biodiversity; in this chapter, geological and socioeconomic features of Turkey, general information on biodiversity and current threats and trends of biodiversity have been summarized.

Turkey is one of the fortunate countries in the world which possesses vital resources for food security and thus has the responsibility to protect and use this important wealth rationally for the welfare of future generations. It has three biogeographical regions called Euro-Siberian, Mediterranean and Irano-Turanian and their transition zones and because its climatic and geographical features change within short intervals of space due to its position as a bridge between two continents, Turkey has acquired the character of a small continent from the point of biological diversity. Turkey has forest, mountain, steppe, wetland, coastal and marine ecosystems and different forms and combinations of these systems.

This extraordinary ecosystem and habitat diversity has produced a considerable species diversity. It is noted that fauna biological diversity is quite high in Turkey compared with the biological diversity of other countries in the temperate zone. Despite lack of data, the invertebrates constitute the largest number among the identified living species. The total number of invertebrate species in Turkey is about 19,000, of which about 4,000 species/subspecies are endemic. The total number of vertebrate species identified to date is near 1,500 of the vertebrates, over 100 species are endemic, including 70 species of fish. Anatolia is the home of the fallow deer and the pheasant. The fact that Turkey is located on two major bird migration routes in the world makes it an important place as a feeding and breeding area for birds. Turkey also has a rich plant biodiversity and has ratio of endemism. Turkey has approximately 11,000 gymnospermous and angiospermous plant species, one third of them endemic to Turkey. Eastern Anatolia and Southern Anatolia among the geographical regions, and the Irano-Turanian and Mediterranean regions among the phyto-geographical regions, are rich in endemic plant species.

Turkey's genetic diversity becomes important with regard to plant genetic resources in particular because Turkey is located at the intersection of the Mediterranean and Near Eastern gene centers. These two regions have a key role in the appearance of cereals and horticultural crops. In Turkey, there are 5 micro-gene centers in which more than 100 species display a wide variation and which are the origin or centre of a large number of important crop plants and other economically important plant species such as medical plants. These centers offer very important genetic resources for the future sustainability of many plant species cultivated across the world. In terms of animal genetic resources, it is agreed that many domestic animal races were originally bred in Anatolia as a result of its location and spread from here to other regions of the world.

In conclusion, while talking about the wealth of biological diversity, it must be addressed at the level of ecosystems, species, genes and biological functions and evaluated also from the point of its significance for agriculture, forestry and industry.

Chapter 2 summarizes the status of National Biological Diversity Strategy and Action Plan. The National Biological Diversity Strategy and Action Plan (NBSAP) was prepared in 2001 under the coordination of Ministry of Environment, with the intention that it should serve as a guide in implementing the Convention on Biological Diversity in harmony with other obligations and in solving the problems causing the loss of biological diversity. However, the need emerged to update the NBSAP in the light of the changing national and international conditions and trends and the progress recorded under the Convention since 2001. More than 100 representatives and experts from relevant governmental agencies, nongovernmental organizations and universities as stakeholders in the conservation, management and use of biological diversity participated in and contributed to the process of updating the NBSAP. With these representatives and experts, national workshops were held on a participatory basis and activities conducted in thematic groups on agricultural, steppe, mountain, forest, coastal and marine, and inland water biological diversity.

The activities during the revision of NBSAP conducted under the leadership of a team of specialists who provided scientific and technical consultancy to the process, the data concerning Turkey's biological diversity and the information concerning the institutional and legal infrastructure were updated, the goals for the conservation and sustainable use of biological diversity were ranked by priority, and the strategic goals and roadmap were determined. In addition, the obstacles and gaps standing in the way of achieving the priority goals, the inconsistencies in practices, and the requirements to be met for achieving the goals were identified.

The NBSAP is intended to identify and assess Turkey's biological diversity in brief, to determine an agreed strategy for conservation and to present decision-makers with proposals for action required for achieving the goals of biological diversity conservation in Turkey. The NBSAP should be regarded as a dynamic tool which may be renewed and updated as the goals are reached and as the conditions change.

In chapter 3, the detailed information on sectoral and cross sectoral integration concerning policy, legislation and plans on biodiversity has been given.

Ministry of Environment and Forestry (MEF) and its associated organizations has the national responsibility to formulate the policies concerning the conservation and sustainable use of biodiversity, to designate and manage protected areas under various statuses, to develop and implement plans and programmes, to carry out activities in this scope and to ensure coordination among different institutions.

The several Articles (Art. 63, Article 56, Article 35, Article 44, Article 45 and Article 169) of the Constitution (1982) provides the necessary base for the conservation of biological diversity and several laws and regulations are in force in line with the provisions of the Constitution in this respect.

Turkey has had awareness regarding the conservation of the natural environment since the early years of the Republic and in this framework; the several plans, programmes and strategies for conservation of natural environment have been prepared.

The National Development Plans and Annual Programmes have included issues of biological diversity in the environmental and agricultural sectors, set forth policies for the conservation

and sustainable use of biological diversity, for the augmentation of its economic value, and have specified necessary measures.

Chapter 4 is summarizing progress towards 2010 targets and implementation of the strategic plan. This chapter gives information regarding different conservation approaches, conservation efforts at habitats, species and genetic diversity levels, and also gives information on current experience and case studies as regards the promotion of sustainable use of biological diversity and controlling and reduction of pressure on biological diversity at different levels, and addressing challenges to biodiversity.

In Turkey there have been several projects and activities of both governmental agencies and non-governmental organizations in line with reaching and improving the aim and Programmes of Work of Convention as well as the 2010 target at national level. The implementation mechanism is recommended in NBSAP for implementation of the Convention effectively and for achieving the NBSAP goals with a view strengthening the coordination among relevant institutions as well as increasing their capacities.

The report has the following annexes:

- Institutional structure and legislation related to biodiversity
- National practices in thematic areas

CHAPTER I

OVERVIEW OF BODIVERSITY STATUS, TRENDS AND THREATS IN TURKEY

1. TURKEY'S BIOLOGICAL DIVERSITY AND ITS SIGNIFICANCE

1.1. TURKEY'S GEOGRAPHICAL FEATURES

Turkey is located between latitudes 36^0-42^0 North and longitudes 26^0- 45^0 East on the continents of Asia and Europe, bounded on the north by the Black Sea, on the west by the Aegean Sea and on the south by the Mediterranean Sea. Its neighbors are Bulgaria and Greece to the west, Georgia, Armenia, Azerbaijan and Iran to the east, Iraq and Syria to the south. With a total surface area of 780,576 km^2, of which 10,000 km^2 is formed by rivers and lakes.

Turkey is surrounded on the north by the Northern Anatolia Mountains which run parallel to the Black Sea coast, on the northwest by the Yıldız Mountains, on the south by the Taurus Mountains parallel to the Mediterranean coast, and on the west by the Western Anatolia Mountains perpendicular to Aegean Sea Coast.

Turkey has 33 rivers, 200 natural lakes, 159 dam reservoirs and 750 artificial lakes, which constitute its inland waters.

Turkey's highly varied topography is one of the main causes of its climatic diversity. In the Mediterranean climate which prevails in the southern and western parts of the country, summers are hot and dry, winters are mild and rainy. In the Black Sea climate dominant northern part, there is rainfall in every season; summers are not very hot just as winters are not very cold. In the central parts of the country, the continental steppe climate prevails.

Although the annual average rainfall in Turkey is about 640 mm, rainfall varies according to years, regions and seasons. The distribution of total annual rainfall between the different regions varies from 200 mm to 3,000 mm.

For reasons due to Anatolia's topography, the differences between the temperatures of the various regions in summer are not very wide, but there are wide differences between the regions in winter temperatures. In terms of average and extreme temperatures, wide differences are also observed between different geographical regions and between provinces in the same region. Frequently, there are years when the lowest winter temperature is below -20 C degrees in Central Anatolia and -30 C degrees in Eastern Anatolia. The region where the highest summer temperatures in the country are recorded (about 35-40 C) is South-eastern Anatolia, where winters are generally mild.

Of Turkey's surface area, 52.8 % is agricultural land with 34.1 % cultivated and 18.7 % grassland and meadows, and 27.2 % is forest land. 14 % of Turkey's soil is threatened by erosion at a slight degree, 20 % at a medium degree, and 63 % at a "high" and "very high" degree.

1.2. TURKEY'S SOCIOECONOMIC FEATURES

Turkey's population is about 72 million according to the population survey of 2009. The annual growth rate of population was % 24.9 in 1980-1985, it is decreasing steadily since 1986 to %11.3 in 2009. Turkey is still a country with a young population; % 26.4 of its population is under 15 years old and % 7 is above 65 years old. The rate of literacy is %88.1. National income per capita reached about $8,500 in 2009. The arithmetical population density is 93 persons per km^2. However, since the population is not evenly distributed across the country, density is greater in areas suitable for agriculture, in industrialized regions and in some coastal provinces with easy access, and lower in the internal parts of the country and in mountainous areas. The levels of education and income display features similar to the distribution of population.

According, the agricultural sector accounts about 10 % of GDP, industry for % 25 and service for %65. Despite its low share in GDP, the agricultural sector employs 25 % of the actively working population, this ratio is more than %50 for rural areas, and it is the sector with the lowest income per capita. The sector that has displayed the fastest growth in recent years and that has the highest average income per capita is the service sector.

Due to the biological diversity value that rural areas possess, their socioeconomic characteristics and needs have a special importance in determining the principles of conservation and sustainable use. In Turkey, about 75 % of the population lives in cities and 25 % in the rural areas.

Although the agricultural sector, which has been the main component of the economy for many years in the past, has witnessed a steady fall in its share in GDP over time, it is still an important source of economic activity compared with other sectors, providing 61.4 % of employment in rural areas. In this context, the agricultural sector remains the basic driving force in rural development efforts as well as being an important element of overall national development. In addition, agriculture is not only an economic activity as such but also a social process of regional, cultural and ecological importance. Since agricultural production in Turkey is carried out in small enterprises using rather low agricultural inputs, it also provides a suitable environment for the conservation of wild species on farm in the rural area.

In Turkey, rural settlements are very numerous and scattered, making it difficult for the rural population to have access to basic infrastructural and other services and complicating public investments. To overcome these obstacles, the National Rural Development Strategy, forming the rural development policy framework and envisaging the preparation of a National Rural Development Plan, was adopted in 2006.

1.3. GENERAL INFORMATION CONCERNING TURKEY'S BIOLOGICAL DIVERSITY

Detailed description of biodiversity of Turkey is given in NBSAP Section 4, which is available on http://www.cevreorman.gov.tr.

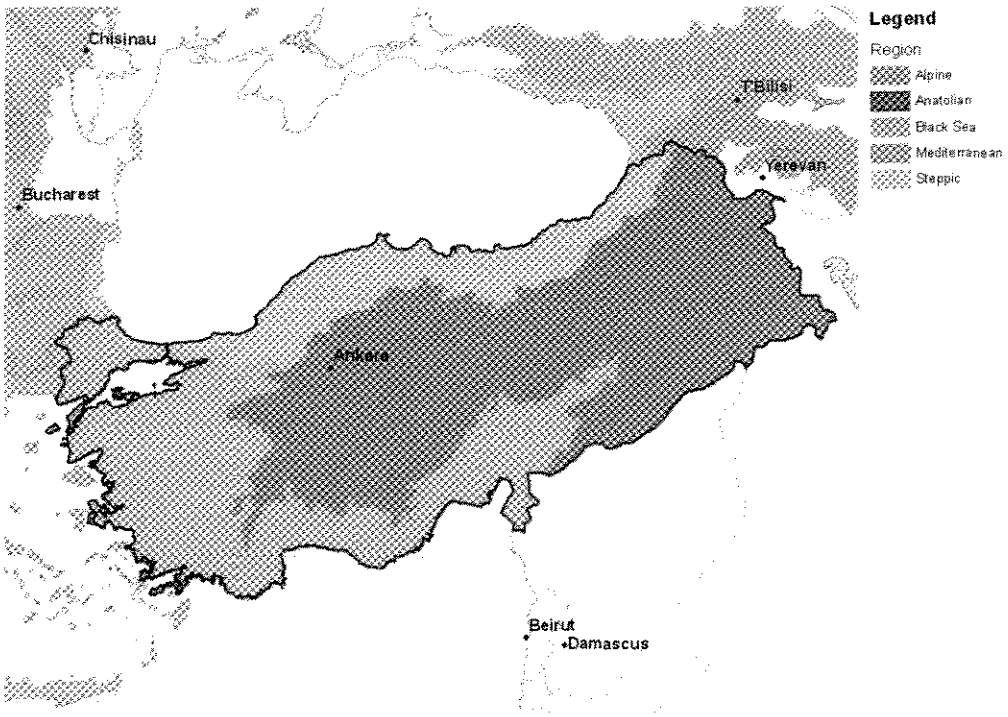


Figure 1: Biogeographical Zones of Turkey

Turkey displays the character of a small continent in terms of biological diversity. The reasons for this situation are the followings;

- Turkey has three different types of bioclimate and three Biogeographical Zones, namely Euro-Siberian, Mediterranean and Irano-Turanian,
- Turkey's topographic, geological, geomorphologic and soil diversity,
- The existence of different types of aquatic bodies such as the sea, lakes, rivers, and fresh water, salt water and mineral water lakes,
- The altitude differences that range between 0 and 5,000 meters,
- Turkey has deep canyons and very different types of ecosystem and that it was less affected by the glacial period in comparison with European countries,
- The existence of the Anatolian Diagonal which links Northern Anatolia to Southern Anatolia and the resulting ecological and floristic differences,
- Turkey is at the point where three continents intersect.

In brief, Turkey has agricultural, forest, mountain, steppe, wetland, coastal and marine ecosystems and different forms and combinations of these ecosystems.

Of the biogeographical zones, the Euro-Siberian Biogeographical Zone extends throughout Northern Anatolia and in those parts of the Thracian Region which face the Black Sea. This is the climatic region with the highest rainfall and is largely covered with forests. The Mediterranean Biogeographical Zone covers all areas on the Mediterranean cost and the western parts of Thrace and includes very different types of ecosystems. The Irano-Turanian zone is the largest of the Biogeographical Zones, starting in Central Anatolia and extending as far as Mongolia. The continental climate and steppe flora are predominant in this zone.

1.3.1. Ecosystem Diversity

Agricultural and Steppe Ecosystems

Turkey's main ecological regions from the agricultural point of view are the Mediterranean Coastal Region, the Aegean Coastal Region, the Black Sea Coastal Region, the Thrace and Marmara Regions, the Central Anatolia Region, the South-eastern Anatolia Region, the Eastern Anatolia Region and the Transition Regions (North-western Transition, Western Transition, North-eastern Transition, Eastern Transition, and South-eastern Transition). This zoning system, based on main climatic features such as rainfall and temperature, covers agricultural product diversity and the regional and phenological characteristics of agriculture. The Coastal Regions may be defined as agricultural production regions generally located in the Mediterranean climatic zone. The Central, Eastern and South-eastern Anatolia Regions are dominated by the hard continental climate, and their agricultural product characteristics carry the influences of these ecological regions. The transition regions are agricultural regions differing more or less from each other in terms of both climatic factors and overall agricultural characters, each covering several provinces in the transitions from the middle of Central Anatolia to other regions.

Cultivated areas, most of which are located in steppe zones, constitute about 35 % of Turkey's total surface area. Of the total agricultural area, 70 % is formed by cropland, 5 % by orchards, 2.7 % by vegetable gardens, 2 % by vineyards and 2 % by olive groves. The remaining 18 % of the agricultural area is left fallow according to the cultivation pattern implemented in those regions. Grasslands and meadows constitute about 19 % of Turkey's total surface area.

In Turkey, steppes and grasslands, defined as areas covered with herbaceous plants, are currently about 21 million hectares.

Forest and Mountain Ecosystems

In Turkey, forest ecosystems cover a total area of 21,188,747 hectares. Forests consisting of broad-leaved trees are more widespread in Turkey. Coniferous trees occur at all altitudes from sea level to the highest limit where forests exist. In the Aegean and Mediterranean regions, there are humid and semi-humid coniferous and dry forests (oak, black pine and red pine) as well as shrubs and maquis.

The forest types observed in Turkey according to the biogeographical regions are as follows:

Euro-Siberian Biogeographical Region:
Broad-leaved and coniferous forests (Beech, Chestnut, Hornbeam; 500-1200m),

Humid and semi-humid coniferous forests (black pine, Scotch pine, spruce, fir; 1000-1500m),

Dry oak and pine forests (Oak:<1500m; black pine: >600m; red pine: 400-500m)

Shrub (maquis and pseudo-maquis) formation (Red pine: <500m)

Mediterranean Biogeographical Region:

Shrub (maquis and garigue) formation (Oaks, Sandal, gum, myrtle, etc. 350 m Marmara, 600 m Aegean; 800 m Mediterranean),

Low-Altitude Mediterranean Belt forests (Red pine: <1000m; Black pine: 800-1500m),

Aegean High Mountain Forests (Chestnut: <1000m; Beech, Linden, Hazelnut: >1500m; Scotch pine: >1600m; Oak and Black pine: >700m, Red pine: <600m),

Mediterranean High Mountain Forests (Oak: 500-1200m; Black pine: 1200-2000m; Fir: 1200-1800m; Cedar: 1000-2000m; Juniper: 100-1800m; Beech-Hornbeam: 1100-1900m)

Irano-Turanian Biogeographical Region:

Central Anatolia Steppe Forests (Mossy and white oak, Black pine, Juniper: 800-1500m),

Central Anatolia Dry Black Pine, Oak and Juniper Forests (Oaks: <1200m; Black pine: 1000m-1500m; Scotch pine >1500m),

Eastern Anatolia Dry Oak Forests (oak species <850m).

These rich forest ecosystems of Turkey provide habitats for a great number of endemic plant species, important bird species and other wildlife species. These ecosystems also include the wild relatives of many cultivated plants which are important for agricultural biological diversity.

Mountain Ecosystems

In Turkey, there are mountain systems formed by folding, faulting and volcanism. The types of the mountain ecosystems vary according to biogeographical regions, to patterns of formation and to altitudes.

The mountains formed by faulting exist in the Aegean Region. These mountains extend perpendicular to the coast and are rich in water resources. The Kaz Mountains, the Yunt Mountains, Boz Mountains and the Aydın and Menteşe Mountains are important mountains of this region. The Kaz Mountains are the habitat of endemic species such as the Kaz Mountain Fir (Abies nordmanniana ssp. equi-trojani).

Among the mountain chains of Turkey formed as a result of the Alpine-Himalayan folding, the most important ones are the Yıldız, Köroğlu, Küre, Canik and Eastern Black Sea Mountains to the north, the Western and Central Taurus Mountains to the south, the Nur and Southeastern Taurus Mountains to the southeast, and the Hınzır, Tahtalı, Munzur,

Palandöken, Allahüekber and Aras Mountains in Central and Eastern Anatolia. These mountain systems are important ecosystems from the point of biological diversity with their high rates of endemism. The higher parts of the Eastern Black Sea Mountains and the northern and north-eastern parts of Eastern Anatolia are dominated by sub-alpine and alpine meadows and the high mountain floors of other regions by steppe and meadow ecosystems. Forest ecosystems that differ according to regions begin as altitude decreases. In addition, lakes in high mountain sections isolated from each other and having different characteristics, form special habitats.

Of the volcanic mountains, which add special value to biological diversity with their volcanic lake formations in particular, the most important ones are Ağrı, Tendürek, Nemrut, Süphan, Karacadağ, Erciyes, Hasan and Kula. With their mineral-rich soil, they also have a special importance for agricultural biological diversity.

Inland Waters Ecosystems

With its rivers and lakes covering an area of about 10,000 km^2, Turkey has very important inland water resources to maintain biological diversity. In studies conducted so far, 135 wetlands of international significance have been identified and 12 of them designated as Ramsar sites. In Turkey, there are 7 drainage basins including 26 river basins, and the ground waters are estimated at 94 billion m^3. The average annual rainfall is about 640 mm, roughly one third of which reaches water reserves and thus contributes to the maintenance of wetlands.

The largest natural lake is Lake Van in Eastern Anatolia, with a surface area of 374,000 hectares and with high salinity. In the Central Anatolian Plateau, there are some shallow salt lakes, the largest of which is Lake Tuz (128,000 hectares) and which have significant importance for halophytic plant diversity and bird diversity.

In Turkey, there are nine rivers more than 500 km in length: Kızılırmak, Fırat, Sakarya, Murat, Aras, Seyhan, Dicle, Yeşilırmak and Ceyhan. Among these Dicle and Fırat which discharge into Basra Bay over Syria and Iraq; Aras which discharges into Caspian Sea over Turkey, Armenia, Iran and Azerbaijan; Asi which discharges into Mediterranean over Turkey are the transboundary waters of Turkey. Meriç which discharges into Aegean Sea is boundary water between Turkey and Bulgaria. Deltas are of great importance for biological diversity, especially for water birds. The Meriç, Gediz, Büyük Menderes and Küçük Menderes Deltas, formed by rivers that discharge into the Aegean Sea, and the Göksu, Seyhan and Ceyhan Deltas, formed by rivers that discharge into the Mediterranean, provide suitable habitats for a large number and variety of water birds, particularly as lakes in Anatolia freeze in winter. The delta formed by the Kızılırmak, which discharges into the Black Sea, has great importance especially for migratory birds that pass directly over the Black Sea.

Turkey's highly complex geography and the fact that rivers are separated by mountainous areas from each other, thus preventing to a large extent the diffusion of species, have resulted in high endemism and genetic diversity. For this reason, a great majority of the invertebrates living in river ecosystems are endemic.

236 fish taxa belonging to 26 families have been identified in inland waters ecosystems as a result of the studies conducted so far. The most common species present in our waters are the brown trout, the pike, the carp, the tench, the striped mullet, the roach, the zander and the

inland waters bass. Located on bird migration routes, Turkey is a key country for many bird species. There are about 460 bird species in Turkey. The stork, the flamingo, the spoonbill, the black-winged stilt, the avocet, the crane, the ardeae and ducks are bird species commonly observed in Turkey's wetlands.

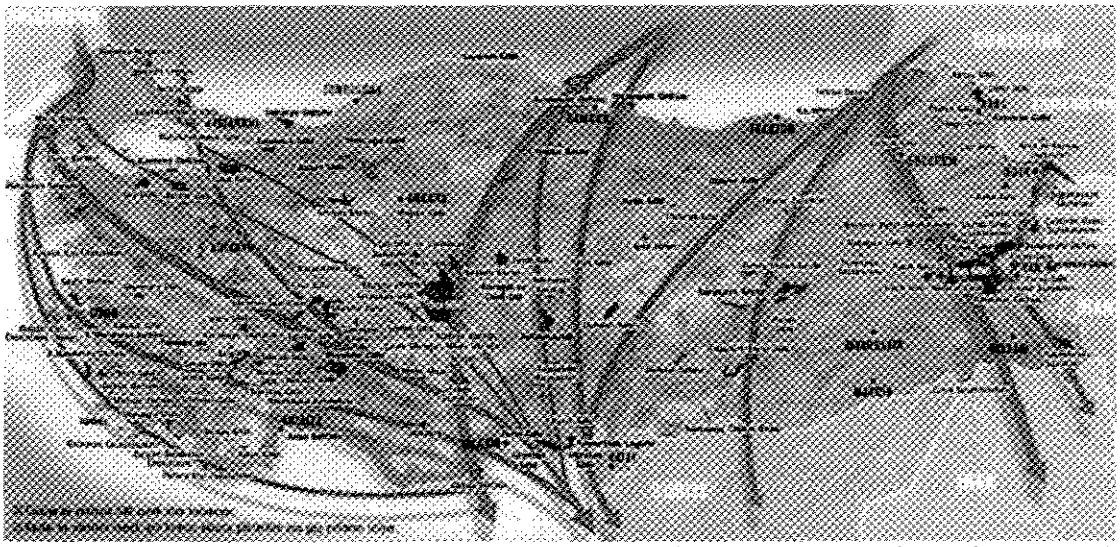


FIGURE 2: Bird Migration Route This route is evolutionary determined by the biogeography, particularly by the 500 wetlands of Turkey

Coastal and Marine Ecosystems

The different characteristics of the seas surrounding Turkey, namely the Black Sea, the Marmara, the Aegean and the Eastern Mediterranean, have resulted in the diversification of the biological resources they contain. The Mediterranean, which has the highest salinity and temperature among them, is the area with the richest biological diversity. After the opening of the Suez Canal, many species belonging to the Indian-Pacific area migrated through the Red Sea to the Mediterranean and settled in this area. 26 alien species were identified to have settled in the area through migration. There are 388 fish species in the Turkish waters of the Mediterranean, 389 in the Aegean, 249 in the Sea of Marmara and 151 in the Black Sea.

The Black Sea is the largest enclosed sea of the world and the most isolated from oceans. In the Black Sea, there are 151 fish species, 1,619 fungus, alga and high water plant species and 1,983 invertebrate species. Fish species such as the sturgeon which are important both for biological diversity and for economic value and 4 sea mammal species live in the Black Sea. There are 6 different sea meadow species (Zostera marina, Z. Noltii, Potamogeton pectinatus, Ruppia maritima, R. Spiralis and Zannichellia major) which are the spawning grounds of 34 fish species. The areas covered by sea meadow species are getting smaller.

The Turkish Straits System, consisting of Strait of Istanbul and Strait of Çanakkale and the Sea of Marmara, has the position of an inland sea system providing water transport between the Aegean Basin of the Eastern Mediterranean and the Black Sea and performs the function

of a biological corridor for the bonito, the large bonito, the bluefish and similar fish species. It has been observed that the surface of the Sea of Marmara is under the influence of the Black Sea waters coming through the Turkish Straits. The deeper regions of the Sea of Marmara contain Aegean-Mediterranean waters and host more than 400 species of benthic organisms. The Sea of Marmara is the spawning ground of many pelagic fish species. Gerardia savaglia, a coral species, still maintains its life at the depth of 30 m.

With a surface area of about 180,000 km^2, the Aegean Sea has a very complicated bottom topography and coastal geometry. In addition, there are hundreds of islands, big and small, on this sea. It may be said that the basin generally consists of 3 deep depressions. The northern depression is about 1,500 m deep and connected to the 1,100 meter-deep middle Aegean depression by a hill 200-500 m deep. In the southernmost part, there is the deepest region of the Aegean Sea with depths exceeding 2,000 m. Sponges, which are generally black in their natural environment, are one of the commercial products harvested from the deep waters of the Aegean, and a decrease has been observed in their populations in recent years. As in the Black Sea, the coasts of the Eastern Mediterranean are connected to the deep basin by a topographic slope belt of 10-20 km. The major depressions of the Northern Mediterranean are the basins of Rhodes (4,000 m), Antalya (2,500 m), Çukurova (1,000 m) and Latakia (1,500 m). The Çukurova Basin is shallower than the Antalya Basin, and they are separated from each other by a wall-shaped topography.

Coastal ecosystems are highly special ecosystems as they are important sudden transition zones (ecotones) where marine and terrestrial ecosystems intersect. Coastal ecosystems form 4.1 % of the terrestrial resources that make up the country's surface area. The fact that the patterns in which mountains come down to the sea, and the coastal topography, differ from each other in the coastal areas of Turkey have resulted in various coastal ecosystems such as dunes, caves, deltas, lagoons, marshes and calcareous terraces. Among all these coasts, particularly the coastal areas in the Eastern Mediterranean region are rich ecosystems with very high flora and fauna diversity.

1.3.2. Species Diversity

Plant species

Turkey may be considered quite rich in plant species, especially seed plants, considering the climate zone in which it is located.

Although there are an increased number of studies on algae, the inventory of the algal flora in Turkey has not yet been completed.

The number of known lichen species in Turkey is around 1,000 and steadily increasing. It has been determined that 3 Horny Liverworts, about 165 Liverworts and about 740 Mosses exist in Turkey.

The ferns live in all areas of Turkey except in very arid areas. The Black Sea region is the area where this plant group occurs most widely. Among the ferns, 8 species of the Equisetales, 6 species of the Lycopodiales and about 80 species of the Filicineae are present in Turkey.

The number of seed plant species identified in Turkey is currently about 11,000. This number increases over time with the identification of new species. Turkey has the character of a continent in terms of seed plant diversity. Furthermore, 34 % of the species in Turkey are endemic. This high rate of endemism makes Turkey interesting in terms of seed plants and maintains its character as a centre of attraction in this regard.

Plant Groups	Defined Species/subspecies	Endemic Species	Rare and Endangered Species	Extinct species
Algae	2.150	----	unknown	unknown
Lichen (Lichenes)	1000	----	unknown	unknown
Moss (Bryophytes)	910	2	2	unknown
Ferns (Pteridophytes)	101	3	1	unknown
Gymnospermae (Gymnosperms)	35	5	1	unknown
Monocotyledonous (Monocotyledons)	1.765	420	180	-
Dicotyledonous (Dicotyledons)	9.100	3500	1100	11

Table1. Taxon numbers of species and subspecies of various plant groups; endemism, rare and endangered species, extinct species

Endemic/endangered plant species

In its geographical zone, Turkey is one of the richest countries in endemic plants. Because species that belong to seedless plant groups are widely distributed as is the case in the rest of the world, their rate of endemism is low. In addition, studies on seedless plant groups in Turkey are not yet at the desirable level. The Ferns (Pteridophytes) are the best-known plant group among seedless plants. The number of ferns at species and sub-species level identified in Turkey is 101, only 3 of which are endemic.

The rate of endemism is low in the Gymnospermae; there are only 5 endemic taxa at variety and sub-species level. The rate of endemism is very high in the Angiospermae; 3,920 of the nearly 11,000 flowering plant species and sub-species are endemic, which means an endemism rate of about 34 %. The local endemics live mainly in certain mountains and mountain chains. The Compositae are the richest family in terms of endemic seed plants with 435 endemic species. This family is also the family in Turkey that contains the greatest number of species. The second rank in this respect is held by the Leguminosae family with about 400 endemic species. This family also comes second in Turkey with respect to the total number of species it contains. The third rank is held by the Labiatae family with about 310 endemic species. The tragacanth (Astragalus) is the richest genus in terms of the number of endemic species, at about 250, followed by the motherwort (Verbascum) with 175 species, the centaury (Centaurea) with 115 endemic species and the Hieracium with 66 species. The rate of endemism is 100 % for the genera Ebenus (14 species) and Bolanthus (6 species), all of whose species distributed in Turkey are endemic, although they have a low number of

species. Turkey may be considered rich in endemic genera as well as in endemic species. The endemic genera represented by one species are Kalidiopsis and Cyathobasis (Chenopodiaceae), Phryna and Thurya (Caryophllaceae), Physocardamum and Tchihatchewia (Cruciferae), Nephelochloa and Pseudophleum (Gramineae), Dorystoechas (Labiatae), Sartoria (Leguminosae), Crenosciadium, Ekimia, Postiella and Aegokeras (Umbelliferae).

Among the phytogeographical regions, the Irano-Turanian region contains the greatest number of endemic species. It is followed by the Mediterranean and Euro-Siberian phytogeographical regions. Among the geographical regions in Turkey, the greatest number of endemic species exists in the Mediterranean region with 800 species, followed by Eastern Anatolia with 380 species and Central Anatolia with 280 species.

Distribution of endemic plant species among the phyto-geographical regions (including subspecies and varieties)	
Euro-Siberian	320
Mediterranean	1325
Irano-Turanian	1250
Non-specific to particular phytogeographical region	1030
Total	3925

Table 2. Distribution of endemic plants of Turkey based on the phytogeographical regions

Although Turkey is very rich in endemic plants, some of these species are faced with serious threats. According to the IUCN 2001 criteria, about 600 of our endemic species are in the category of "Critically Endangered-CR" and about 700 in the category of "Endangered-EN". Through the "Turkish Endemic Plants Project", implemented with SPO support between 1992 and 1997, seeds of many endemic plants were collected for the purpose of *ex-situ* conservation at the Gene Bank of Menemen within the Aegean Institute of Agricultural Research affiliated to the Ministry of Agriculture and Rural Affairs.

The Turkish flora, which has a rather high rate of endemism, is also quite rich in medical and aromatic plants. Some of the important genera and species used for medical and aromatic purposes are: Delphinum sp., Digitalis sp., Gypsophila sp., Helichrysum sp., Leucojum aestivum, Linum sp.,Liqiudambar orientalis, Malva sp., Matricaria sp., Mentha sp., Nigella sp., Orchis sp., Ophrys sp., Origanum sp., Pimpinella sp., Rosa sp., Salvia sp., Sideritis sp., Teucrium sp. and Thymus sp.

Animal species

Considering the zone in which it is located, Turkey is also rich and interesting in fauna. Among the main reasons for this situation, one may count the fact that Anatolia forms a bridge between the continents of Europe and Asia and is therefore located on migration routes, that it has different types of climate and ecosystem, that it has a rich flora and, consequently, that many animal species can find here suitable habitats for themselves. All these diverse ecological factors are reflected in the diversity of the fauna.

Thanks to the large number of studies on the Turkish vertebrate fauna, the richness in fauna has largely been brought to light. According to latest data, 460 bird species, 161 mammal species, 141 reptile species, 480 sea fish species and 236 inland waters fish species are known to live in Turkey.

The group of insects (Insecta) is very rich in Turkey as in the rest of the world. However, it is hard to give exact number of insect species in Turkey due to insufficiency of studies on their inventory. The number of insect species identified in Turkey so far is about 30,000, although the estimated number is between 60,000 to 80,000. Nevertheless, the check list of certain insect groups has largely been completed. For example, the dragonflies (Odonata) are represented in Turkey by 114 species, the locusts (Orthoptera) by 600 species (270 of them endemic), the beetles (Coleoptera) by 10,000 species, the mollusks (Molluska) by 522 species (203 of them endemic), the bugs (Heteroptera) by 1,400 species, the plantlice (Homoptera) 1,500 species, the butterflies (Lepidoptera) by 6,500 species (600 of them diurnal, the others nocturnal).

Although some of the habitats in Turkey are degraded or even damaged, they provide shelter for endangered species such as the Mediterranean seal (Monachus monachus), the sea turtle (Caretta caretta) and the green sea turtle (Chelonia mydas).

Animal Groups	Defined Species	Endemic Species/subspecies, Variety	Rare and Endangered Species	Extinct Species
VERTEBRATES				
Reptiles/Amphibian (Reptilia/Amphibia)	141	16	10	-
Birds (Aves)	460	-	17	-
Mammals (Mammalia)	161	37	23	7
Freshwater Fish (Pisces)	236	70	-	4
Maritime Fish (Pisces)	480	-	-	-
SPINELESS				
Mollusk (Mollusca)	522	203	unknown	unknown
Butterflies (Lepidoptera)	4.500	89	89	unknown
Locusts (Orthoptera)	600	270	-	-
Dragonflies/Damselflies (Odonata)	114	-	-	-
Beetles (Coleoptera)	~10.000	~ 3.000	-	-
Half-winged (Heteroptera)	~1400	~200	-	-
Aphids (Homoptera)	~1500	~200	-	-

Table 3. Taxon numbers of Species and Subspecies of various animal categories, endemism situation, number of rare and endangered species, extinct species

Endemic/endangered animal species

Many studies have already been made and some continue to be made on Turkish vertebrates. For this reason, healthy data are available concerning the endemism status of vertebrates, their danger classifications and the conservation status. There are no endemic species of bird in Turkey. However, 5 mammal species and 32 sub-species, 16 reptile species and subspecies, and 70 inland waters bird species and sub-species are endemic.

Among 141 reptile and amphibian species, 16 of them are endemic and 10 of them are endangered. Some of the endemic and endangered reptile and amphibian species are the following:

- Terrestrial salamander (Mertensiella luschani),
- Spotted salamander (Neurergus crocatus crocatus and N. strauchii barani)),
- Little crested salamander (Triturus vulgaris kosswiigi),
- Band crested salamander (Triturus vittatus cilicensis),
- Red frog (Bombina bombina arifi yensis),
- Taurus frog (Rana holtzi),
- Rock lizard (Lacerta saxicola),
- Kayseri lizard (Lacerta cappadocica),
- Taurus lizard (Lacerta danfordi anatolica),
- Great green lizard (Lacerta trilineata),
- Caucasian viper (Elaphe hohenackeri),
- Small viper (Vipera ursinii),
- Striped viper (Vipera pontica).

Of the 460 identified bird species, although none of them endemic, 17 are endangered. Some of the endangered bird species are the following:

- Dalmatian pelican (Pelecanus crispus),
- White-fronted goose (Anser albifrons),
- Red-breasted goose (Branta rufi collis),
- Ferruginous duck (Aythya nyroca),
- White-headed duck (Oxyura leucocephala),
- Spotted eagle (Aquila clanga),
- Imperial eagle (Aquila heliaca),
- Lesser kestrel (Falco naumanni),
- Corncrake (Crex crex),
- Great bustard (Otis tarda),
- Slender-billed curlew (Numenius tenuirostris).

The bald ibis (Geronticus eremita) whose natural population is exhausted is under effective conservation. A great majority of the other bird species are included among the species requiring conservation. Of the 161 mammal species recorded in Turkey, 37 sub-species and/or varieties are endemic. 23 of these species are endangered and now under conservation. The gazelle (Gazella subgutturosa), the fallow deer (Cervus dama) and the wild sheep (Ovis orientalis), naturally occurring in Turkey, may be mentioned among important species. In addition, the hyena (Hyena hyena) is thought to have become extinct over the last 20-30 years. It is known that the leopard (Panthera pardus tulliana), the Caspian tiger (Panthera tigris virgata) and the lion (Panthera leo persica) have also become extinct in Anatolia.

Among the sea fishes, there are no endemic and endangered species, but 70 of the 236 species occurring in inland waters are endemic and 4 extinct. Some of the endemic and endangered species occurring in inland waters are the following:

- Salton pupfish (Aphanius asquamatus)
- "gökçe" fish (Alburnus akili)
- Bleak (Alburnus timarensis)
- Barbel (Barbus plebejus kosswiigi)
- Siraz (capoeta antalyensis)
- Gudgeon (Gobio gobio insuyanus)
- Chub (Leuciscus kurui)
- Salmon trout (Salmo trutta abanticus)

1.3.3. Genetic Diversity

Plant genetic diversity is of great importance for both Turkish and world agriculture. Turkey has a very special position in terms of plant genetic resources. Of the centers of diversity and origin explained by Vavilov, the Mediterranean and Near Eastern Centers overlap in Turkey. These two regions have a key role in the emergence of cereals and horticultural plants. Some of the cultivated plant species of Anatolian origin are the following: Linum sp., Allium sp., Hordeum sp., Triticum sp., Avena sp., Cicer sp., Lens sp., Pisum sp., Vitis sp., Amygladus sp., Prunus sp., Beta sp., etc.

According to J. Harlan, Turkey has 5 micro-gene centers where more than 100 species display a broad variation and is the origin or diversity centre of many important cultivated plants and other plant species. These "micro-gene centers" are:

- Thracian-Aegean Region: Bread wheat, durum wheat, Poulard wheat, stick wheat, small red wheat, lentil, chickpea, melon, vetch, lupine and clover.

- Southern-Southeastern Anatolia: Double-grain wheat (Tritucum dicoccum), small red wheat, Aegilops speltoides, squash, watermelon, cucumber, bean, lentil, broad bean, vine and fodder plants.

- Samsun, Tokat, Amasya: Large number of fruit species and varieties, broad bean, bean, lentil and various leguminous crops used for animal feed.

- Kayseri and its vicinity: Almond, apple, pea, fruit species, vine, lentil, chickpea, lucerne (alfalfa) and sainfoin.

- Ağrı and its vicinity: Apple, apricot, cherry, sour cherry, leguminous fodder crops and watermelon.

In Turkey, wheat (Triticum and Aegilops) has 25 wild relatives, barley (Hordeum) 8, rye (Secale) 5 and oat (Avena) 8. Turkey is also rich in wild relatives of edible grain legumes and fodder crops. Turkey has 4 varieties of lentil (Lens), 10 of chickpea (Cicer), 104 of trefoil (Trifolium) of which 11 are endemic, 34 of lucerne (Medicago), 42 of sainfoin (Onobrychis), and 60 of vetch (Vicia) of which 6 are endemic (Açıkgöz et al. 1998). Turkey is also the micro-gene centre of the species Amygdalus spp., Cucumis melo, C. sativus, Cucurbita

moshata, C. pepo, Malus spp., Pistachio spp., Prunus spp., Pyrus spp. and Vitis vinifera (Tan, 1998). Turkey is the home of many ornamental plants including the tulip and the snowdrop.

Being aware of the importance of agricultural plants, the Ministry of Agriculture and Rural Affairs (MARA) grows many species and varieties of each such plant under the Seed Production and Distribution Programme. Field crops include wheat, barley, corn, chickpeas, lentils, dry beans, sunflowers, potatoes, soy beans, peanuts, sesame, tobacco, cotton and beet-roots, and fodder plants include sweet sorghum, rye, flat scots broom and spring grass. The programme covers more than 200 plant species. In addition, there are thousands of local varieties, ecotypes and transition forms raised by farmers out of their own resources.

The total number of cereal types developed through the use of local and imported breeds and recorded during the last thirty years in Turkey is 256, of which 95 are wheat types, 91 corn, 22 barley, 22 rice, 16 sweet sorghum, 11 oat and 2 rye. The National Seed Programme constantly raises new varieties and the number of cultivated species thus steadily increases, while field crops such as small red wheat (Triticum monococcum), double-grain wheat (Triticum dicoccum), bitter vetch and lupine are not used as much as in the past and consequently tend to disappear today.

Horticultural plants include about 50 genera which are cultivated and 100 varieties grown and distributed. Among them one may count tomatoes, peppers, aubergines, lettuce, cabbage, radish, onions, squash, cucumbers, melons, watermelons, beans, pumpkin, peas, spinach, carrots, broad beans, leeks, rocket, purslane, fennel, cauliflower, parsley, beans and gherkins. Considering the local varieties and the types obtained from other resources, it is estimated that the total number of varieties grown in the country reaches 200.

The richness of variety is also noticeable in fruit production. Of the fruit types estimated to number 138 in total, 80 are grown in Turkey. Among the fruit and nut varieties in Turkey, one may count apples, pears, quinces, cherries, sour cherries, apricots, peaches, figs, pomegranates, mulberries, almonds, hazelnuts, walnuts and pistachios. Viniculture holds an important place in Turkey's agriculture. Anatolia which hosts the wild vine (Vitis silvestris) is the gene centre of the grape vine (Vitis vinifera).

Turkey is also quite rich in genetic resources of forest trees, including the valuable genetic resources of the Taurus cedar, the oriental spruce and the oriental beech together with 5 pine, 4 fir, 20 oak and 8 juniper species among the local forest trees of national and global importance. The important forest trees are as follows: Pine species (Pinus brutia, P. nigra, P. sylvestris, P. halepensis and P.pinea), fir species (Abies nordmanniana subsp. nordmanniana, A. nordmanniana subsp. bornmulleriana, A. nordmanniana subsp. equitrojani, A. cilicica subsp. cilicica, A. cilicica subsp. isaurica), the Taurus cedar (Cedrus libani), the beech (Fagus orientalis), the spruce (Picea orientalis), the linden tree (Tilia spp.), the alder (Alnus spp. 2 species, a total of 6 taxa), the juniper (Juniperus spp. 8 species), and the oak (Quercus, about 20 species).

Turkey is an agricultural country where plants and animals have been raised since ancient times. The Southeastern Anatolia region, also called Northern Mesopotamia, is considered one of the centers of cultivation where mankind first started sedentary agriculture. For this reason, it is considered that many local animal races were first bred here by past civilizations and spread to other regions of the world. Turkey has rich genetic resources with 8 cattle, 18 sheep, 4 goat, 7 horse and 9 poultry races as can be seen in Table 4. The cross-breeding of

local race farm animals with imported culture races has led to the danger of the loss of local genetic resources. On the Black Sea coastal strip, almost all local cattle have been turned into the Jersey race. Nevertheless, only 25 % of the local races have been crossbred with culture races and 75 % maintain their purity. Again, the 'Kıvırcık' sheep of Thrace has been crossbred with the German 'Ots-Friz' race to develop the Tahirova race, causing the genetic erosion of both endemic species. Certain sheep varieties such as 'Karakul' which lives in the northern transition zone; and 'Tuj' which lives in the Kars region are faced with the danger of extinction. Another local animal race under threat is the Angora goat, which has been placed under protection to prevent its total extinction.

There are not sufficient studies on the genetic diversity of aquatic species and invertebrates (especially insects).

DOMESTIC ANIMAL BREED	BREEDING REGION
CATTLE BREEDS	
Yerlikara	All regions except northeastern Anatolia and Thrace
Doğu kırmızısı	Eastern Anatolia to Ankara
Bozırk	Eskişehir, Kütahya
Kutlak cattle	Çorum
Güney sarısı	South and Southeastern Anatolia
Kilis cattle	Gaziantep
Domestic buffalos	Afyon,Kütahya,Uşak,Denizli,Kayseri
SHEEP BREEDS	
Akkaraman	From Eskişehir to Hakkari
Morkaraman	Erzurum, Erzincan, Bingöl
Ulaş-Kangal karamanı	Sivas, Malatya,
Güney karamanı	South and Southeastern Anatolia
Karakaş sheep	Southeast, especially Diyarbakır
Ödemiş sheep	Izmir
Dağlıç	Bilecik, from Eskişehir to the Aegean
Ivesi	Southeast Anatolia
Herik sheep	Eastern Black Sea Region
Hemşin sheep	East of Black Sea Region
Tuj sheep	Kars
Wool sheep	Trakya, South Marmara
Karakaya sheep	Eastern Black Sea Region
Sakız sheep	Aegean Coasts
Imroz sheep	Çanakkale
Turkish Merino	Marmara
Central Anatolian Merino	Central Anatolia
Malya sheep	Central Anatolia
GOAT BREEDS	
Angora Goat	Ankara, Central Anatolia
Wool goat	At all regions
Kilis goat	Southern Anatolia
Akkeçi (1)	Central Anatolia
HORSE BREEDS	
Anatolian horse	Central Anatolia
Çukurova horse	South and Southeast
Domestic Arabian horse	Southeast
Uzunyayla horse	Kayseri, Sivas
Canik horse	Black Sea Region
Malakon horse	Kars

Arabian horse	Southeast
POULTRY	
Domestic breeds of fowl	At all regions
Denizli breed	Denizli and its locations
Gerze breed	Sinop
Çıplak boyun	Muğla
Zile breed	Sivas
Domestic breeds of turkey	Throughout the country
Domestic breeds of goose	Throughout the country
Domestic breeds of duck	Throughout the country
Angora rabbit	Throughout the country

Table 4. Local steppe animal races

1.4. CURRENT STATUS OF THREATS AND TRENDS

1.4.1 Threats to Agricultural and Steppes Biological Diversity and their Causes

Farming enterprises in Turkey are small, fragmented and scattered. With negative results for agricultural production, this structure creates an advantage in terms of biological diversity as it provides small habitats for wild plant and animal species. On the other hand, the fact that farming areas are generally located in steppe ecosystems makes it difficult to distinguish agricultural biological diversity and steppe biological diversity from each other. For this reason, these two ecosystem structures have been considered together.

In Turkey, the most reduction and loss is in steppe ecosystems on ecosystem basis. The major cause of this is that steppe areas mainly occur in flat plains, that they are suitable for human settlement. Table 5 summarizes the threats to agricultural biological diversity and steppe ecosystems. While some of these threats arise out of factors connected with agricultural practices, the others arise out of factors that affect land and resource utilization patterns.

Meadow management: Turkey's meadow lands are generally under state property, but the Government gives a right to the farmers living in the region to benefit meadows for the purpose of husbandry. However, overgrazing is a case because grazing starts with early spring grasses and long-lasting until the winter. Central Anatolian meadows must be grazed for maximum 6 months in a year; however, the grazing lasts for 9 to 10 months. Also, there is high number of animals grazing the country's meadows. The decades-long-awaited Pasture Law provides for arrangements and projects for the solution of the above problems. Of course, it is not expected to improve centuries-long negligence and losses in a very short period of time, however, the implementation projects which involve farmers may bring forth good prospects for the future.

Use of agricultural inputs: In Turkey, the Çukurova and Aegean regions are the two areas where pesticides are highly applied. Overuse and unconscious application of pesticides have adverse impacts on these two regions' flora and fauna. The pesticides have long before left their places to the use of new agricultural methods such as biological combating, integrated pest management and ecological farming, both in Turkey and in several countries in the world.In Turkey, the fertilizer amount per unit area is not high, as in pesticides, compared to other countries. Over use of chemical fertilizers is not common today. However, Turkey might face soil and water contamination problems, which in turn a threat to biological

diversity, in connection with the use of chemical fertilizers in near future. In particular, chemical fertilizers with nitrogen content, which shows a high washing rate, must be seen as a potential threat.

Irrigation: Only a half of Turkey's arable lands are irrigable. In addition, only a half of irrigable arable lands can be irrigated. Even in some parts of Turkey's class I soils that offer the highest yield potential, fallow and non-fallow dry farming takes place. Only a part of those soils, which offers the highest yield, is irrigated. On the first three classes of soils, dry farming takes place with a high proportion, and therefore those soils don't give high yields. Out of Class IV soils, which are the most susceptible to erosion, on 4.5 million ha processed farming takes place. However, the processed farming takes place on 6.1 million ha from Class V to VII, which are not suitable for this kind of farming. On more than half of those farmlands, fallow farming takes place, making soil surface susceptible to erosion. Yet, those marginal lands have low profile depth, and therefore fallowing does not contribute much to annual water accumulation. On the other hand, since most of farms where irrigated farming is applied use the flood method, both the salinisation and acidification of soil and drainage problems appear. Recently, efforts to make widespread dripping and sprinkling methods have been accelerated.

Erosion: Although there has been a moderate level of erosion in previous centuries in Turkey, it has become faster due to improper land usage in the last five to six decades. 73% of Turkey's land is affected by erosion to varying degrees. The soil will become more susceptible to erosion when the soil surface is deprived of vegetation and as the inclination increases, depending on the wind force and precipitation volume. 27.8 million ha of Turkey's soils have an inclination of 12% and below. 12% is recognized as the upper limit of inclination for use as a farmland, provided, however, that appropriate technical measures are taken to this effect. In Turkey, the areas with the above level of inclination are 35.7% of the entire soil surface. Since all the processed soils either as being farmed or planted have a surface area of around 28 million ha, most of farmlands are susceptible to erosion and are losing their yield efficiency. The main cause of the increase of yield at a slower pace despite the technical measures taken is the reduction of natural yield efficiency on the inclined soils. Productive soil layers erode with the loss of more than around 600 million tones soils every year due to the moderate erosion of 20% of soils (15.6 million ha), to the severe erosion of 36% of soils (20.3 million ha), and to the very severe erosion of 17% of soils (13.2 million ha) of Turkey.

Land usage: Turkey's steppes and pastures, so-called herbaceous vegetation cover, is around 21 million ha today. Considering 44,300,000ha and 37,800,000ha steppes and pastures cover of Turkey in 1935 and 1950, respectively, the degree of destruction in this ecosystem can be clearly understood. The major cause of this reduction of steppes and pastures cover of the country is that the steppe areas mainly occur in flat plains, that they are proximate to settlement areas and that they are abandoned. Most of the steppe areas have been turned into farming lands and settlement areas in order to meet the food and accommodation needs of growing population.

A considerable part of the steppes and pastures cover which constitutes 28% of the country's surface area, has been degraded or become unproductive as a result of uncontrolled grazing, unplanned settlement development and industrialization.

Economic policies: Today, the global economic policy that is being tried to be exported to the remaining parts of the world by the industrialized countries pose progressive threats on agricultural biological diversity. Countries are gradually pushed towards agricultural production systems which focus on single product variety and intensive production, and therefore both the local varieties disappear and the food security becomes at risk with the expansion of the mono-cultivation-based agriculture. For example, although there were more than 100 different varieties of apple and more than 600 different varieties of pear in Turkish bazaars 50 years ago, since the appealing races have become widespread, the original apple and pear races have almost been lost today. Modern races do not have the pleasant odor, aroma, taste and deliciousness of original races. Also, the former do not have the latter's genetic diversity that provide resistance to the environmental stress and diseases. That is to say, modern races have faced with genetic degradation. Genetically Modified Organisms' (GMO) becoming widespread insensibly is another progressive threat of the global economic policy on biological diversity. GMOs bring along a risk of genetic pollution for especially the countries like Turkey which are a centre of genetic diversity and origin.

Threats to agricultural biological diversity	Threats to steppe ecosystems
• The inappropriate usage of farmlands • Unsuitable irrigation and farming methods • The unconscious use of agricultural inputs • The cross-breeding of local races with foreign ones • Deficiencies in land registry and cadastre areas	• The destroying effects of infrastructure and superstructure works • The over gathering of plants having an economical value • Wrong and unconscious afforestation • Overgrazing
Common threats to agricultural biological diversity and steppe ecosystems	
• The adverse effects of global economic policies (mono-cultivation in agriculture, GMOs, etc.) • Unplanned and intensive urbanization • Unplanned and intensive industrialization • Soil erosion • Climate change • Bush fire • Wrong mining activities • The non-presence of a meadow rehabilitation and usage management and usage of meadows for farming purposes until '90s.	

Table 5. Threats to agricultural biological diversity and steppe ecosystems

Gaps and Needs

Having regard the importance of Turkey's plant genetic diversity, the National Plan on *In-situ* Conservation of Plant Genetic Diversity was adopted in 1998. The plan determines the legal, institutional and financial requirements for the *in-situ* conservation of the species that are important for agriculture, food, economy and culture (www.bcs.gov.tr). However, an effective system has not been developed for the *in-situ* conservation of agricultural genetic diversity due to gaps in the legislation and to insufficient infrastructure. There is a need also for strengthening the infrastructure for *ex-situ* conservation.

Despite having rich agricultural genetic resources and other medical and aromatic plant genetic resources which offer a very important economical potential, Turkey can use the least of its current potential in improvement, cultivation and production due to insufficient financial resources and gaps in the conservation programme. Another aspect of the issue is the lack of legal and institutional mechanisms that will provide sharing with Turkey of benefits raised from utilization of Turkish genetic resources by other countries.

Most of the local endemic plants living in steppe ecosystems fall into Critically Endangered (CR) category. Also, as read from the Red Book of Turkey's Plants, the habitats of the most of extinct plants are steppes. However, there is a legislative gap regarding the designation of conservation zone in steppe ecosystems. First of all, there is a need for the identification of the would-be zones of conservation from those which represent best of each sub-habitats based on the current studies on the steppe ecosystems with different sub-habitats, and for removing legal and institutional gaps for the design of management plants related to those zones. In addition to these studies, it should be identified how many of the species that have to be conserved on steppe ecosystems are under conservation and whether there is a need for new conservation areas, in the light of scientific data.

On the other hand, some cereals species have gradually become restricted to the narrow farming areas, and therefore they serve no more as a statistics input. Among these species are: the canary grass (Phalaris canariensis); the millet of Milo variety (Sorghum bicolor Moench); Sorghum saccharatum; Panicum miliaceum; and Seteria italica. For the future usage for special ecological and consumption purposes, the genetic resources of this and this kind of species must be protected.

The lack of comprehensive knowledge about the functions of agricultural ecosystems makes it difficult to achieve holistic conservation and sustainability objectives. For example, there are no sufficient biological studies on pollinators. In particular, there is little, if not at all, study showing the relationship between natural species and pollinators. Similarly, the studies on soil biota are insufficient.

The identification and diagnosis of the species specific to steppe ecosystems is a matter of specialization. There is a need to hire more technical staff members who are specialized at steppe ecosystems in the relevant institutions. Since these ecosystems bear importance in terms of genetic diversity, more importance must be attached to increasing the number of researchers of genetic resources and to the improvement of infrastructure and facilities for the research and conservation of genetic diversity.

1.4.2. Threats to Forest and Mountain Biological Diversity and their Causes

Mountain ecosystems include wetland, forest and steppe ecosystems, and therefore any pressure on those ecosystems in turn becomes a threat to mountain ecosystems. On the other hand, high proportion of the forests of Turkey exists in mountainous regions. Therefore, these two ecosystems considered together in terms of threats on their biological diversity. The factors that cause the loss of Turkey's mountain and forest biological diversity include:

- The excessive use of forests in mountain ecosystems without considering their bearing capacity both at ecosystem and species levels (hunting, grazing, lumbering, visitors, in-forest constructional activities, etc.);

- The impacts of atmospheric pollution and global climate change;

- Pressures arising from the dependency of communities living in and around forests on agricultural and forestry products (livestock, uncontrolled use, gaining farmlands and forest fires) and the insufficient number of income-generating programmes;

• Increasing construction due to tourism incentives, uplands tourism, the high number of visitors in the archaeological sites, and other tourism activities exceeding the bearing capacity;

• Alien species;

• The over gathering of plants having an economical value;

• Wrong mining activities;

• Wrong and unconscious afforestation.

• Taking forests out of the forest regime;

• The destroying of forests for gaining farmlands;

• Forest fires;

• Destruction by insects;

• The uncontrolled taking of flora and fauna samples.

Gaps and Needs

The main obstacles to the conservation and sustainable use of mountain and forest biological diversity can be the lack of sufficient coordination between institutions regarding biological diversity studies, the non-completion of inventory studies, the non-completion of the setting up of a national database and monitoring unit yet, the insufficient number of experts and technical staff in the relevant institutions, and the most important of all, the lack of resources. Although the ratio of conservation zones to the country's surface area has shown an increase in the recent years, this has not reached at the desired level, yet. The biological diversity inventory of conservation zones and of mountain ecosystems, which are many in numbers, has not been completed.

The relevant institutions do not allocate much from their budgets to biological diversity conservation activities, which vary from planning to programming.

There is a need to design administration and conservation plans that should be integrated with biological diversity conservation for mountain ecosystems and high-mountain steppe ecosystems.

The coordination among the relevant institutions is not at the desired level, and therefore tourism activities give damage to biological diversity, and the targets set for sustainable use, i.e. the protection of herbaceous and ligneous genetic resources cannot be achieved.

The insufficient number of technically qualified/specialized staff is one of the major constraints in the implementation of the conservation programmes in Turkey.

There is a need to make widespread integration of the targets set for biological diversity conservation with forest management planning process and with administration plans, and to

implement similar practices in such a manner that these can be expanded to cover non-forestry products. Also, there is a need to provide technical training to plan executors.

1.4.3. Threats to inland waters biological diversity and their causes

The threats to inland waters biological diversity can be the occurrence of alien species, excessive or illegal fishing, pollution, the illegal hunting of birds, reptiles and their young or the gathering of their eggs, excessive grazing, the destruction of habitat, the uprooting of aquatic plants, the burning of reeds and uncontrolled cutting of them, secondary buildings, sedimentation, pressure from tourism, and interventions to the water regime. The domestic and industrial wastewaters cause the contamination of inland waters, changes in food chain, and the degradation of water quality.

The introduction of alien species into inland waters lead to irrecoverable changes in the natural inland waters biological diversity of the country. For example, the pike-perch species released to the Lakes Beyşehir and Eğirdir has caused the endemic Phoxinellus and P. Handlirschi species to become extinct.

Climate change's impacts brought along with global warming with impacts felt more day by day and the resulting new practices that must be implemented in water sources utilization and management (e.g. the increased utilization of groundwater, increased utilization of inland waters resources as either drinking or irrigation water) will pose a major threat to the sustainability of many inland waters ecosystems.

Gaps and Needs

The main constraint to the conservation of inland waters biological diversity and its sustainable use is the population pressure which comes either directly or indirectly on water resources. The fact that water resources are invaluable for human beings in meeting fundamental needs as well as their main function in particular in agricultural, energy and industrial investments and the development process is a considerable challenge in striking a balance between conservation and utilization. Since Turkey is still a developing country and there exists a failure to integrate biological diversity issues with other sectors and to build a common understanding on this and the insufficient level of economic incentives, it becomes more difficult to strike such balance. There is a need to undertake a progressive modeling, by which the adverse changes in the ecosystem can be demonstrated, in wetlands investments which seek public benefit.

The insufficient number of academic researches, the lack of experience and technology transfer, and the insufficient human resources and technical facilities for monitoring and supervision are some major constraints with regard to the improvement and implementation of conservation and sustainable use measures. At the lakes and streams at high altitudes, the inventory studies have been limited, except for those on fish species. To achieve wise use of Turkey's inland waters resources in the future, there is an urgent need for a detailed inventory, works for identification of quality and dedicated-to purpose bearing capacity, mapping and gap analysis.

Although SHW's planning studies and practices suit to the "basin management approaches to inland waters ecosystems conservation and utilization planning", the criteria and indicators are still incomplete. The integrated land and discharge basin management approach should be made widespread.

1.4.4. Threats to coastal and marine biological diversity and their causes

The threats to coastal and marine biological diversity can be listed as the introduction of invasive alien species, over fishing, illegal fishing, pollution, the destruction of habitats and tourism activities.

The coastal sand-dunes are the ecosystems that have become sensitive and vulnerable to destruction, even at some parts have been destroyed, due to the pressures of human origin in Turkey, as in the world. Because of coastal erosion caused by road construction works, afforestation, sand hauling, secondary buildings and tourism investments, currently only 30 (27%) of 110 coastal sand-dunes on the Mediterranean and Aegean coasts are relatively in good condition.

Since the calcareous algae and mollusks-larva terraces are found in coastal areas, they are affected from the activities of human-origin like pollution, rip rapping for gaining beach, coastal constructions and erosion. Studies on the lithophyllum formations of the Mediterranean demonstrate that pollution can give harm to algae and therefore cause erosion. Following the eutrophication, green algae species such as ulva cover the terrace surface and compete with each other and cause bioerosion and the resulting destruction of calcareous algae like lithophyllum, which are valuable formations.

The Black Sea ecosystem, which is well-known with its rich biological diversity and fish potential, has become so degraded today due to a number of climatic factors as well as to the factors of human origin in the last 20 to 30 years. Major factors of this kind include: terrestrial pollution from the countries bordering both the Black Sea and the River Danube which has increased in the last twenty-five years; the invasive alien species and some non-nutrient organisms carried to the Black Sea from other seas by shipping business which then have become dominant in the ecosystem and changed the biological structure; over fishing with the rapid technological advancements in the fisheries sector and the resulting reduction of fish stocks. Among the above factors, the pollution poses the highest risk. Because the Black Sea has one of the biggest hydrogen sulphur (H_2S) reserves in the world, and the bacteria in the sea takes oxygen from sulphur ions instead of solved oxygen due to excessive euthrophication, there is the risk of degradation of the two-layer water body and of the passing of hydrogen sulphur at the bottom to the explosive phase and there resulting in an environmental disaster. Another significant threat comes from alien species. A total of 48 alien species were identified in the years between 1996 and 2005 in the Black Sea. Of those species, Mnemiopsis leidyi and Rapana thomasiana have the biggest adverse impact on anchovy stocks and mussel stocks, respectively. Organochlorine pollutants of PCB and DDT type have been found at the threshold levels on dolphin species. On the other hand, the sea mammals are under threat due to the pollution in the Black Sea and by-catch. The endangered monk seal has almost completely been lost in the Black Sea as a result of genetic isolation and the destruction of its habitats.

Another major threat to the Black Sea ecosystem is the sea transport and accidents in the Turkish Straits. The accidents in the Turkish Straits, where there is more intensive marine traffic than the other straits in the world, can be attributed for the great part to the navigational errors of vessels/tankers due to poor visibility and strong currents. In recent years, not only the frequency of vessel traffic has increased but also the size of vessels and the nature of cargoes have drastically changed. The ratio of oil, oil products and other dangerous and

hazardous materials transported by large tankers has been rapidly increasing. Indeed, the number of oil tankers and other dangerous cargo vessels passing through the Strait of Istanbul rose by % 90 in the last 7 years alone from 4248 in 1996 to 10.054 in 2007. Similarly, the amount of hazardous cargo increased from 60.1 million tons in 1996 to 143.9 million tons in 2007, with an increase by % 130. The figures for the Strait of Çanakkale are similar. With the marine traffic becoming more intensive constantly, an increase in the number of accidents, a higher environmental risk, and possibly higher numbers of alien species carried to the Black Sea in tankers' ballast waters should be expected.

In the Aegean and the Mediterranean, main pressure on the coastal and marine ecosystems comes from tourism and industrialization processes. The over pumping of water, pollution, the displacements of water flow directions, and natural threats like earthquake, settlement, abrupt flood can be counted among the major factors that cause the destruction of sea caves and the extinction of marine organisms.

Gaps and Needs

Although some Special Environmental Conservation Zones, i.e. the Special Environmental Conservation Zones of Foça, Gökova, Datça-Bozburun, Köyceğiz-Dalyan, Patara, Kaş-Kekova, Belek, Göksu Delta, have been designated along the Turkey's shoreline, there is a need to designate more areas as Special Environmental Conservation Zone and marine conservation zone, e.g. underwater national parks, to devise management plans for those areas, and to designate strict conservation zones. There are gaps at the legal and institutional levels with regard to the designation and management of marine conservation zones.

Below is a summary of the gaps regarding the sustainable use of coastal and marine resources:

• Biological diversity issues disintegrated with other sectors and the lack of common understanding (failure to take measures to minimize the adverse impacts of fishing practices on the fishery stocks in the marine and coastal ecosystems, etc.);

• Insufficient capacity to take action due to institutional weakness;

• The insufficient financial, human and technical resources (being unable to use developments in fishing technology for a multi-dimensional sustainable use of fish resources, the non-presence of inventories of fishing technology and fishing gears, insufficient research works on the identification of fishery stocks and on sustainable fishery, insufficient technical capabilities for protection/control/monitoring, etc.);

• The Lack of benefit-sharing (the lack of cooperation with the international fishing and marine sciences committees, failure to stop the pollution of the Black Sea and the small number of international attempts to protect biological diversity in the area below the desired level, etc.);

• Population pressure (support to the alternative livelihoods of people being not at the desired level, over and unplanned constructional activities on the coasts, etc.).

Below is a summary of the needs for the sustainable use of coastal and marine resources:

• An inventory of marine and coastal flora and fauna should be built up to collect available information; any lacking information should be completed; and more resources should be allocated to maintaining inventory studies concerning marine and coastal biological diversity.

• Measures should be taken to ensure information exchange, cooperation and coordination between experts, laboratories and organizations; guides should be prepared; the participation of those experts in the international studies should be ensured.

• Studies concerning the conservation of sea grasses (*Posidonia oceanica*), which have a very important role for the marine organisms in the Mediterranean Sea and have a wide occurrence, should be maintained and both short- and long-term scientific monitoring methods should be developed for other important species and plant categories.

• Information booklets and documents should be prepared for the executives, related groups and public on the endangered species and the Specially Protected Areas, and people's awareness should be raised by using visual media.

• Sea aquariums should be built in big coastal towns and in the ecologically-sensitive regions of Turkey in order to contribute to the training of wider communities and establishing a marine culture in the country.

• Effective methods for the identification and observation of alien species should be developed and implemented; regulations on the entry of alien species into the new ecosystems, in particular, should be reviewed and made compatible with the international conventions; and strict controls should be exercised to prevent foreign invasive species from entering Turkey's waters both at the national and international levels.

• Measures should be taken to minimize the adverse impacts of fishing practices on the fishery stocks in the marine and coastal ecosystems; fishing control infrastructure, e.g. remote monitoring system, should be strengthened.

• An inventory of fishing technology and fishing gears should be built up, first at regional and then at the national levels.

• Research projects, which will establish a fishing structure that will not give any harm to the existing fishery stocks of the country and which will identify catch amounts on species and fishing gear bases should be designed in the shortest time possible, and such initiatives of project designing should be supported.

• The populations of species which were affected from over fishing pressure and had a fall in their populations should be restocked by means of aquaculture.

• Artificial reef application should be made widespread.

• With regard to aquaculture, off-shore cage culture should be supported with a view to protecting the environment.

• Regulatory actions should be taken to protect the sea caves of Turkey and conserve the organisms in those caves, and conservation and utilization models should be established.

1.4.5 Cross-cutting Issues

1.4.5.1 Access to genetic resources and benefit-sharing

Current Situation
Below is a list of the current regulations on the access to genetic resources and benefit-sharing in Turkey:

• Those foreign researchers who will do researches in Turkey are subject to the Requirements for those Foreigners or those applying on behalf of Foreigners and for Foreign Members of the Press who will Do Scientific Research and Examination and Record Film in Turkey, which were put into force by the Resolution of the Council of Ministers No. 8/12839 of 4 April 1988. By the Resolution of the Council of Ministers No. 2003/6270 of 6 October 2003 amending articles 2, 3 and 7 of the above-cited Resolution of the Council of Ministers, the authorization to issue research permits other than those concerning archeological excavations and surface researches was granted to the relevant authority. Therefore, the MEF receives and finalizes any applications for research permits for living natural resources. The permits do not entail gathering materials and taking samples from the wild. Where a research entails gathering materials from the wild, there will arise a necessity for different regulations by different agencies depending on the categories of living things.

• For the research and gathering from the wild of the specimen of flora, fauna and aquatic organisms, the authority is granted to the MARA pursuant to the Regulation on Gathering, Storage and Utilization of Plant Genetic Resources, which was entered into force upon its publication on the Official Journal No. 21316 of 15 August 1992, to the Regulation on the Protection of Fauna Gene Resources, which was entered into force upon its publication on the Official Journal No. 25145 of 21 June 2003, and lastly to the Fisheries Regulation, which entered into force upon its publication on the Official Journal No. 22223 of 10 March 1995.

• The catching and hunting of terrestrial wild animals and their eggs and larvae from the wild is prohibited pursuant to the Regulation on Procedures and Requirements for the Protection of Hunting and Wild Animals and their Habitats and combat with Pests (Article 10), which was entered into force upon its publication on the Official Journal No. 25976 of 24 December 2005. For the purposes of scientific research and training, the catching and hunting of wild animals and the gathering their eggs and larvae from the wild can be permitted in accordance with the relevant provisions of the above-cited regulation. However, such scientific activities should not damage the continuity of population in the natural occurrence of the species.

Turkey fulfill its obligations concerning access to genetic resources and benefit sharing as a member of the European network (EUFORGENE) for Forest Trees, and obeying the Material Transfer Agreements on access to genetic resources. Turkey has very restricted access to other countries' genetic resources in agriculture and forestry sectors and this access is based on agreements on material transfer and therefore Turkey shares benefit with the resource-provider country.

Gaps
Since the sharing of benefits from genetic resources is directly related with taking measures to ensure the conformance of access countries to the provisions of the Convention, the measures

taken at the national level is not sufficient alone. As a result, foreigners can access and transfer genetic resources illegally.

The lack of an effective international mechanism, involving sanctions against biological material smuggling, as well, the insufficient number of technical equipment, the use of which will facilitate to detect rapidly any biological materials at the customs gates, the failure to keep records of genetic resources and to monitor them due to technical incapability are some of the significant issues.

1.4.5.2 Alien species

Current Situation
The Agricultural Combat and Agricultural Quarantine Law 6968 of 15/05/1957 and Animal Health and Surveillance Law 3285 of 08/05/1986 are the two important laws provide necessary base for border controls for both the health control and protection of species entering/exiting Turkey. International quarantine and health certificate practices for biological material transfer are legal requirements and constitute one of the control mechanisms. Also, any gathering and transfer of living things are subject to the MARA regulations.

A permit from the MARA is required for selling, transporting and catching in harvesting areas, gathering, handling at any plants, releasing into water of fish, their broodstocks, fry, larvae, juveniles and spawners, as well as aquatic plants in order to ensure the nationwide control of fisheries production in accordance with the Communiqués on Commercial Marine and Inland waters Capture Fisheries Production, which are renewed every year under both the Fisheries Law and Fisheries Regulation. The Communiqués on Marine and Inland waters Recreational (Sport) Fishing classify both ecologically-unfavorable inland waters fish and potential ecologically unfavorable inland waters fish and prohibits release of the fish of this class into rivers and lakes in an uncontrolled manner and without permission, use them as a live bait and the transportation of them from one place to another for the same purpose.

With a Draft Bill on the Amendment of the Fisheries Law, it is expected that the release of any alien species into water resources will be prohibited, unless this action is taken with the permission of the MARA.

The Maritime Undersecretariat continues its efforts to prevent the carrying of alien species in ballast waters.

Gaps
In Turkey, only the main alien species that have newly and recently entered the country have been identified; however, no tracking of the past entries is in place currently. There is no system which will enable the monitoring of alien species entries into Turkey has been set up. The only species monitored is Caulerpa, a foreign alga species, and this takes place only at the local level.

The risks posed by the alien species on ecosystems, habitats and species have been identified for only some alien species. Some alien species, e.g. Caulerpa racemosa and Minemiopsis leidyi, have been a subject of some studies.

Turkey has established regional cooperation mechanisms concerning the invasive alien species, although these are small in number. However, Turkey could implement only a part of

the guidelines on the alien species, which threaten ecosystems, habitats or species. For example, although national biological diversity strategies and action plans have been devised, regarding the invasive alien species, these have not been integrated into the sectoral and cross-sectoral policies, since the designation of the coordinating institutions is at an early stage.

A sufficient capacity should be built to enable making risk assessment and analysis on the threats to biological diversity by the invasive alien species, and integrating the related methodologies into the Environmental Impact Assessment (EIA) and Strategic Impact Assessment (SIA).

1.4.5.3 Incentives

Current Situation
There are no special incentive programmes for the conservation and sustainable use of biological diversity. However, the SPO's Development Plans and Annual Programmes establish measures and policies which in a way work as incentives for the conservation and sustainable use of biological diversity. In addition, the Undersecretariat of Treasury establishes and implements incentives for the prevention of the environmental pollution based on Article 29 of the Environmental Law upon the recommendation from the Ministry.

Gaps
The lack of financial, human and technical resources as well as economic incentives and policies and legislation dedicated to purpose is identified as constraints to and gaps for the implementation of incentives for biological diversity conservation and sustainable use. Some incentives implemented in other sectors can have adverse impacts on biological diversity. For example, despite the known adverse impacts of the Tourism Incentives Law on biological diversity and in particular on the coastal ecosystems, a full coherence of the development policy with the conservation policy could not be achieved since the tourism is a sector open to development. However, the Special Environmental Conservation Zones of Belek, İztuzu and Ihlara are good examples to that coherence (between tourism and environmental conservation).

The local administrations need funding to be able to effectively implement sustainable tourism activities with the cooperation of voluntary organizations.

1.4.5.4 Monitoring and Indicators

Current Situation
The conservation zones (6%) in the entire country are monitored at the ecosystem level. The regular monitoring of the species listed in the Hunting and Fisheries Laws is in place at the species level. A national monitoring unit has been established in the MEF to perform monitoring at both the species and ecosystem levels, and it is currently gaining effect.

The MEF conducts controls and investigations at the local level under the Regulation on the Environmental Impact Assessment and monitors any activities that may have adverse impacts on the environment and takes measures to remove the impacts to the greatest extent possible. Also, any activities that may have adverse impacts on the monk seals and sea turtles (sand

hauling from the sea, fishing, industrial wastes, etc.) are followed up under the monitoring programmes implemented for the two species, which are endangered.

Climate change is monitored by means of meteorological data and air quality parameters. Pollution/euthrophication is monitored by means of regular controls by local authorities. Land changes and degradation throughout the country are monitored via a Central Remote Monitoring System.

Turkey's Plants Data Service of TÜBİTAK (www.tubitak.gov.tr/tubives) established coordination partly in data collection and management concerning plants. Turkey Biological Diversity Information System Project, TUBIOS, was initiated in 2003 to improve the system in such a way so as to fully cover biological diversity with all aspects.

Gaps
There are difficulties in standardized and systematized data collection and management. The data in various institutions and non-governmental organizations which have been prepared for different purposes should be transferred to national databases. The lack of coordination and cooperation is observed among national databases which are important for the updating of and benefiting from biological diversity data.

The lack of accessible available information, the poor level of the available scientific and traditional information use, the lack of financial, human and technical resources, and the lack of commitments from the academia are challenges to developing indicators and implementing a systematized monitoring programme.

1.4.5.5 Environmental Impact Assessment

Current Situation
The EIA Regulation has been issued based on the related article of the Environmental Law and is currently being implemented, going through regular revisions to adapt to current conditions. The factors causing a reduction in biological diversity are dealt with in the sectoral investments and measures regarding those factors are motivated under the EIA Regulation.

The Annex to the Regulation classifies EIA requiring activities as the Projects for which an EIA will be implemented and the Projects for which Selection and Elimination Criteria will be implemented. The activities under the first group of projects are evaluated by the MEF central administration, while those under the second group of projects are evaluated by the local administrations of the MEF.

New regulation is being prepared for a comprehensive SIA.

Gaps
The activities are evaluated on case basis since the biological diversity data at the genetic diversity level, in particular, is not sufficient in Turkey. Strategic evaluation is restricted and can only be made in certain situations based on the complaints raised either at the meetings aiming at ensuring public involvement in the EIA process or communicated to the local administration.

The environment-related issues do not receive much attention during the decision-making process due to the priority development issues, economic constraints, and increasing need for

resource and investments in connection with the rapid population growth. Although sustainable use understanding tends to become widespread in the sectoral applications, there are practical difficulties arising from development needs. The lack of awareness concerning biodiversity loss, together with the loss of benefits from it, and the failure in documenting the loss also is a challenge to application.

1.4.5.6 Liability and Redress

Current Situation
Article 28 of the Environmental Law 2872 brings forth an approach, which envisages that the private or legal person giving damage to the environment should be held responsible with no negligence provison. Further, the liability of recompensing the losses occurred as a result of damages to the environment is reserved in accordance with general provisions under the cited article.

Considering the conservation of biological diversity and the ecosystems having biological diversity as specified in article 6 of the Law 5491 of 24/04/2006 amending the Environmental Law within the framework of revision to the latter, article 14 of the cited law imposes administrative penalties regarding damages to biological diversity.

Furthermore, regulations on special issues bring forth sanctions regarding liability and compensation, in support of biological diversity conservation and sustainable use. The Hunting Law (4915-01/07/2003) and Fisheries Law (1380-04/04/1971), both laying down the sanctions to be imposed in the event of any breaches of hunting and fishing bans; the National Parks Law (2873-09/08/1983) and Law on the Protection of Cultural and Natural Assets (2863-23/07/1983), both laying down the sanctions to be imposed in the event of any breaches of regulations and bans in conservation zones; the Forest Law (6831-31/08/1956), laying down the sanctions to be imposed in the event of forest damage; the Coastal Law (3621/3830-04/04/1990), laying down the sanctions to be imposed in the event of any breaches of coastal regulations; and the Law on Soil Protection and Land Use (5403-03/07/2005), laying down the sanctions to be imposed in the event of farmlands use out of purpose are all examples to the above.

Gaps
Since currently it is not known to what degree damage is given to biological diversity, the punitive sanctions imposed by the Law cannot be fully implemented. There is need for the specialized lawyers at this area.

1.4.5.7 Education and Awareness-raising

Current Situation
The MEF and the Ministry of National Education conduct regular training and awareness-raising activities. A national strategy which urges public awareness-raising and involvement under the Biological diversity and Resource Management, a GEF-financed project, has been developed. This is followed by a strategy and action plan which urges capacity building of NGOs concerning biological diversity under the same project. The national biological diversity website is constructed both in English and Turkish. On the other hand, NGOs from the environmental sector play a significant role in public-awareness raising and enhancing their sensitivity.

Gaps
There is a need for more financial resources and a better coordination mechanism between institutions for an effective implementation.

1.4.5.8 Technology transfer

Current Situation
Turkey opens its available technology to the developing countries' access through either bilateral and regional agreements or joint programmes. However, Turkey needs technology transfer with regards to clean and environment-sensitive technologies, in particular.

Gaps
Turkey cannot make use of technology transfers which will support either directly or indirectly biological diversity conservation and sustainable use because of the fact that the other countries do not take actions that facilitate technology transfer, that no access is made to the technologies owned by the private sector, and that no technology transfer is in place to support research and development fitting to Turkey's needs.

CHAPTER II: CURRENT STATUS OF NATIONAL BIOLOGICAL DIVERSITY STRATEGY AND ACTION PLAN

2. NBSAP 2008-2018

The National Biological Diversity Strategy and Action Plan (NBSAP) was prepared in 2001 under the coordinating role of the Ministry of Environment, with the intention that it should serve as a guide in implementing the Convention on Biological Diversity in harmony with other obligations and in solving the problems caused by the loss of biological diversity. However, the need emerged to update the NBSAP in the light of the changing national and international conditions and trends and the progress recorded under the Convention since 2001. More than 100 representatives and experts from relevant governmental agencies, non-governmental organizations and universities as stakeholders in the conservation, management and use of biological diversity participated in and contributed to the process of updating the NBSAP. With these representatives and experts, national workshops were held on a participatory basis and activities conducted in thematic groups on agricultural, steppe, mountain, forest, coastal and marine, and inland water biological diversity. Following the activities conducted under the leadership of a team of specialists who provided scientific and technical consultancy to the process, the data concerning Turkey's biological diversity and the information concerning the institutional and legal infrastructure were updated, the goals for the conservation and sustainable use of biological diversity were ranked by priority, and the strategic goals and roadmap were determined. In addition, the obstacles and gaps standing in the way of achieving the priority goals, the inconsistencies in practices, and the requirements to be met for achieving the goals were identified.

The NBSAP is intended to identify and assess Turkey's biological diversity in brief, to determine an agreed strategy for conservation and to present decision-makers with proposals for action required for achieving the goals of biological diversity conservation in Turkey. The NBSAP should be regarded as a dynamic tool which may be renewed and updated as the

goals are reached and the conditions change. The following issues have strategic importance in achieving the objectives of the Convention on Biological Diversity:

- Identifying the indicator species those are important for biological diversity, making inventories of species, populations and ecosystems, and effectively implementing the monitoring and classification system

- Identification, recording, protection and management of the elements of genetic diversity those are important for biological diversity, agriculture, food and economic values

- Establishing a central information management system to enable the sharing of research results for application by decision-makers, users and other stakeholders and a more rapid analysis and distribution of biological and biophysical data

- Developing special protection measures with priority given to fragile, threatened and endangered species and ecosystems, to critical habitats, to classification groups on which very little work has been done, to classification groups that have economic value, to areas with a high level of diversity, and to regions where damage caused by rural and urban development and human activity has occurred most widely.

- Determining and monitoring the impacts of climate change on biological diversity and taking measures to protect the most affected ecosystems and species from these impacts.

- Identification and conservation of special, fragile mountain ecosystems and other biological diversity hot points and of the species that accompany them

- Ensuring the links and coordination between the implementation processes of the National Biological Diversity Strategy and other relevant national initiatives such as agricultural strategies or national development plans.

- Promoting the sustainable use of biological resources and eliminating or minimizing the negative effects of resource use on biological diversity

Coordination is the primary shortcoming that needs to be eliminated on the road to achieving the strategic goals envisaged for effective conservation and sustainable use of biological diversity. For this reason, issues related to coordination and financial resources are addressed as the tenth objective of the Strategy. In the area of human resources, lack of skilled personnel is noticeable. With regard to infrastructure, although the categories of goals have different requirements, it is noted that infrastructural requirements have a key role in achieving the goals of identifying, protecting and recording genetic resources. With regard to legislation, gaps have been identified in some areas, and a lack of implementation and enforcement in others.

Starting from the current state of biological diversity in Turkey, the trends, the priorities and the gaps analysis, 10 objectives have been defined under the three goals of the Convention on Biological Diversity. Three of these objectives are considered to have priority, by all the thematic working groups and therefore address all the thematic areas. The common strategic goals for the thematic areas have been brought together under these three objectives, and the

actions regarded as critical for achieving these goals have been defined. Under the other 6 objectives are listed those goals which both are considered by each thematic area to have priority for itself and must be addressed in the scope of that thematic area for achieving the common goals. Under these goals defined for the particular thematic areas, actions that support again both the goals of the thematic area and the common goals have been determined, including actions towards capacity-building in view of the needs identified in the gaps analysis. The defined tenth objective aims at solving the problem of cooperation and coordination in particular. The capacity requirements identified in the gaps analysis and to play a key role in the implementation of the NBSAP are also reflected in the actions under this objective.

The goals and objectives of the Strategy are presented below:

GOAL 1: To identify, protect and monitor biological diversity components which have importance for Turkey:

Objective 1.1 To develop and implement biological diversity inventory and monitoring methods and programmes, by considering rapid assessment methods and biological diversity indicators as well, in order to determine and monitor any changes in ecosystems, species and genetic diversity,

Objective 1.2 To include the less-represented ecosystems, species and genetic diversity centers into protected areas of both terrestrial and aquatic ecosystems, and to achieve an effective protected area management,

Objective 1.3 To prevent or minimize as far as possible any pressures on and threats to biological diversity,

GOAL 2: To use biological diversity components in a sustainable manner by applying the methods and at a level fitting to their renewal capacity by taking the future generations' needs into account,

Objective 2.1 To establish harmony among legal, administrative and institutional regulations and applications having relevance to the conservation of biological diversity and sustainable use of its components,

Objective 2.2 To develop and put into practice the ecosystem-based planning and management systems for the purposes of the biological diversity conservation and the sustainable use of biological resources,

Objective 2.3 To raise public awareness and sensitivity concerning the conservation and sustainable use of biological diversity,

GOAL 3: To identify, protect and benefit the components of genetic diversity, including the traditional knowledge, which have importance for Turkey,

Objective 3.1 To identify, record, protect and manage the components of genetic diversity which have importance in terms of biological diversity, agriculture, food and economic value,

Objective 3.2 To control access to genetic resources and guarantee the sharing of the benefits arising out of the utilization of these resources with Turkey,

GOAL 4: To identify, protect and monitor the components of biological diversity which have importance for agricultural biological diversity; to protect genetic resources which have actual and potential values for food and agriculture, and to ensure the sustainable use of such resources; and to ensure the fair and equitable sharing of the benefits arising out of the utilization of genetic resources,

Objective 4.1 To identify, protect and monitor the biological diversity elements which have importance for agricultural biological diversity,

Objective 4.2 To develop management applications and technologies as well as policies which support the positive impacts of agriculture on biological diversity, on one hand, and minimize its adverse impacts, on the other hand, and to increase yield from agricultural ecosystems and its capability to sustain as a source of livelihood,

Objective 4.3. To prevent or minimize as far as possible any pressures on and threats to agricultural biological diversity which come from the genetically Modified organisms (GMO's) and the alien species,

Objective 4.4. To ensure conservation and sustainable use of genetic resources which have actual and potential values for food and agriculture; and to ensure the fair and equitable sharing of the benefits from the utilization of genetic resources,

GOAL 5: To protect steppe biological diversity, to ensure the sustainable use of its components, as well as to ensure the fair and equitable sharing of the benefits from the utilization of genetic resources; and to combat against the loss of steppe biological diversity and the socio-economic results of that,

Objective 5.1. To fill the information gaps concerning steppe biological diversity,

Objective 5.2. To identify ecological, physical and social processes such as grazing, drought, desertification, aridity, salinity, flood, fires, tourism, agricultural transformation or abandonment which have adverse impacts on the biological diversity of steppe ecosystems and mainly on the ecosystem structure and function, and to take measures regarding the above,

Objective 5.3. To establish mechanisms and frameworks in order to support the fair and equitable sharing of the benefits from the utilization of the genetic resources of steppe areas,

GOAL 6: To establish an effective monitoring, management and coordination system for the conservation of forest biological diversity and the sustainable use of its components,

Objective 6.1. To develop and put into practice the monitoring programmes for better evaluation of the status and tendency of forest biological diversity,

Objective 6.2. To establish appropriate mechanisms for a more effective conservation and sustainable use of forest biological diversity,

GOAL 7: To establish an effective monitoring, management and coordination system for the conservation and sustainable use of mountain biological diversity, together with its different ecosystems, pursuing a holistic approach:

Objective 7.1. To effectively implement biological and ecological inventories, monitoring programmes and classification systems,

Objective 7.2. To establish appropriate mechanisms for the conservation and sustainable use of sensitive mountain ecosystems,

GOAL 8: To develop and implement effective methods for the conservation of inland waters biological diversity, the maintenance of ecological functions of inland waters ecosystems, and the sustainable use of these ecosystems:

Objective 8.1. To strength technical and institutional capacity for the conservation and sustainable use of inland waters biological diversity,

Objective 8.2. To take actions for the conservation and sustainability of inland waters biological diversity and reduce threats to it,

GOAL 9: To develop and implement effective methods for the conservation of coastal and marine biological diversity, the maintenance of ecological functions provided by coastal and marine ecosystems, and the sustainable use of these ecosystems:

Objective 9.1. To strengthen the necessary administrative, legal, institutional and technical capacity for the identification, monitoring, conservation and sustainable use of coastal and marine biological diversity,

Objective 9.2. To fill the information gaps concerning coastal and marine biological diversity, to identify and put under conservation the areas and species which have importance for biological diversity and are under threat, and to develop and implement monitoring programmes,

Objective 9.3. To combat with the threats to coastal and marine biological diversity.

GOAL 10: To establish a mechanism for the implementation of the Biological Diversity Strategy and Action Plan and the follow-up of implementation and reporting:

Objective 10.1 To establish coordination among relevant institutions as regards the conservation and sustainable use of biological diversity,

Objective 10.2. To achieve the integrity and sustainability of financial structures for the identification, conservation and sustainable use of biological diversity.

CHAPTER III: SECTORAL AND CROSS-SECTORAL INTEGRATION

3. INTEGRATION OF BIODIVERSITY INTO POLICY, LEGISLATION AND PLANS

3.1. THE CONSTITUTION

Article 63 of the Constitution states that the State shall protect historical, cultural and natural assets and take supporting measures for this purpose. This Article also provides for the conservation of species in their natural environments. In addition, even if they are not directly intended for the conservation of biological diversity, there are the provisions for environmental protection in Article 56, the limitation introduced by Article 35 on the exercise of private ownership in view of public benefit and the provisions in Article 44 concerning the efficient use of land, in Article 45 concerning the prevention of the use of agricultural land, meadows and pastures for other purposes and in Article 169 concerning the conservation and development of forests, thereby securing the conservation of biological diversity through legal sanctions.

The fact that Turkey is party to international conventions aimed at the conservation of biological diversity is a reflection of its nature conservation policy.

3.2. NATURE CONSERVATION POLICIES, STRATEGIES, PLANS AND PROGRAMMES

Importance has been attached to the conservation of the natural environment since the early years of the Republic. The designation of the first National Park in 1958, when environmental problems were not yet intensive in Turkey, reflects a well-established approach to nature conservation. In the 1970s, when human pressure on the environment was beginning to rise in the world and in Turkey, environmental conservation policies started to become institutional in Turkey. The General Directorate of Environment, established in 1984 as a body affiliated to the Prime Ministry, was converted in 1989 into the Undersecretariat of the Environment and later replaced by the Ministry of the Environment in 1991. In 2003, the Ministry of the Environment was merged with the Ministry of Forestry and renamed as the Ministry of Environment and Forestry.

It is the responsibility of the MEF and its affiliated organizations to formulate the policies concerning the conservation and sustainable use of the environment and biological diversity, to designate and manage protected areas under various statuses, to develop and implement plans and programmes, to carry out activities in this scope and to ensure coordination among different institutions. These duties and responsibilities are performed through the central and provincial units of the Ministry and its affiliated organizations.

The Ministry's unit with primary authority and responsibility for the conservation and sustainable use of biological diversity is the General Directorate of Nature Conservation and National Parks, which is also the CBD focal point.

The institutional structure and relevant legislation concerning biological diversity is given in Annex 1.

National environmental strategies, plans and programmes are as follows:

• National Environmental Action Plan (1998)

• National Plan for In-Situ Conservation of Plant Genetic Diversity (1998)

• National Biological diversity Strategy and Action Plan (2001)

• National Agenda 21 Programme (2001)

• National Wetland Strategy (2003)

• Turkish National Forestry Programme (2004)

• National Science and Technology Policies 2003-2023 Strategy Document (2004)

• Turkish National Action Programme Against Desertification (2005)

• National Environmental Strategy (2006)

• National Rural Development Strategy (2006)

3.3. DEVELOPMENT PLANS

Starting from the Fifth 5-Year Development Plan, which covered the years 1985 to 1989, the environmental sector was included in national programmes as part of development plans. The subsequent Development Plans and Annual Programmes have included issues of biological diversity in the environmental and agricultural sectors, set forth policies for the conservation and sustainable use of biological diversity and for the augmentation of its economic value, and specified the necessary measures. The Ninth Development Plan, covering the years 2007 to 2013, determines as a priority to carry out activities for the conservation and development of and the addition of economic value to the biological diversity that Turkey has. The Plan states in point 459 that "the activities for the investigation, conservation and evaluation of and the addition of economic value to the biological diversity and genetic resources of Turkey will be accelerated" and in point 508 that "the aim is to protect the natural forest ecosystem effectively against various threats, especially fires and pests, and to manage it in a multi-purpose and effective fashion, considering the conservation-utilization balance, biological diversity, gene resources, forest health, and the development of non-wood products and services and eco-tourism".

3.4. SECTORAL POLICY

The first 4 items of the final declaration of the 2nd Agricultural Council, which took place in 2004 under the coordination of the Ministry of Agriculture and Rural Affairs, urged the preparation of a natural resources inventory, taking measures to prevent erosion, pollution and unsustainable of natural resources, the conservation of genetic resources and biological diversity, and the completion of meadow rehabilitation work. The final declaration proved that the themes of conservation and sustainable use of agricultural biological diversity and steppe ecosystems have been incorporated in the plans and policies of the agricultural sector. The National Rural Development Plan has mentioned of biological diversity conservation objectives.

The Decree-Law on the Establishment and Functions of the Ministry of Agriculture and Rural Affairs (the Decree-Law 441 of 07/08/1991) provides a general outline for the protection and improvement of farmlands. The Pasture Law of 1998 (the Law 4342 of 25/02/1998) has been an important step for the protection of meadows and pastures. The Law on Soil Protection and Land Use (the Law 5403 of 03/07/2005) establishes procedures and requirements for soil protection and improvement by preventing soil erosion and loss of soil features originating from either natural or artificial reasons and for ensuring a planned land usage pursuant to sustainable development principle with the priority given to the environment. In addition, the Regulation on Protection and Usage of Farmlands, which was issued to ensure protection of farmlands and the usage of them as dedicated to purpose, is one of the regulations that contribute to the sustainability of agricultural biological diversity. The Agricultural Law of 2006 (the Law 5488 of 18/04/2006) provides for the conservation and improvement of natural and biological resources as well as conducting researches on the conservation and improvement of genetic resources and ecosystems. The Organic Farming Law (the Law 5262 of 01/12/2004), together with the Regulation on Organic Farming and the Regulation on Good Agricultural Practices, urge environment-friendly agricultural activities. The Regulation on Uprooting, Production and Trading of Natural Bulbs (Official Journal No. 25563 of 24/08/2004), which establishes requirements for uprooting, production, growing, storing, and domestic and foreign trading of seeds, bulbs or other parts of them without giving harm to and destroying perpetuation of their species, contributes to the conservation of the country's flora, including steppe ecosystems.

The Instructions on Field Trials of the Transgenic Cultivated Plants (TGD/TOH-032), which were issued by the Ministry of Agriculture and Rural Affairs on 14 May 1998, made it mandatory to make risk assessments of the transgenic seeds, with respect to agricultural production and the health and safety of humans, animals, plants and to the environmental health and safety, in particular.

A number of studies are being conducted on the conservation of mountain ecosystems, as in other ecosystems. In particular, the National Parks, Natural Parks and Nature Conservation Zones, which are designated under the Law 2873 on National Parks, contain forest and mountain ecosystems.

The Forest Law 6831 specifies forest management requirements, e.g. forest planning, administration and conservation. Conservation forests, gene protection forests and seed stands are designated as provided for in the said Law.

In order to implement the ecosystem approach to forest administration and management, the Forest Management Regulation was redrafted in 2006. The research, conservation, sustainable use, management and monitoring of forest ecosystems are achieved under the scope of this Regulation.

The Law on National Mobilization for Afforestation and Erosion Control (the Law 4122 of 23/07/1995) specifies requirements and procedures concerning the activities of afforestation and erosion control to be undertaken by governmental agencies and real and legal persons in order to enhance the forest area and forest wealth, to restore and improve the balance between soil, water and plants, and to protect environmental values. The Afforestation Regulation specifies requirements concerning the activities of afforestation, erosion control, pasture improvement, tree improvement, seed production, nursery and energy forest establishment,

development and restoration to be undertaken in accordance with the provisions of the Forest Law 6381.

The 2004 National Forestry Programme had the following objectives:

• To address forestry issues from a broad viewpoint within the framework of sustainable development;

• To plan and carry out forestry activities paying the required attention to changes and developments both in the society and in multi-dimensional expectations from forests;

• To build appropriate capacities and mechanisms to enable the preparation, implementation, monitoring, evaluation and development in a participatory manner of development policies and strategies for the forestry sector;

• To promote a positive relationship between forests and people and make it widespread;

• To promote harmony and relations between the forestry and other sectors;

• To raise awareness and strengthen interest, involvement, contribution and support of both the community and the interest groups to achieve a forest management, conservation as well as sustainable development of forests with a view to carry out a balanced and sustainable development;

• To improve and strengthen the living conditions of the actually poor and forest dependent forest villagers living either in or around forests and therefore achieve a multi-sided benefit from forests by way of enhancing a multi-functional and participatory forest resources management; and

• To achieve maximum use of both local and foreign financing sources for the forestry activities.

The principles and measures for the conservation of forest biological diversity as specified by the National Forestry Programme are as follows:

i. To raise awareness and interest and achieve the support of forest administration, society, and interest groups concerning the value of biological diversity and its conservation; To strengthen the forest administration's capacity in this area;

ii. To extend the conservation zone network to represent the biological diversity of the country's forests. To design and implement appropriate participatory planning and management systems for the above areas;

iii. For the conservation of biological diversity in the forests other than those under conservation: To achieve integration with forest resources inventory, planning and evaluation system and applications in an appropriate manner. To give priority on the natural renewal and rehabilitation of forests, and take due care for the conservation of biological diversity during afforestation and other forest development activities;

iv. To promote research studies concerning forests biological diversity. To this end, to enhance dialogue and cooperation among forest administration, universities and research institutions;

v. To give priority on promoting rural development activities in local rural communities having pressure on the natural resources in the conservation zones of special importance.

Within the scope of the National Wetlands Strategy (2003-2008), the following objectives were set and approved by the National Wetlands Committee:

1. To build an inventory of all the wetlands of Turkey, monitor and utilize them;

2. To identify policies and laws, including an impact assessment of wetlands;

3. To integrate the rational use of wetlands with sustainable development;

4. To achieve the restoration and rehabilitation of wetlands;

5. To control the invasive alien species in wetlands and prevent their occurrence in wetlands;

6. To encourage both people and the private sector for active involvement for the wetlands protection;

7. To achieve efficient communication, training and awareness-raising concerning wetlands at the national level;

8. To designate new RAMSAR zones, prepare and follow up RAMSAR zones management plans; and

9. To increase the institutional capacity.

All planning activities which will entail wetlands will be carried out in accordance with the provisions of both the Ramsar Convention and the Regulation on Wetlands Protection. Pursuant to the Regulation, both the conservation of natural structure and ecological character of wetlands and all the land take and water utilization plans must be designed to protect the functions and values of wetlands. Activities entailing wetlands such as drying up and filling, water take, sand borrowing, peat extraction, reed cutting, gathering wild flora and catching wild fauna, afforestation, and wastewater discharge should be carried out in accordance with the provisions of the Regulation.

Furthermore, fishing in inland waters is regulated by the Communiqués issued under the Fisheries Law.

There are various regulations that aim to prevent the pollution of the seas. The Fisheries Law 1380 is the main regulatory tool with regard to the conservation and sustainable use of marine biological diversity. Under the Fisheries Regulation, associated with the Law 1380, two separate circulars are issued biannually to regulate commercial and recreational fishing activities both in seas and inland waters. The fisheries cooperatives, universities and all the relevant institutions and organizations are consulted when drafting the circular. The draft circular is submitted to the Fisheries Advisory Committee for approval. This committee

consists of Ministries, universities, nongovernmental organizations and fisheries unions. In Turkey, fishing regulation comprises four main elements:

1. Regulations concerning the use of fishing gear;

2. Regulations by species and length;

3. Regulations by area and location;

4. Seasonal regulations.

The Decree-law 383 on the Establishment of the Environmental Protection Agency for Special Areas allows the designation of coastal and marine protected areas. Under the cited Decree law, the Environmental Protection Agency for Special Areas (EPASA) is authorized to take all the measures to protect the environmental values and resolve the existing environmental problems of the areas either already designated or to be designated as Special Environmental Conservation Zones, establish the requirements for the conservation and use of those areas, design their development plans, revise their existing plans of any scale and plan decisions and approve such ex officio. The Council of Ministers is the body to designate Special Environmental Conservation Zones in accordance with the cited Decree-law.

CHAPTER IV: CONCLUSIONS: PROGRESS TOWARDS THE 2010 TARGET AND IMPLEMENTATION OF THE STRATEGIC PLAN

4. PROGRESS TOWARDS 2010 AND IMPLEMENTATION OF STRATEGY

4.1. PROTECTION COMPONENTS OF BIODIVERSITY

4.1.1 Promotion of the Conservation of Biological Diversity of Ecosystems, Habitats and Biomes

The conservation of species in their ecosystems is an approach based on the idea that species depend on the natural environment for their survival. In-situ programmes such as National Parks, Nature Conservation Areas, Nature Parks, Wildlife Development Areas, Special Environmental Protection Zones, Natural Sites, Natural Assets and Gene Preservation and Management Areas have been conducted in Turkey since the 1950s. The in-situ conservation sites are given in Table 6 in terms of their status, number and surface area. The proportion of protected areas under various status to the country's total surface area increased from 4 % to about 6 % since 2000. The coverage of protected areas has an increasing trend.

Conservation Programs	Foundation Year	Responsible Institution	Number	Area (acres)
National Parks	1958	MEF	39	878.801,00
Nature Parks	1983	MEF	29	78.868,00
Nature Conservation Areas	1987	MEF	32	63.008,00
Nature Monuments	1988	MEF	105	5.541,60
Wildlife Improvement Areas	1966	MEF	80	1.205.599,00
Wildlife Breeding Stations	1966	MEF	22	4.551
Protection Forests	1950	MEF	57	394,853.00
Gene Protection Forests	1994	MEF	193	27,735,60
Seed Stands	1969	MEF	338	46.086,04
Special Environment Protection Regions	1988	MEF	14	1.206.008,00
Ramsar Areas	1994	MEF	12	200.000,00
Natural Archaeological Protection Areas	1973	Ministry of Tourism and Culture	1003	
Natural Sites	1973	Ministry of Tourism and Culture	2370	
Gene Conservation and Management Areas	1993	MEF/Ministry of Agriculture	Pilot study	Kazdağı and Bolkar Mountains, and Ceylanpınar State Production Farm

Table 6. In Situ Conservation Programs in Turkey

National Parks, Nature Conservation Areas and Natural Monuments

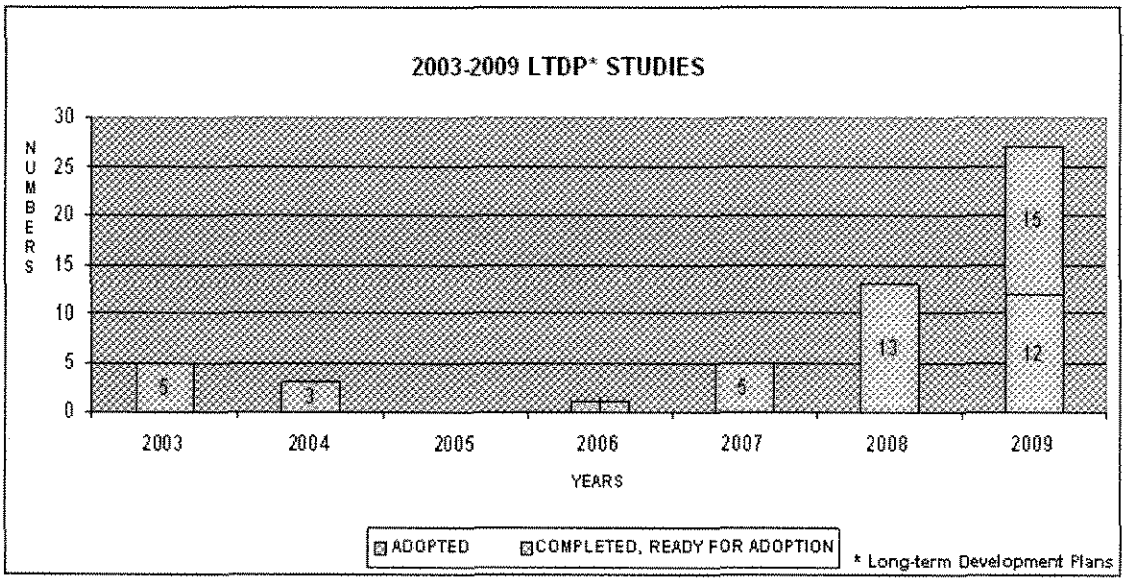
Protected areas are designated with the status of National Park, Nature Conservation Area, Nature Park and Natural Monument under National Parks Law 2873.

The National Park is defined as "a tract of nature with conservation, recreation and tourism areas having rare natural and cultural resource values of national or international significance in scientific and aesthetical terms". There are 39 National Parks in Turkey, 2 of them designated after the last reporting period. They have great importance for the conservation of biological diversity in forest, steppe, wetland and coastal ecosystems.

When the "National Parks Law" entered into force in 1983, the use of the term "tracts of nature" as well as the term "forests" enabled this law to be applied also to non-forest areas that require protection. Since the main objective is the conservation of nature, the term "Nature Conservation Area" was also added to the laws. Nature Conservation Areas are defined as "tracts of nature that contain outstanding examples of rare, endangered or vulnerable ecosystems, species and natural phenomena having importance for science and education, that require absolute conservation and that are allocated exclusively for purposes of science and education".

As of 2009, there were 32 Nature Conservation Areas. Nature Parks are defined as tracts of nature that have a characteristic plant cover and wildlife and that are suitable for public recreation and entertainment within the landscape integrity. In Turkey, there are 29 Nature Parks designated for this purpose, 7 of them designated after the last reporting period.

Natural Monuments are defined as tracts of nature that have characteristics formed by nature or natural phenomena and scientific value and that are protected under the same principles as National Parks. In Turkey, 105 sites are placed under conservation as "Natural Monuments".



Wildlife Improvement Areas and Breeding Stations
In the framework of Terrestrial Hunting Law 4915, areas hosting a natural population of wild animals that face the danger of extinction are placed under protection to conserve these species together with their habitats without spoiling their ecosystem characteristics. In some of these areas, species breeding is also carried out. In Turkey, 80 Wildlife Improvement Areas have been designated. Through the Terrestrial Hunting Law and the decisions of the Central Commission of Hunting, 52 mammal species and 415 bird species have been placed under protection. Activities of conservation are being conducted on a project basis for endangered species such as the Anatolian wild sheep, the black vulture, the bustard, the Caucasian black grouse, the gazelle, the red deer and the bald ibis. Populations of the wild sheep (Ovis orientalis) in Boz Dağ, Konya, the gazelle (Gazella subgutturosa) in Ceylanpınar, Urfa, and the bald ibis (Geronticus eremita) in Birecik, Urfa have been placed under protection and as a consequence of that their extinction has been prevented partly.

Special Environmental Protection Zones
Article 9 of the Environment Law provides that land and water areas of ecological importance on a national or global scale which are vulnerable to environmental pollution and degradation shall be designated as Special Environmental Protection Zones to guarantee that their biological diversity, natural resources and related cultural resources can reach the future generations.

In 1989, the Special Environmental Protection Agency was established by Decree-Law 383 to protect the environmental assets of Special Environmental Protection Zones, to address their current environmental problems and to protect and develop their historical and cultural assets as well as their biological and ecological resources. There are 14 "Special Environmental Protection Zones" currently registered in Turkey. These areas have great importance for the conservation and sustainable use of biological diversity especially as they provide spawning grounds for sea-turtles and habitats for Mediterranean seals.

Natural Sites
The Ministry of Culture initially started activities on the concept of "natural site" included in the "Antiquities Law" adopted in 1973 for the in-situ conservation of our natural assets as well as our cultural assets, and the "Law for the Protection of Cultural and Natural Assets" adopted in 1983 introduced the definition of "natural asset" as well as the definition of "site", with caves, rock shelters, special trees and tree populations included in the definition of natural asset.

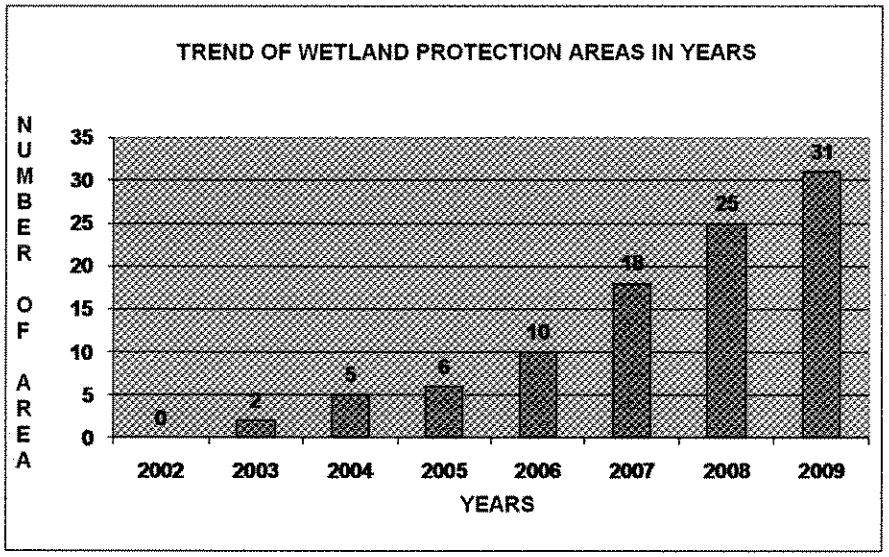
Areas important for biological diversity are included in areas placed under protection as a natural site by the Ministry of Culture and Tourism. As defined by decision 659 of 5.11.1999 adopted by the High Board for the Protection of Cultural and Natural Assets, natural sites are "areas located on or under the ground, or under the water, that require conservation for their rarity or special characteristics and beauties, dating back to geological, pre-historical or historical times".

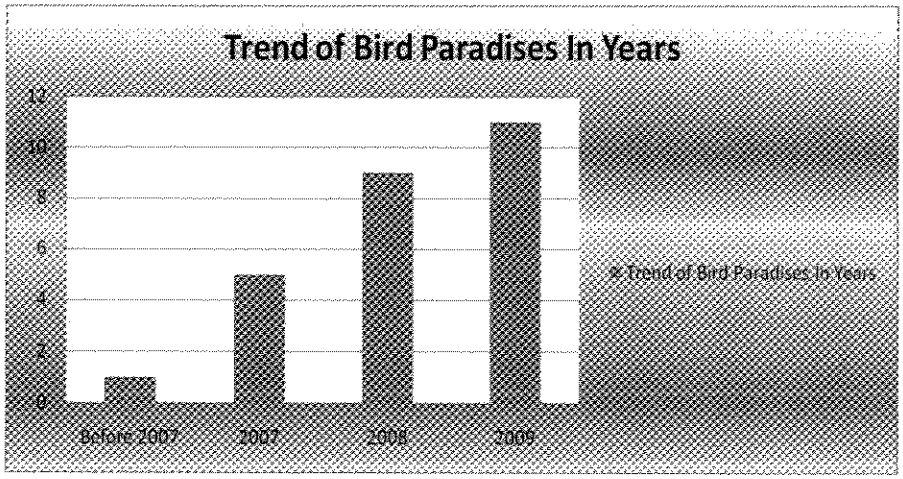
Gene Conservation and Management Areas
The Gene Conservation and Management Areas concept was developed under the project "In-Situ Conservation of Turkey's Plant Genetic Diversity" (1993-1998; GEF-1 Project). Through this project, the necessary institutional and personnel capacity was developed for the in-situ conservation of the gene resources of the wild relatives of agricultural plants and activities were implemented to create Gene Conservation and Management Areas, which are sites

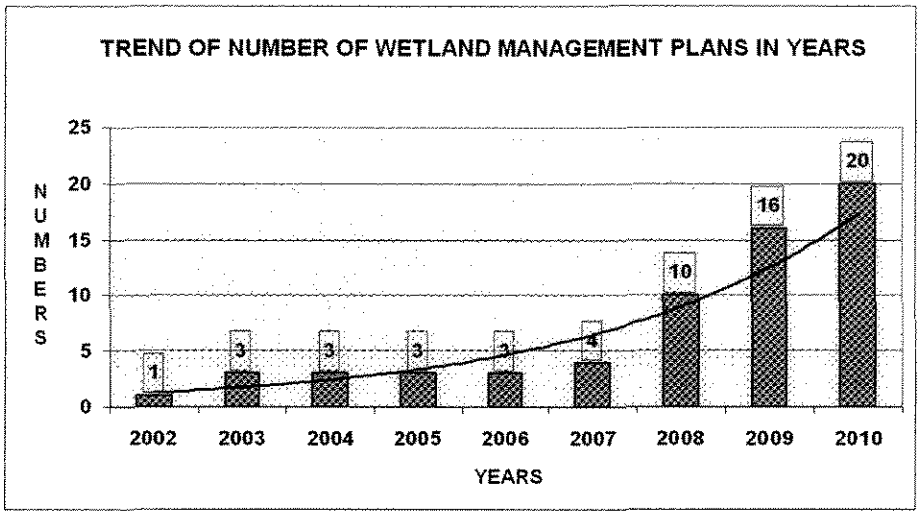
chosen from natural or semi-natural areas for the in-situ conservation of genetic diversity in selected plant species. They are also areas that enable the continuity of evolutionary formations and changes in populations of plant species determined as endemic, endangered and economically important target species".

Ramsar Areas

Turkey acceded to the Ramsar Convention in 1994 and, at the stage of accession, had its 5 wetlands (Lake Manyas, Lake Seyfe, Lake Burdur, Sultan Reedbed and Göksu Delta) recorded in the Convention List. In 1998, the whole of Lake Manyas (Bird) and Lake Burdur, already included in the Convention List in part, and Gediz Delta, Akyatan Lagoon, Lake Uluabat and Kızılırmak Delta were also included in the Convention List. At present, there are 12 wetlands covered by RAMSAR, extending over a total area of 206,830 hectares. Following the assessments made in consideration of international criteria, there are 200 areas determined to be wetlands of international importance. In 13 of these areas, the "Bird Sanctuaries Project" has been started.







Seed Stands and Gene Protection Forests

These are stands in which there are trees with outstanding qualities in terms of required characters under the existing conditions, which are located in a certain geographical region, and which are subject to special management and operation for seed production. Seed Stands are intended to obtain high quality seeds with a known source. 338 Seed Stands in 27 species have been selected in Turkey to date.

Gene Protection Forests are natural stands selected and managed for the in-situ conservation of the genetic diversity of a species. They are intended to protect genetic wealth that exists in nature and to carry it over to future generations. 193 Gene Protection Forests in 28 species have been selected in Turkey to date.

PIMS 1988: Enhancing Coverage and Management Effectiveness of the Subsystem of Forest Protected Areas in Turkey's National System of Protected Areas

"PIMS 1988: Enhancing Coverage and Management Effectiveness of the Subsystem of Forest Protected Areas in Turkey's National System of Protected Areas" Project aims at contributing to the long-term conservation of the most representative range of globally biodiversity by strengthening the national system of protected areas. The project is jointly executed by UNDP Turkey, as GEF Implementing Agency, and MEF as national executing agency. Project partners are General Directorate of Nature Conservation and National Parks, General Directorate of Forestry, General Directorate of Forest Village Relations, General Directorate of Afforestation and Erosion Control and WWF-Turkey. Actions to be undertaken within the context of Protected Areas Work Programme are prioritized.

G2G09/TR/6/2 Establishing the Basis for the Turkish National Forest Inventory Phase I

The main aim of this project is maintaining the resource data and information that are needed in sustainable management of Turkish forests. Moreover, the results of this project will be used in reports of some multilateral environmental agreements such as CBD and will serve to the inventory and monitoring of forest biodiversity in Turkey and will serve to 2010 and post-2010 biodiversity targets and also as a basis for most of the CBD indicators for forest biodiversity to be monitored will be established.

A study for the harmonization of definitions, methods and threshold values of attributions of forest-related national legislation and international conventions is also initiated within the

scope of this project. The forests of Kızılcahamam, a district of Ankara, are chosen as a pilot plot for forest inventory. Then it is planned to extend the study to all Turkish forests within decades.

4.1.2 Promotion of the Conservation of Species Diversity

Conservation Programmes of Mammals, Reptiles and Birds

75 mammal species, 415 bird species, 106 reptiles are under protection of the Ministry of Environment and Forestry. Activities of conservation are being conducted on a project basis for endangered species such as Otis tarda, Urctus arctos and the Ovis gmelinii anatolica, Aegypius monachus, Tetra mlokosiewiczi, Gazella subgutturosa, Cervus elaphus and Geronticus eremite. Populations of the critically endangered species of wild sheep (Ovis gmelinii anatolica) in Boz Dağ, Konya, the gazelle (Gazella subgutturosa) in Ceylanpınar, Urfa, and the bald ibis (Geronticus eremita) in Birecik, Urfa have been placed under successful protection and their extinction has thus been prevented.

Conservation of Aquatic Animal Species

Aquatic species is regulated by the Communiqués issued under the Fisheries Law. Threatened aquatic species are legally under conservation in accordance to the Communiqués. Furthermore, some of the endangered aquatic species are being taken to recovery programmes by MARA. For example, Trabzon Fisheries Research Institute of the MARA has engaged in turbot fry (Psetta maxima) production and released them into the sea in order to enhance natural turbot stocks, which are decreasing rapidly. On the other hand, the Institute has also taken actions to protect the Black Sea brown trout (Salmo trutta labrax) species, which are endemic to the Black Sea and are endangered with the pollution of the rivers. The common otter (Lutra lutra), which is found in many of Turkey's wetlands, is under the threat of extinction and put under conservation in entire Europe. Furthermore a great deal of attention is focused on Monachus monachus and Caretta caretta as well as Chelonia mydas, which are given below in detail.

Species	Scientific name	Species	Scientific name
Beni balığı	Cyprinion macrostamus	**Starfish**	*Asterina pancerii*
Sandbar shark	Carcharhinus plumbeus	**Spider crab**	*Maia squinado*
Black sea salmon	Salmo trutta labrax	**Sturgeon**	Acipencer sp
Long-snouted seahorse	Hippocampus hippocampus	**Screw shell**	-
Sea turtles	Caretta caretta	**Musk octopus**	Elodone moschata
	Chelonia mydas	**Mühreler**	Lamellaridae
	Dermachelys coricea	**Grass Carp**	Ctenopharyngodon idella
	Trionyx triunguis	**Ocean sunfish**	Mola mola
Abalone	Haliotis lamellosa	**Pen shell**	Pinna nobilis
Seagrass	Posidonia oceanica	**Screw shell**	Gourmya yulgata
	Zostera nolti	**Black coral**	Gerardia savaglia
Silver carp	Hypophthalmichtys molitriks	**Triton**	Charonia lampas
Elephant ear sponge	Spongia agaricina	**Commercial Sponges**	Spongia officinalis
Mediterranean monk seal	Monachus monachus		Spongia agaricina
Basking shark	Cetorhimus maximus		Hippospongia communis
Horned octopus	*Elodone cirrhosa*	**Lickers (Strikers)**	Garra rufa
Red coral	*Corallium rubrum*	**Dolphin**	Delphinidae

Table 7. Species of whose catching or collecting are prohibited

Monk Seal (Monachus monachus) conservation initiatives

The monk seal is one of the most endangered species in the world. It is one of the 12 species that was put under conservation by IUCN. Scientists estimate that there are around 300 to 400 monk seals in the world, with around 100 individuals in Turkey's waters.

The monk seal is in the list of the species that need conservation under the Convention for the Protection of Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention) (BARCELONA), the Convention on the Conservation of European Wildlife and Natural Habitats (BERN), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), to which Turkey is a party. The monk seal also enjoys conservation at national level under both the Fisheries Law 1380 and the Environmental Law 2872.

In 1988, the Council of Europe devised an action plan, which covers all monk seal habitats, and that plan was ratified by Turkey. Pursuant to the resolutions at the "International Meeting on the Conservation of Monk Seal, an event organized by the Council of Europe Bern Convention Committee and the MEF in 1991, a National Strategy was built up. The National Strategy envisages a nationwide cooperation. So, the strategy has been devised by the national officials and experts and should be implemented by them. It contains 3 main headings: Research; Conservation and Training.

A national committee has been established involving all the interest groups under the coordination of the MoEF in order to make evaluations on the studies concerning monk seals and ensure coordination. Pilot projects have been implemented in Foça and Bodrum-Yalıkavak within the framework of the implementation of the National Strategy upon the decision of the National Committee on Seals. With those projects, the threats to the monk seal have been identified and the effectiveness of conservation initiatives has been increased. Oil pollution has been observed at a monk seal habitat, which includes an important monk seal cave, too, in Çavuşadası, Bodrum, during those projects and the habitat has been cleaned of oil with the assistance of the Underwater Researches Association and with funding from the MEF. So, the monk seals have regained their habitat. The MEF has produced a documentary film on that cleaning work and the film has been used for training and promotional purposes both at the national and international levels. The National Committee on Seals hold meetings coordinated by the MEF, and so far, 17 areas in the entire country have been designated as important seal areas. Activities (such as training, briefing, regulatory actions by means of circulars on fishing, imposing restrictions on tourism activities, etc.) are currently going on in those areas.

Sea Turtles conservation initiatives

8 sea turtle species live in the world. Among these species, out of 5 are living in the Mediterranean Sea, 2 (Caretta caretta and Chelonia mydas) use Turkey's Mediterranean coasts as a nesting area. Based on the IUCN criteria, while Caretta caretta is in "Vulnerable" status, the Chelonia mydas is at the "Endangered" status. The endangered sea turtles have been put under conservation under the international conventions, to which Turkey is a party and by means of initiatives started at the national level.

First of those initiatives started 1988 when the Köyceğiz Dalyan, a part of the Gökova Gulf and a part of the Göcek Gulf, all these include the nesting areas of sea turtles, were given a Special Environmental Conservation Zone status by a resolution of the Council of Ministers. In 1989 a committee was set up for the conservation of sea turtles, and conservation measures

were taken based on the academic publications. The setting up of a "Monitoring and Evaluation Committee on Sea Turtles followed this in 1990 in order to monitor the implementation of those measures. The Committee held meetings and conducted on site investigations. As a result, they identified the threats to the nesting areas of sea turtles and further improved the conservation measures.

At the end of the studies conducted at national level, 19 sand-dunes on the Mediterranean coasts have been identified as important nesting areas. Of those sand-dunes, Ekincik Dalyanı, Dalaman, Fethiye, Patara, Belek, Göksu Delta sand-dunes have been given a Special Environmental Conservation Zone status by a resolution of the Council of Ministers. The Yumurtalık sand-dune has been given Nature Conservation Zone and Akyatan sand-dune has been given Wildlife Conservation Zone statuses. Of other sand-dunes, Demirtaş, Gazipaşa, Anamur, Alata, Kazanlı, Tekirova ve Kale 1st Degree Natural Site, Kumluca, Samandağ and Kızılot sand-dunes have been put under conservation. The Conservation Zones of Sea Turtles have been divided into four parts as Primary Conservation Zone, Secondary Conservation Zone, Buffer Zone and Impact Area, with conservation and utilization requirements established for each of the above.

Conservation of Plant Species

"The red data book of Turkish plants (Pteridophyta and Spermatophyta)" which was originally published in 1989 has been revised in 2000. IUCN Category versus endemism table given in the book is as follows:

	EX	EW	CR	EN	VU	LR (lc)	LR (ld)	LR (nt)	DD	NE
ENDEMIC	12	-	171	774	688	769	470	347	270	3
NOT ENDEMIC	1	-	10	69	769	-	-	-	244	3
TOTAL	13	-	181	843	1457	769	470	347	514	6

Table 8. IUCN Category vs endemism

This red data book is used as a reference in environmental impact assessments.

Also the number of tree species under in-situ conservation in "Gene Protection Forests" increased from 10 to 27, in 2008.

All bulbous plants are under conservation by "The Regulation on the Collection, Production and Exportation of Natural Flower Bulbs" which sets forth principles concerning the collection from the wild, production, growing and storing of and domestic and foreign trade in seeds, bulbs or other parts of natural bulbous flowers without destroying and depleting their population.

It is estimated that %33 of the most important areas for plant diversity has appropriate conservation status. Since the endemism ratio is very high in these areas, it is also estimated that at least %50 of endangered plant species are being conserved *in-situ* and approximately %50 of endangered species are being conserved *ex-situ*.

4.1.3 Promotion of the Conservation of Genetic Diversity

Gene Conservation and Management Areas are developed under the project "*In-Situ* Conservation of Turkey's Plant Genetic Diversity" (1993-1998; GEF-1 Project). Through this project, the necessary institutional and personnel capacity was developed for the in-situ conservation of gene resources of the wild relatives of agricultural plants and activities were implemented to create Gene Conservation and Management Areas, which are sites chosen from natural or semi-natural areas for the in-situ conservation of genetic diversity in selected plant species. They are also areas that enable the continuity of evolutionary formations and changes in populations of plant species determined as endemic, endangered and economically important target species".

Seed Stands and Gene Protection Forests are stands in which there are trees with outstanding qualities in terms of required characters under the existing conditions, which are located in a certain geographical region, and which are subject to special management and operation for seed production. Seed Stands are intended to obtain high quality seeds with a known source. 338 Seed Stands in 27 species have been selected in Turkey to date.

Gene Protection Forests are natural stands selected and managed for the in-situ conservation of the genetic diversity of a species. They are intended to protect genetic wealth that exists in nature and to carry it over to future generations. 193 Gene Protection Forests in 28 species have been selected in Turkey to date.

Ex-situ conservation activities in Turkey have started in 1964 at the Aegean Institute of Agricultural Research, affiliated to the MARA, and seed specimens belonging to Turkey's plant genetic resources began to be preserved for the long term (basic collections) and for the short and medium term (active collections) at the national seeds gene bank established in 1972 within the same institute. The basic collections are preserved at -18/-20 °C for the long term and the active collections at 0°C for the medium term, in two sets. The national collection includes land races, wild and herbaceous relatives (in the collections of both seeds and living plants), other wild plant species of economic importance (such as medical, aromatic and decorative plants) and endemic plant species. Certain species peculiar to Southwest Asia and a small part of wheat and barley varieties in the world are also included in the collection. The seeds of endemic plants collected under the "Turkish Endemic Plants Project" with SPO support between 1992 and 1997 are also preserved in the National Gene Bank. Today, some 50,000 materials distributed over about 600 genera are kept in the National Gene Bank. Of those materials, about 10,000 belong to 2,400 wild species. This organization continues its activities concerning the classification, documentation and conservation of seeds, leguminous plants, fodder plants, vegetables, fruits, decorative plants, and medical and aromatic plants. The security backups of the basic collection are preserved at the Field Crops Central Research Institute.

16 of the research institutes within the MARA have field genetic reserves where material with vegetative propagation is preserved in field conditions. The field genetic reserves, distributed in various provinces such as Yalova, İzmir, Tekirdağ, Gaziantep, Malatya and Erzincan, include mainly collections of fruit species. Outside the MARA, the Seed Bank of Osman Tosun within the Field Plants Department, the Faculty of Agriculture, the University of Ankara, has been active since 1936 and has medium term preservation facilities. This organization keeps about 11,000 seed specimens. Atatürk and Çukurova Universities and other universities with a Faculty of Agriculture are also engaged in similar activities. Among

these activities contributing to ex-situ conservation, one may count the Botanical Garden of the Aegean University, the Botanical Garden of the Istanbul University and the Atatürk Arboretum of the Istanbul University. In addition, other botanical gardens and arboretums have been established through private initiatives in recent years (Nezahat Gökyiğit Botanical Garden, Karaca Arboretum, etc.).

Ex-situ conservation efforts for forest trees (seed gardens, origin trials, progeny trials) are made by organizations affiliated to the Ministry of Environment and Forestry, especially by the Directorate of Forest Trees and Seeds Improvement and Research. Turkey is a member of the EUFORGEN and the agreement among member countries for the establishment of a core collection is at the stage of preparation. A total of 169 seed gardens in 8 species, a total of 35 seed plantations in 19 species and a total of 13 clone parks in 5 species have been established to date.

For the purpose of protecting and developing Turkey's plant genetic resources, **"The Regulation Concerning the Collection, Protection and Utilization of Plant Genetic Resources"** sets forth principles concerning their survey, their collection and the protection, conservation, production, replacement, characterization, assessment, documentation and exchange of collected material. The National Seed Bank and Herbarium has been established under this Regulation, which also covers the issue of permits for research on plant genetic resources.

"The Regulation Concerning the Protection of Animal Genetic Resources" sets forth procedures and principles concerning the determination of the genotypic and phenotypic characteristics of Turkey's animal genetic resources, their breeding for conservation, and the recording and conservation of those characteristics.

4.2 PROMOTION OF SUSTAINABLE USE AND CONSUMPTION

The laws and regulations that may contribute to the sustainable use of biological diversity and that include provisions concerning the management of resource use are as follows:

1. The Forest Law (6831-31.08.1956): Sets forth principles concerning forest management such as the planning, operation and conservation of forests.

2. The Pastures Law (4342-25.02.1998) and the Pastures Regulation: They were put into force with the aim of ensuring the use of pastures, summer quarters, winter quarters, grazing areas and meadows in accordance with rules to be set, carrying out their maintenance and improvement, increasing and sustaining their productivity, continuously supervising their use, and changing their purpose of use when required.

3. The Coastal Law (3621/3830-04.04.1990): Sets forth principles for the conservation of sea, natural and artificial lake and river coasts and of the coastal strips that are under their influence and an extension of them, considering their cultural and natural characteristics, and for their use for public benefit.

4. The Agriculture Law (5488-18.04.2006): Includes procedures and principles for determining the goals, scope and subjects of agricultural policies, defining the goals and principles of agricultural support policies and the basic support programmes, determining the market regulations, financing and administrative structures related to the implementation of

these programmes and making the legislative and administrative arrangements related to the priority research and development programmes to be implemented in the agricultural sector. It includes the conservation and development of natural and biological resources among the goals of agricultural policies and charges the MARA with the duty of conducting research for the conservation and development of biological diversity, genetic resources and ecosystems.

5. The Soil Protection and Land Use Law (5403-03.07.2005): Sets forth procedures and principles to ensure the conservation and development of soil by preventing its loss and degradation through natural or artificial ways and the planned use of land in accordance with the principle of sustainable development giving priority to the environment.

6. The Law on National Mobilization for Afforestation and Erosion Control (4122-23.07.1995) and the Regulation on Afforestation: Specify principles and procedures concerning the activities of afforestation and erosion control to be undertaken by governmental agencies and natural and legal persons in order to enhance the forest area and forest wealth, to restore and improve the balance between soil, water and plants, and to protect environmental values. The Regulation sets forth principles concerning the activities of afforestation, erosion control, pasture improvement, tree improvement, seed production, nursery and energy forest establishment, development and restoration to be undertaken in accordance with the provisions of the Forest Law 6381.

7. The Organic Farming Law (5262-01.12.2004) and Regulation: They were put into force with the aims of protecting the ecological balance, conducting activities of organic farming, and regulating, developing and spreading organic agricultural production and marketing.

8. The Regulation on Good Agricultural Practices: It was put into force with the aims of conducting agricultural production not harmful to the environment and to human and animal health, protecting natural resources and ensuring traceability and sustainability in agriculture and food safety.

9. The Regulation Concerning the Protection and Use of Agricultural Land: This Regulation sets forth procedures and principles related to ensuring the conservation of agricultural land and its use in accordance with its intended purpose and the exceptional cases in which such land may be used for non-agricultural purposes. Agricultural Control and Agricultural Quarantine Law 6968 of 15.05.1957 and Animal Health and Surveillance Law 3285 of 08.05.1986 rank first among the legislation to ensure the border control, for both health and conservation purposes, of living species that will enter or leave Turkey. In addition, Anti-Smuggling Law 5607 of 19.07.2003, in force since 1932 and updated in 2003 and Customs Law 4458 of 27.10.1999 regulate border controls.

Biological Diversity and Natural Resource Management Project

The project, supported by the World Bank-Global Environmental Fund, which became effective in 2000, was completed in December 2007. It is the most comprehensive Biological diversity Project conducted by Turkey so far with a large-scale GEF contribution. This project aims at efficient, intersectoral and participatory planning and sustainable management of nature conservation and natural resources in the pilot sites of İğneada, Camili, Köprülü Canyon and Sultansazlığı, representing the three important phytogeographical regions, and in 9 replication sites.

Through protected areas management plans prepared with the participatory and ecosystem based approach, regarded as an alternative to the conventional planning approach, the project gives attention to meeting the needs of the people living in or around the protected areas as well as the requirements of nature conservation and natural resource management. The national database called "Noah's Ark" and a Biological Diversity Monitoring Unit were created to monitor the current state and the progress of biological diversity in Turkey and to use the data concerning biological diversity more effectively in conservation activities. In this context, gaps analysis work has also been started for the protected areas. Again, the legal and institutional structure required for sustainable nature conservation and resource management has been reviewed and the "Draft Law for Nature Conservation" was prepared. The Forest Management Regulation has been redrafted to ensure more effective conservation of biological diversity in exploited forests.

To ensure the participation of stakeholder groups in conservation activities in the 4 pilot areas determined, grant support has been provided in the amount of 1 million USD for about 150 small-scale projects which were considered biological diversity conservation-friendly.

Raising public awareness and training of relevant persons on biological diversity conservation and natural resource management have also been implemented under the project. The Camili Biosphere Reserve, the first of its kind in Turkey, has been established under this project. This project is completed in 2007. The outputs of the project, the experience gained and the training provided under the project are being used in planning of Turkey's future conservation activities in a more effective and sustainable manner.

4.3 ADDRESSING THREATS TO BIODIVERSITY

4.3.1. Reduction of Pressure from Habitat Loss, Land Use Change and Degradation and Unsustainable Water Use

The National Parks and Conservation Zones Management, Biological Diversity Conservation and Rural Development Project, which was implemented in the Küre Mountains National Park in Bartın and Kastamonu, the Biological Diversity and Natural Resources Conservation and Sustainable Development in the Yıldız Mountains Project, and the Sustainable Forest Utilization and Conservation in the Kaçkar Mountains Project are the three examples showing the practices which were implemented or are ongoing for the conservation of the mountain ecosystems and their sustainable management.

Anatolia Water Basins Rehabilitation Project
The Project Loan Agreement was signed on 4 October 2004 and it is planned that the project will be completed in 2011. The aims of the project are to achieve sustainable resource management and participatory planning in the Central Anatolia and Black Sea regions, to reduce pressure on natural resources, to adopt environment-friendly agricultural and silvicultural practices, to enhance institutional capacity, to raise public awareness and to develop water and food management policies in the process of alignment with the EU. In connection with the rehabilitation and income-raising activities, the project aims at also identifying the Pollution of Agricultural Origin in the Kızılırmak and Yeşilırmak basins and eliminating or reducing the negative impacts of such pollution, with support from GEF.

In the 28 micro basins determined under the project, a series of actions to develop natural resources will be implemented in cultivated areas, pastures and forest land, including the development of pasture management, the rehabilitation of pasture and forest areas, the enrichment of these areas in plant cover, the increased production of fodder crops, the reduction of agricultural areas left fallow, the adoption of environment-friendly farming techniques, the implementation of measures to increase animal feed and wood production and to promote soil conservation and agricultural techniques to protect humidity.

4.3.2 Controlling Threats from Invasive Alien Species

The Agricultural Combat and Agricultural Quarantine Law 6968 of 15/05/1957 and Animal Health and Surveillance Law 3285 of 08/05/1986 are the two important laws providing for border controls for both health control and protection of species entering/exiting Turkey. International quarantine and health certificate practices for biological material transfer are legal requirements and constitute one of the control mechanisms. Any gathering and transfer of species are also subject to the MARA regulations.

A permit from the MARA is required for selling, transport, catching in harvesting areas, gathering, handling of plants, releasing into water of fish, their broodstocks, fry, larvae, juveniles and spawners, as well as aquatic plants in order to ensure the nationwide control of fisheries production in accordance with the Communiques on Commercial Marine and Inland waters Capture Fisheries Production, which are renewed every year under both the Fisheries Law and Fisheries Regulation. The Communiques on Marine and Inland waters Recreational (Sport) Fishing classify both ecologically-unfavourable inland waters fish and potential ecologically unfavourable inland waters fish and prohibits release of the fish of this class into rivers and lakes in an uncontrolled manner and without permission, use them as a live bait and the transportation of them from one place to another for the same purpose.

With a Draft Bill on the Amendment of the Fisheries Law, it is expected that the release of any alien species into water resources will be prohibited, unless this action is taken with the permission of the MARA.

The majority of invasive alien species of Turkey are marine species, most of which are introduced via marine transport. The Undersecretariat of Maritime Affairs continues its efforts to prevent the carrying of alien species in ballast waters. Therefore the following projects are executed to challenge this issue.

Control and Management of Harmful Aquatic Organisms which are carried in Ballast Waters Project

The carrying of harmful aquatic organisms in ballast waters is recognized as one of the biggest problems of the global ship industry. The Control and Management of Harmful Aquatic Organisms which are carried in Balast Waters Project has been initiated by the Undersecretariat of Maritime Affairs with the purposes of identifying the current situation in Turkey regarding ballast waters and developing Ballast Water Management Systems that can be applied at Turkey's seas. Under the project, the prediction values regarding ballast carrying situation in Turkey and its impacts on organisms and the future ballast carrying and its impacts on organisms have been determined.

The target invasive species which are carried to Turkey's seas by the existing marine traffic and occur in the seas where ballast waters are carried as the future tendencies show and which

are identified to be harmful and may be invasive when carried to Turkey's seas have been selected for each sea and listed and their impacts have been demonstrated. Based on the project outputs, 263 alien species have been identified in Turkey's seas, out of which 176 have come from the Suez Canal, 6 from the Gibraltar Strait, 3 from aquaculture and 66 have been carried in ballast waters. Of those organisms carried in ballast waters, 19 are considered as harmful aquatic organisms. Initiatives on devising a national management plan are currently underway under the project.

Establishment of Emergency Intervention Centers and Identification of the Current Situation at Turkey's Seas Project

Being one of the narrowest and most winding water routes in the world and serving as a significant corridor between the Mediterranean Sea and the Black Sea, the Turkish Straits are at constant risk of accidents and pollution with around 55,000 vessels using the straits every year. Nearly 18% of those vessels are tankers carrying hazardous substances. The Undersecretariat of Maritime Affairs has initiated a project, i.e. the Establishment of Emergency Intervention Centre and the Identification of Current Situation at Turkey's Seas Project, to prevent the pollution of seas, protect the marine environment and intervene effectively with emergencies, as well as for the purposes of fulfilling our obligations arising out of the international and regional conventions, to which Turkey is a party, within the framework of the risks caused by the hazardous substance traffic on Turkey's waters. Under the project, actions are taken to identify coastal and marine areas that are vulnerable to pollution, risk level, marine and coastal areas that need conservation, their natural resources, shore facilities, possible pollution causes and characteristics, the possible movement of pollution at the intervention stage, together with possible constant and variable factors that may have impact on this, and similar issues for the establishment and operation of emergency intervention centres to fight against any possible oil or other hazardous substance spills onto the sea in an accident and other events. To this end, 1/25,000-scale maps of all the coasts of Turkey have been prepared. These maps also provide economic, socio-economic and environmental information. The activities include field studies, as well, e.g. the identification of eelgrasses. The project is planned to be completed within the year 2009.

Project on Researching Caulerpa Species in Mediterranean

The project which was started to determine the present state of alien invasive Caulerpa species at Turkish coasts endangering the biodiversity of seas and biodiversity properties to define the entrance ways of these plants to take the necessary precautionary measures to prepare a plan for the actions considered in this respect has reached its propose in a general sense. The Action Plan which determines the institutional, legislative and administrative arrangements to mitigate these plants was developed. The project has been concluded in 2001.

4.3.3 Address Challenges to Biodiversity from Climate Change and Pollution

Project on enhancing the capacity of Turkey to adapt climate change

The official summary of the project as it is published on the project website (http://sdnhq.undp.org/opas/en/proposals/suitable/176) is "This joint program addresses the priority area of "Enhancing Capacity to Adapt to Climate Change". Turkey is highly vulnerable to climate change. As part of the southern belt of Mediterranean Europe, Turkey is already facing an observed warming trend in temperatures and a decreasing trend in precipitation. The core objective of developing national capacities to manage climate change risks would be achieved through mainstreaming climate change issues into (1) national development framework; (2) local pilot actions; and (3) the UN country programmatic

framework. This joint program was developed by the UN Country Team with clear roles and responsibilities for each participating UN entity."

Community Based Adaptation to Climate Change Grants Programme in the Seyhan River Basin

A Grants Programme is being initiated in the Seyhan River Basin in the context of the United Nations Joint Programme on Enhancing the Capacity of Turkey to Adapt to Climate Change. Projects developed on climate change adaptation in the Seyhan River Basin with a community based adaptation approach will be supported through the Grants Programme. The UN Joint Programme will guide climate change adaptation approaches by providing climate change adaptation principles in the areas of agricultural practices, water management, food security, disaster risk management induced by climate change, development of coastal areas, natural resources management and data and information management.

The objective of the Grants Programme is to enhance the capacity of communities and institutions in the Seyhan River Basin through piloting innovative adaptation actions as well as by supporting changes in institutional and managerial outlook in order to decrease the adverse effects and increase the benefits of climate change and thus securing the achievement of the Millennium Development Goals.

4.4. MAINTANANCE OF GOODS AND SERVICES FROM BIODIVERSITY TO SUPPORT HUMAN WELL-BEING & PROTECTION OF TRADITIONAL KNOWLEDGE, INNOVATION AND PRACTICES

The following strategic objectives are established in the National Rural Development Strategy and Plan of The Republic of Turkey.

- ✓ Economic Development and Increasing Job Opportunities
- ✓ Attaining a competitive structure for agriculture and food sectors
- ✓ Diversification of the Rural Economy
- ✓ Strengthening Human Resources, Organization Level and Local Development Capacity
- ✓ Strengthening Education and Health Services
- ✓ Combating Poverty and Improving Employability of Disadvantaged Groups
- ✓ Improving Rural Physical Infrastructure Services and Life Quality
- ✓ Improvement of Rural Infrastructure
- ✓ Improvement and Protection of Rural Settlements
- ✓ Protection and Improvement of Rural Environment
- ✓ Improvement of Environmental-Friendly Agricultural Practices
- ✓ Protecting Forest Ecosystems and Sustainable Utilization of Forest Resources
- ✓ The Management and Improvement of Protected Areas

In the context of the project on mainstreaming biodiversity conservation and sustainable use for improved human nutrition and well-being, the database of traditional knowledge in Turkey will be established.

4.5. THE FAIR AND EQUITABLE SHARING OF BENEFITS ARISING FROM THE USE OF GENETIC RESOURCES

The current regulations on the access to genetic resources and benefit-sharing in Turkey have been stated in section 1.4.5.1 of this report. Turkey has very restricted access to other countries' genetic resources in agriculture and forestry sectors and its access is based on agreements on material transfer, therefore Turkey shares benefit with the resource-provider countries. However, the measures taken at the national level to control access by foreigners to genetic resources in Turkey and ensure benefit sharing in this regard is not sufficient, since the sharing of benefits from genetic resources is directly related with taking measures to ensure the conformance of access countries to the Convention. As a result, lack of an effective international mechanism, involving sanctions against biological material smuggling is the major obstacle to achieve the related 2010 target.

Despite the lack of international regime, Turkey exerted efforts to ensure compliance of foreigners to the provisions of CBD in terms of access and benefit sharing obligations of the Parties. In this regard, awareness rising activities were executed by MEF, NGOs and other related institutions. The cases of catching smugglers of genetic material have an increasing trend.

ANNEX I
INSTITUTIONAL STRUCTURE AND LEGISLATION RELATED WITH BIODIVERSITY

It is the responsibility of the MEF and its affiliated organizations to formulate the policies concerning the conservation and sustainable use of the environment and biological diversity, to designate and manage protected areas under various statuses, to develop and implement plans and programmes, to carry out activities in this scope and to ensure coordination among different institutions. These duties and responsibilities are performed through the central and provincial units of the Ministry and its affiliated organizations. The main service units of the central organization of the MEF are the following:

1- General Directorate of Nature Conservation and National Parks
2- General Directorate of Environmental Management
3- General Directorate of Environmental Impact Assessment and Planning
4- General Directorate of Afforestation and Erosion Control
5- General Directorate of Forest-Village Relations
6- Department of Research and Development
7- Department of Foreign and EU Affairs
8- Department of Training and Publication

The affiliated organizations of the MEF are the Special Environmental Protection Agency, the General Directorate of Forestry, the General Directorate of the State Meteorological Service, and the General Directorate of State Hydraulic Works. The provincial organization of the MEF consists of the Provincial Directorates of Environment and Forestry and the regional directorates of the affiliated organizations.

The Ministry's unit with primary authority and responsibility for the conservation and sustainable use of biological diversity is the General Directorate of Nature Conservation and National Parks, which is also the CBD focal point. The General Directorate of Nature Conservation and National Parks is the principal unit responsible for the management of protected areas designated under the National Parks Law, for the conservation of wildlife and for the regulation and supervision of terrestrial hunting. Hunting is regulated in accordance with decisions of the Central Hunting Commission, headed by the MEF and composed of the representatives of relevant governmental agencies, voluntary organizations, specialists and hunting associations. The Special Environmental Protection Agency and the General Directorate of Forestry are the affiliated organizations responsible, respectively, for the designation, conservation and management of Special Environmental Protection Areas and for the conservation, development, operation and management of forests.

The Ministry of Agriculture and Rural Affairs is another important institution with authority and responsibility in the conservation and sustainable use of biological diversity. The MARA has assumed the responsibility for coordination and use concerning all agricultural resources and water products. The activities such as the conservation and management of pastures, the investigation, development and conservation of the wild relatives of cultivated plants and domesticated animals and of local varieties and races, the conservation of water products and management of water products hunting, and to take agricultural quarantine measures, conducted by the MARA in the scope of its duty under its founding law to protect and develop soil, water, plant and animal wealth and similar natural resources serve the conservation and sustainable use of biological diversity.

Those duties and responsibilities of the Ministry of Agriculture and Rural Affairs concerning biological diversity are performed by its central and provincial organizations through the

General Directorate of Agricultural Research, the General Directorate of Protection and Control and the General Directorate of Agricultural Production and Development, which are among its main service units. In addition to agricultural research and development activities, the General Directorate of Agricultural Research also functions as the national focal point concerning biosafety, access to genetic resources and benefit-sharing under the CBD.

The Ministry of Culture and Tourism is another institution with authority in the designation of protected areas. With the aim of preserving Turkey's natural and cultural assets and carrying them over to future generations, the natural sites determined by the General Directorate of Cultural Assets and Museums under the Law for the Protection of Cultural and Natural Assets are registered and placed under protection by the Regional Protection Boards. Resolutions concerning the conservation and restoration of cultural and natural assets requiring conservation are adopted by the High Board for the Protection of Cultural and Natural Assets, headed by the Undersecretary of Culture and Tourism and composed of high-level officials from relevant Ministries.

In addition to the agencies mentioned above, the other main institutions involved in the conservation and sustainable use of biological diversity as a result of their duties and authorities in the management of non-living natural resources are the following:

- Ministry of the Interior
- Turkish Coast Guard Command
- Undersecretariat of Maritime Affairs
- Ministry of Public Works and Housing
- Ministry of Energy and Natural Resources

The Scientific and Technological Research Council of Turkey and universities as well as the research institutes of the MEF and the MARA take part in the investigation of biological diversity.

In Turkey, there are many national and local non-governmental organizations contributing on a voluntary basis to the conservation and sustainable use of biological diversity, including public awareness- raising in particular.

As the competent agency in the preparation of national plans and programmes, the Undersecretariat of the State Planning Organization ensures the formation of environmental policies and planning of investments together with other sectors in the framework of development plans. The investment programmes prepared by the SPO constitute the basic financial mechanism for the activities towards the conservation and sustainable use of biological diversity. Fines and the incomes obtained from the pricing of environmental services as well as the respective shares allocated to the Ministries out of the general budget provide financial resources for conservation activities through revolving funds.

Institutional Structure and Capacity on Agriculture and Steppe Ecosystems

The Ministry of Agriculture and Rural Affairs is the primary authority with responsibility for farmlands and steppe ecosystems. Being the main affiliates of the Ministry of Agriculture and Rural Affairs, the Directorate General of Agricultural Researches, Directorate General of Agricultural Production and Development, and Directorate General of Protection and Control have the institutional capacity which contributes to research, development and conservation of agricultural biological diversity. There are also 24 Agricultural Enterprises Directorates

operating under the Directorate General of Agricultural Enterprises, an associated body of the Ministry. These are enterprises engaged in crops and stock farming, in particular the farming of seeds and breeding animals. 64 research institutes operate under the Directorate General of Agricultural Researches. The main institutes responsible for the conservation and management of genetic diversity (generally ex-situ conservation) are the Aegean Agricultural Research Institute (ETAE) and the Research Institute for Field Crops. The ETAE cooperates and coordinates with the Field Crops Research Institute and other basin and thematic research institutes, in particular, the studies concerning the conservation of plants genetic diversity. The National Gene Bank and herbarium are established within the ETAE. The Geographical Information System of the Field Crops Research Institute provides effective management of natural resources. In addition, with around 30 thousand insect species, the Plant Conservation Museum of the Research Institute for Agricultural Combat in Ankara is engaged with the work of demonstrating Turkey's species diversity. Both the Directorate General of Agricultural Production and Development and the Directorate General of Protection and Control contribute to the conservation and sustainable use of agricultural biological diversity and steppe areas. This is achieved by the protection and rehabilitation of pastures and meadows and by the reduction of agricultural pollution and support of environment-friendly agricultural activities.

Institutional Structure and Capacity on Forest and Mountain Ecosystems

The Directorate General of Forests (DG Forests), an affiliate of the Ministry of Environment and Forestry (MEF), has the responsibility and duty for the conservation, management and administration of forests. DG Forests has central and local administrations. MEF has also 8 regional and 3 specialized research institutes which assume research and development tasks concerning forests. The Directorate General of Natural Conservation and National Parks assumes the responsibility for conservation and management of the forests under conservation by way of the National Parks Law. The Directorate General of Forest and Villages Relations undertakes to develop forest villages and arrange forest and village relations, and the Directorate General of Afforestation and Erosion Control assumes the rehabilitation of the degraded forest ecosystems.

The mountain ecosystems have different ecosystems such as wetlands, steppes, meadows and pastures and forests, and therefore the institutional responsibility for them is segregated. For example, while the DG Forests assume the management of the in-forest meadows, the management of other meadows is assumed by the Ministry of Agriculture and Rural Affairs (MARA). As a result, many agencies having either a direct or an indirect authority with regard to biological diversity exercise authority on the mountain ecosystems, as well.

Institutional Structure and Capacity on Inland Ecosystems

Basically, the Ministry of Environment and Forestry is responsible for the conservation of inland waters ecosystems. The identification, conservation and management of wetlands are conducted by a division of the DG of Natural Conservation and National Parks. A National Wetlands Committee has been set up with functions of holding discussions on the issues related with wetlands and decisions on them, of the approval of conservation zones and management plans, follow up of practices and of the establishment of necessary national and international cooperation and coordination. The Committee consists of 10 members. These include the Undersecretary and/or the Assistant Undersecretary, who is the chairman of the Committee, and the Director General of Protection and Control of the MARA, the Director General of State Hydraulic Works, the Director General of Cultural Assets and Museums of the Ministry of Culture and Tourism, the Head of the Special Environmental Conservation Institution, as well as two members from the biology and agriculture departments of

universities, these two should not be from the same discipline, and lastly two members from non-governmental organizations with activities involving wetlands.

The Directorate General of State Hydraulic Works (SHW) is responsible for planning, management, development and administration of all the water resources of Turkey.

The Ministry of Agriculture and Rural Affairs regulates capture fisheries and four research institutes of the Ministry have research and development functions concerning fisheries.

Institutional Structure and Capacity on Coastal and Marine Ecosystems

Being a body that makes regulations and does research related to fisheries, the Ministry of Agriculture and Rural Affairs (MARA) is conducting the other main governmental agency having duties and responsibilities regarding coastal and marine ecosystems next to the Ministry of Environment and Forestry (MEF). The Directorate General of Protection and Control of MARA regulates capture fisheries production. 4 fisheries research institutes of MARA conduct fisheries researches, take restocking actions for the species that are under the threat of extinction as well. The Coast Guard Command plays an active role in the conservation of Turkey's seas, through prevention of any smuggling by the sea, the control of fishing and making preventive controls on the pollution of the seas. Building its capacity day by day, the Coast Guard Command has been successful at controlling arrangements for the sustainable use of Turkey's living marine resources, the monitoring of fishing fleet, preventing the pollution of the seas and taking actions for the conservation of marine ecosystems. With regard to capacity building and enhancing the effectiveness of controls, under the Legal and Institutional Alignment of the Fisheries Sector to the EU Acquis Project, the Vessel Monitoring System, which allows a satellite-based monitoring of fishing vessels, has been installed and is at trial stage. The attempts to expand and improve the legal basis of the VMS, which is recognized as a method that considerably enhances capacities of countries in the controlling of fishery regulations including fishery zones, fishing time, protected areas and in the monitoring of fishing vessels are underway. The Undersecretariat of Maritime Affairs is the competent authority for all the maritime affairs. The Ministry of Public Works and Settlement has power in planning coastal areas as per the Coastal Law and the relevant regulations. More than 10 fisheries departments and 4 institutes of maritime sciences from various universities provide academic and technical research infrastructure and capacity.

Turkish Environmental Law

The Environmental Law, dated 09.08.1983 and numbered 2872, aiming at the protection of the environment and all species in accordance with the principles of sustainable environment and sustainable development, determines and provides for the basic principles related to protecting and improving the environment and preventing its pollution. Law 5491 of 26.04.2006 Amending the Environment Law, states the importance of protecting biological diversity in Article 6 and introduces penal sanctions against damage to the environment, including the destruction of biological diversity, when detected through inspection and audits. The regulations issued on the basis of the Environment Law specify rules on the prevention of pollution and on environmental impact assessment.

The laws and regulations for species and site protection in Turkey are as follows:

1. Law on National Parks (2873 - 09.08.1983): Provides for the designation of national parks, nature parks, natural monuments and nature conservation sites with national and international value and for their conservation, development and management without spoiling their

characteristics. Technical details for the implementation of the Law have been introduced by the National Parks Regulation.

2. Law for the Protection of Cultural and Natural Assets (2863 - 23.07.1983): Sets forth definitions related to movable and immovable cultural and natural assets requiring conservation and regulates the actions and activities to be carried out. Natural sites are designated according to this Law.

3. Decree-Law Establishing the Special Environmental Protection Agency (383 -19.10.1989): This Decree-Law establishes the Special Environmental Protection Agency to take all measures for protecting the environmental assets of areas designated or to be designated as "Special Environmental Protection (SEP) Zone" and solving their existing environmental problems, to determine the principles of conservation and use for such areas, to make their development plans, to revise existing plans of every scale and planning decisions and to approve them acting on its own initiative. SEP Zones are declared by the Council of Ministers in accordance with this Law.

4. Terrestrial Hunting Law (4915- 01.07.2003): This Law includes provisions concerning the conservation and development of game and wild animals together with their natural habitats for sustainable hunting and wildlife management, the control of their hunting, the regulation of hunting, the utilization of hunting resources in such a way as to benefit the national economy, and cooperation with relevant public and private legal entities. Wildlife protection and generation areas are established in accordance with this Law. The "Regulation for Protecting Game and Wild Animals and Their Habitats and for Combating Their Pests", issued on the basis of the Law, sets forth the procedures and principles concerning the conservation of game and wild animals and of their habitats, the relocation of species, their placement, measures of protection, their hunting and collection from the wild, the management of predatory species and the combat against harmful ones, their diseases and their pests and includes provisions related to the species of game and wild animals, their survival and conservation in the natural environment, their areas of protection and habitats, the catching and collecting of them, scientific research on them, the ringing and marking of them, their diseases and penalties. This Law does not cover aquatic species.

5. The Regulation for the Protection of Wetlands: Prepared with a view in particular to implementing the Convention on Wetlands of International Importance, Especially as Waterfowl Habitat (the Ramsar Convention), this Regulation sets forth the principles for the protection and development of all wetlands, having or not having international importance, and for cooperation and coordination between agencies involved in this area.

6. Law on Aquatic Products (1380-04.04.1971): This Law includes basic provisions concerning the conservation, hunting, production, marketing, health and control of aquatic species found in seas and inland waters and other provisions concerning procedures, principles, prohibitions, restrictions, obligations and measures in other issues such as harmful and polluting substances prohibited from being discharged in production areas.

7. The Forest Law (6831-31.08.1956): States principles concerning forest management such as the planning, operation and conservation of forests. Protection forests, gene protection forests and seed stands are designated under this Law.

8. The Regulation on the Collection, Production and Exportation of Natural Flower Bulbs: Sets forth principles concerning the collection from the wild, production, growing and storing of and domestic and foreign trade in seeds, bulbs or other parts of natural bulbous flowers without destroying and depleting their population.

9. The Regulation for Implementing the Convention on International Trade in Endangered Species of Wild Fauna and Flora: Sets forth procedures and principles for the control of international trade in fauna and flora species covered by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) to ensure their sustainable use.

10. The Law for the Protection of Animals (5199- 24.06.2004): Aims to ensure animal welfare and proper treatment of animals, to protect them in the best manner from pain, suffering and cruelty and to prevent all kinds of ill-treatment.

11. The Apiculture Regulation: The aim of this Regulation are to set forth basic principles concerning apiculture, research, identification, protection and improvement of gene resources, the formation of new lines for bee-raising, the imports and exports of breeding material, and the commercial raising of queen bees, to determine and disseminate the criteria to be required for artificial insemination in beekeeping enterprises and to take measures for the protection of bee health.

Although the legal provisions for species and habitat conservation also serve to protect genetic resources, there are legal provisions introduced by the MARA directly for the protection of genetic resources. **They are as follows:**

1. The Regulation Concerning the Collection, Protection and Utilization of Plant Genetic Resources: For the purpose of protecting and developing Turkey's plant genetic resources, this Regulation sets forth principles concerning their survey, collection and the protection, conservation, production, replacement, characterization, assessment, documentation and exchange of collected material. The National Gene Bank and Herbarium has been established under this Regulation, which also covers the issue of permits for research on plant genetic resources.

2. The Regulation Concerning the Protection of Animal Genetic Resources: Sets forth procedures and principles concerning the determination of the genotypic and phenotypic characteristics of Turkey's animal genetic resources, their breeding for conservation, and the recording and conservation of those characteristics.

3. The Animal Improvement Law (4631-28.02.2001): This Law provides for all types of animal production and activities to render such production more effective, for improvement efforts to increase the productivity of animals raised for racing, competition or business, for protecting the gene resources of domestic and wild animals, for making animal production more efficient and competitive, for activities related to these matters, for the keeping of pedigree records, for the improvement of animal races, for the raising of breeding animals in healthy and hygienic conditions and their transfer to producers free from diseases and for their protection.

4. The Law for the Protection of Improver's Rights Concerning New Plant Varieties (5042-08.01.2004): The aim of this Law is to encourage the development of plant varieties and to

ensure the conservation of new varieties and of improver's rights. This Law covers all plant species.

5. The Seed-Raising Law (5553-31.10.2006): Replaced Law 308 of 21.08.1963 on the Registration and Certification of Seeds in order to improve quality and yield in crop production, to provide quality assurance for seeds, to make provisions concerning seed production and trade and to implement the necessary actions for restructuring and development of the seed-raising sector. Decree-Law 551 for the Protection of Patent Rights, put into force on 24.06.1995, is intended to protect inventions by issuing patents or utility model certificates in order to encourage the activity of making inventions and to achieve technical, economic and social progress through the application of inventions to industry. It is also a legislative measure concerning genetic resources in the scope of the protection of intellectual property rights on biotechnological inventions. The application and authorization procedures for research work in Turkey by foreign scientists are determined by the "Principles Governing Foreigners Wishing to Undertake Scientific Research and Studies or to Shoot Films in Turkey, or Persons Applying in Their Name, and Foreign Press Members" which were put into force through Council of Ministers Decision 88/12839 of 4 April 1988.

The laws and regulations that may contribute to the sustainable use of biological diversity and that include provisions concerning the management of resource use are the following:

1. The Forest Law (6831-31.08.1956): Sets forth principles concerning forest management such as the planning, operation and conservation of forests.

2. The Pastures Law (4342-25.02.1998) and the Pastures Regulation: They were put into force with the aim of ensuring the use of pastures, summer quarters, winter quarters, grazing areas and meadows in accordance with rules to be set, carrying out their maintenance and improvement, increasing and sustaining their productivity, continuously supervising their use, and changing their purpose of use when required.

3. The Coastal Law (3621/3830-04.04.1990): Sets forth principles for the conservation of sea, natural and artificial lake and river coasts and of the coastal strips that are under their influence and an extension of them, considering their cultural and natural characteristics, and for their use for public benefit.

4. The Agriculture Law (5488-18.04.2006): Includes procedures and principles for determining the goals, scopes and subjects of agricultural policies, defining the goals and principles of agricultural support policies and the basic support programmes, determining the market regulations, financing and administrative structure related to the implementation of these programmes and making the legislative and administrative arrangements related to the priority research and development programmes to be implemented in the agricultural sector. It includes the conservation and development of natural and biological resources among the goals of agricultural policies and charges the MARA with the duty of conducting research for the conservation and development of biological diversity, genetic resources and ecosystems.

5. The Soil Protection and Land Use Law (5403-03.07.2005): Sets forth procedures and principles to ensure the conservation and development of soil by preventing its loss and degradation through natural or artificial ways and the planned use of land in accordance with the principle of sustainable development giving priority to the environment.

6. The Law on National Mobilization for Afforestation and Erosion Control (4122-23.07.1995) and the Regulation on Afforestation: Specify principles and procedures concerning the activities of afforestation and erosion control to be undertaken by governmental agencies and natural and legal persons in order to enhance the forest area and forest wealth, to restore and improve the balance between soil, water and plants and to protect environmental values. The Regulation sets forth principles concerning the activities of afforestation, erosion control, pasture improvement, tree improvement, seed production, nursery and energy forest establishment, development and restoration to be undertaken in accordance with the provisions of Forest Law 6381.

7. The Organic Farming Law (5262-01.12.2004) and Regulation: They were put into force with the aims of protecting the ecological balance, conducting activities of organic farming, and regulating, developing and spreading organic agricultural production and marketing.

8. The Regulation on Good Agricultural Practices: It was put into force with the aims of conducting agricultural production not harmful to the environment and to human and animal health, protecting natural resources and ensuring traceability and sustainability in agriculture and food safety.

9. The Regulation Concerning the Protection and Use of Agricultural Land: This Regulation sets forth procedures and principles related to ensuring the conservation of agricultural land and its use in accordance with its intended purpose and the exceptional cases in which such land may be used for non-agricultural purposes. Agricultural Control and Agricultural Quarantine Law 6968 of 15.05.1957 and Animal Health and Surveillance Law 3285 of 08.05.1986 rank first among the legislation to ensure the border control, for both health and conservation purposes, of living species that will enter or leave Turkey. In addition, Anti-Smuggling Law 5607 of 19.07.2003, in force since 1932 and updated in 2003 and Customs Law 4458 of 27.10.1999 regulate border controls.

ANNEX II
NATIONAL PRACTICES IN THEMATIC AREAS

National Practices in Agricultural and Steppe Ecosystems

The In-situ Conservation of Plant Genetic Diversity Project, which was implemented with GEF/WB funding, together with the concurrent Agricultural Research Project (ARP), which was implemented in the 1991-2001 period, contributed considerably to the identification of agricultural biological diversity, its conservation and management as well as capacity building. This has led to the initiation of Master Plan activities and the establishment of Research Advisory Committees and of a Research Council. Activities are reviewed annually at programme evaluation meetings.

The research programmes on natural resources conducted by the research institutes of the Directorate General of Agricultural Researches, an affiliate of the Ministry of Agriculture and Rural Affairs, are assisted through this system. A result of this ongoing 57 and another planned 4 field studies on natural resources and environment are conducted. Among some case studies are: the cultivation of certain wild plants like thyme and sage, which are gathered from the wild; the introduction of new species and varieties into ornamental plants sector; the collection of genetic resources of the wild relatives of the cultivated crops, their characterization, conservation and utilization; the determination of use potentials of Turkey's agricultural ecological areas and products; stock improvements for at-risk fish species; the identification of impacts of fish farms on marine ecosystems and the conservation of wild species and local varieties by farmers.

Regarding Turkey's plant genetic diversity, the In-situ Conservation of Plant Genetic Diversity National Plan was adopted in 1998. The plan determines legal, institutional and financial requirements for the in-situ conservation of the species that are important for agriculture, food, economy and culture (www.bcs.gov.tr).

National Practices in Forest and Mountain Ecosystems

The National Parks and Conservation Zones Management, Biological Diversity Conservation and Rural Development Project, which was implemented in the Küre Mountains National Park in Bartın and Kastamonu, the Biological Diversity and Natural Resources Conservation and Sustainable Development in the Yıldız Mountains Project and the Sustainable Forest Utilization and Conservation in the Kaçkar Mountains Project are the three examples showing the practices which were implemented or are ongoing for the conservation of the mountain ecosystems and their sustainable management.

The National Parks and Conservation Zones Management, Biological Diversity Conservation and Rural Development Project was designed and implemented between 1997 and 2000 by the Directorate General of National Parks and Hunting-Wildlife of the Ministry of Forestry, with the United Nations Development Programme (UNDP) and the United Nations Food and Agriculture Organization (FAO) funding. The project area is the Küre Mountains National Park in Kastamonu and Bartın provinces in the Western Black Sea region. The project aimed at training of the DG of National Parks and Hunting-Wildlife staff on conservation zone planning, and designing a management plan for the national park, which was intended to be designated, to serve as a model for the management of other conservation zones. After the project, the area lying between Kastamonu and Bartın provinces was given a National Park

status (18 May 2000) because of its national and international importance regarding natural (geological, geomorphological, etc.), cultural, aesthetic and, in particular, biological (old and virgin forest, wildlife) diversity.

The Küre Mountains Draft Development Plan, a guide to conservation and sustainable management of the area's resource values, has been prepared so that the area is managed in an integrated way with its surroundings and also a participatory approach has been pursued while drafting the plan. As a result, a model plan for the management of other conservation zones has been developed.

For the conservation and effective management of the area designated as the National Park, the studies have been conducted with active involvement of local people, the relevant governmental agencies and organizations as well as voluntary organizations and universities in order to build and maintain an organic relationship between the national park and its close proximity in a sustainable manner.

At the end of the project;
- The Küre Mountains was given a national park status (an area covering 37,000ha was designated as the national park and the buffer zone concept was introduced to secure biological diversity, which was the first national park to be protected in Turkey), a draft management plan for the area was prepared, eco-tourism practices which aim to serve for the conservation of the traditional life style and architectural structure and cultural values of the area, in particular, were supported, and even an old house was restored and an Eco-tourism Centre was opened there.

- With the project, the buffer zone concept was introduced to cover the area surrounding the national park in order to secure the biological diversity, which was aimed to be protected in a national park in Turkey for the first time, against any likely threats from the close proximity of the park. Totally an area of 117,000ha added with 80,000ha buffer zone was studied and decisions were taken on it.

The Biological Diversity and Natural Resources Conservation and Sustainable Development in the Yıldız Mountains Project was incorporated in the 2006 programme within the framework of the EU-Turkey Financial Cooperation within the scope of cross-border Cooperation with Bulgaria. The project is being implemented with the coordination of the DG of Natural Conservation and National Parks and DG of Forests of the MEF.

The overall objective of the project is to promote and improve trans-border cooperation for the conservation and sustainability of biological diversity and natural resources. To this end, it is assumed to build wide scale inventories (for natural and social data) pursuing a Biosphere Reserve approach in the Yıldız Mountains and to establish a natural training centre to train children, in particular, and raise awareness among people.

With the project, it is aimed to protect the mountains, forests, wetlands and coastal ecosystems of the Yıldız Mountains, and to introduce sustainable development practices. It is assumed that, based upon the data obtained after the studies to be conducted in an area of around 130,000 ha, the area can be designated as a Biosphere reserve pursuing the Biosphere reserve approach.

The Sustainable Forest Utilization and Conservation in the Kaçkar Mountains Project is being implemented with the partnership of the Biology Department of the Middle East Technical University (METU) and the Natural Conservation Centre (NCC), DG of Forests, Artvin Culture and Solidarity Association and DG of National Parks as an EU-financed project under the coordination of the TEMA Foundation.

The Project area is the Kaçkar Mountains (Hatilla Valley National Park, Altıparmak Mountains, Verçenik Wildlife Conservation Zone, Kaçkar Mountains National Park, Barhal Valley, Yusufeli). With the project, it is aimed to slow down biological diversity losses and the destroying of forest ecosystems in the Kaçkar Mountains, one of the hot points in the world and to achieve improvement in this area.

National Practices in Inland Water Ecosystems

In Turkey, 135 wetlands with international importance have been identified (www.cevreorman.gov.tr). Due to the fact that those wetlands show different ecological and hydro-geological characteristics, data collection and inventory building studies as well as data update for each wetland are underway currently. So far, more than 1,000 studies have been conducted on inland waters biological diversity. 12 wetlands of Turkey have been designated as Ramsar Sites (Table 9 below).

The MEF has been awarding projects for the conservation of Turkey's wetlands. Those projects are collected under two headings: inventory and management plan studies. The Research of Wetlands Having International Importance from Biological and Ecological Aspects Project, as well as the inventory studies concerning the Seyhan Delta, Ceyhan Delta, Sultan Reed, Lake Seyfe, Lake Tuzla (Palas), Lake Tuz, Lake Samsam, Lake Kulu, Reed Lake Kozanlı, Lake Çöl, Lake Uyuz, Lake Bolluk, Lake Tersakan, Eşmekaya Reeds, Küçük Menderes Delta, Büyük Menderes Delta and Lake Bafa, Güllük Reeds, Lake Köyceğiz, Lake Salda, Lake Çorak, Lake Eğirdi, Lake Karataş, Lake Yarışlı, Lake Kovada, Karamık Marsh, Lake Eber, Lake Akşehir, Lake Çavuşçu, Hotamış Reeds, Lake Beyşehir, Lake Burdur, Lake Marmara, Lake Acı, Hirfanlı Dam, Homa Pond, Çamaltı Salt Marsh, and Lake Işıklı have been completed. With the above projects, both physical and chemical analyses have been made and the fact-finding work has been completed in the wetlands covered by projects, together with the identification of their biological and ecological features. Also, both the environmental problems and the threats to the environmental values in the wetlands covered by projects have been identified and pollution maps have been prepared.

The conclusions drawn will shed light on the future practices and allow taking measures and formulating recommendations for current problems. The design work of Wetlands Management Plan Projects in Burdur and Manyas Lakes and the Göksu and Gediz Deltas under the Wetlands Management Project has been awarded and that work has been completed and the projects have been put into force following their approval by the National Wetlands Committee. With those projects, explorations have been conducted in the mentioned wetlands to identify their natural environmental characteristics and their potentials for the utilization of natural resources and identify their socio-economic features followed by an assessment work. The management plan project activities are currently also underway in the Kızılırmak Delta, Lake Burdur, Lake Akşehir and Lake Eber, Sultan Reed, İğneada Longoz, Yumurtalık Lagoon, Ekşisu Reed in Erzincan, Lake Eğirdir, and Lake Gölbaşı in Adıyaman.

Name of the site	Province	Area (ha)
Lake Uluabat	Bursa	13500
Lake Kuş	Balıkesir	16000
Delta Göksu	Mersin	14480
Lake Akyatan	Adana	14000
Delta Gediz	İzmir	20400
Lake Burdur	Burdur	25000
Lake Sultansazlığı	Kayseri	39000
Lake Seyfe	Kırşehir	19500
Delta Kızılırmak	Samsun	21700
Lagoon Yumurtalık	Adana	16430
Swallow hole Kızören	Konya	127
Meke Maar	Konya	314

Table 9. Ramsar sites of Turkey

Some studies have been adopted for an integrated land and discharge basin management for the purposes of the conservation, utilization, planning, management, and monitoring of inland waters biological diversity. The pilot projects on this have already been initiated, e.g. the management plan projects on the Konya Closed Basin, Lake Beyşehir, Lake Tuz Special Environmental Conservation Zone, Göksu Delta, and Sultan Reed.

National Practices in Coastal and Marine Ecosystems

In Turkey, the actions for the conservation of coastal and marine biological diversity are taken based on the area and species conservation concepts. National Parks covering coastal and, partly, marine ecosystems, Nature Conservation Zone, Natural Park, Wetlands Having International Importance (Ramsar) and Special Environmental Conservation Zone are all the statuses given in the frame of area conservation concept. Çamburnu Nature Conservation Zone (Artvin), Hacıosman Forest Nature Conservation Zone (Samsun), İğneada Longoz Forests National Park (Kırklareli), Hamsilos Nature Park and Sarıkum Nature Conservation Zone (Sinop) lie along the Black Sea coasts. Also, the Kızılırmak Delta is a Ramsar area. The Gelibolu Penisula Historical National Park (Çanakkale), Ayvalık Islands Natural Park (Balıkesir), Special Environmental Conservation Zone in Foça (İzmir), Dilek Penisula-Büyük Menderes Delta National Park (Aydın), and the Gediz Delta Ramsar area are under conservation. Muğla, which is located at the junction of the Aegean and the Mediterranean, has a long indented shoreline and special habitats. In Muğla, there are seven protected areas. These include: Marmaris National Park, Ölüdeniz – Kıdrak Natural Park, Datça-Bozburun Special Environmental Conservation Zone, Köyceğiz-Dalyan Special Environmental Conservation Zone, Fethiye-Göcek Special Environmental Conservation Zone, Gökova Special Environmental Conservation Zone and Patara Special Environmental Conservation Zone. There are seven protected areas along the Mediterranean coast, 4 of which are in the Antalya province. (These include: Olimpos – Beydağları Shore National Park, İncekum Natural Park, Yumurtalık Lagoon Nature Conservation and Ramsar Area, Belek Special Environmental Conservation Zone, Göksu Delta Special Environmental Conservation Zone, Kaş-Kekova Special Environmental Conservation Zone, Göksu Delta Ramsar Area.)