

PERFORMING A REVIEW OF THE NATURAL RESOURCES & BIODIVERSITY SECTOR IN TURKEY



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This report was prepared by Doğa Koruma Merkezi (DKM) for the French Development Agency (Agence Française de Développement- AFD). The observations, evaluations and recommendations contained in this report do not reflect the views of the AFD.

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List of acronyms

<i>AFD</i>	<i>French Development Agency</i>
<i>BMUB</i>	<i>German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety</i>
<i>BMZ</i>	<i>German Federal Ministry for Economic Cooperation and Development</i>
<i>BP</i>	<i>British Petroleum</i>
<i>BTC-EIP</i>	<i>Baku-Tbilisi-Ceyhan Pipeline Company Environmental Investment Programme</i>
<i>CBA</i>	<i>Cost-Benefit Analysis</i>
<i>CBD</i>	<i>UNESCO's Man and Biosphere Program</i>
<i>CITES</i>	<i>Convention on International Trade in Endangered Species of Wild Fauna and Flora</i>
<i>COMDEKS</i>	<i>Community Development and Knowledge Management for the Satoyama Initiative</i>
<i>COP</i>	<i>Conference of the Parties</i>
<i>CR</i>	<i>Critically Endangered</i>
<i>CSR</i>	<i>Corporate Social Responsibility Programmes</i>
<i>DHKD</i>	<i>Doğal Hayatı Koruma Derneği; Turkish Society for the Protection of Nature</i>
<i>DKM</i>	<i>Doğa Koruma Merkezi; Nature Conservation Centre</i>
<i>EBRD</i>	<i>European Bank for Reconstruction and Development</i>
<i>EC</i>	<i>European Commission</i>
<i>ECEAT</i>	<i>European Centre for Ecological and Agricultural Tourism</i>
<i>ECRAN</i>	<i>Environment and Climate Regional Accession Network Project</i>
<i>EIA</i>	<i>Environmental Impact Assessment</i>
<i>EIB</i>	<i>European Investment Bank</i>
<i>EN</i>	<i>Endangered</i>
<i>EU</i>	<i>European Union</i>
<i>EVS</i>	<i>European Voluntary System</i>
<i>FAO</i>	<i>Food and Agriculture Organization of the United Nations</i>
<i>FCO</i>	<i>UK Foreign Office</i>
<i>FED</i>	<i>Forest Enterprise Directorate</i>
<i>FFEM</i>	<i>Fond Français pour l'Environnement Mondial</i>
<i>GAA</i>	<i>Government Aid Agency</i>
<i>GDF</i>	<i>General Directorate of Forestry</i>
<i>GDNAP</i>	<i>General Directorate of Natural Assets Protection</i>
<i>GDP</i>	<i>Gross Domestic Product</i>
<i>GEF</i>	<i>Global Environment Fund</i>
<i>GIS</i>	<i>Geographic Information System</i>
<i>GIZ</i>	<i>German International Cooperation</i>
<i>HNV</i>	<i>High Nature Value</i>
<i>IBA</i>	<i>Important Bird Area</i>
<i>IEEP</i>	<i>Institute for European Environmental Policy</i>
<i>IFAD</i>	<i>International Fund for Agricultural Development</i>
<i>IPA</i>	<i>Important Plant Area</i>
<i>IPBES</i>	<i>United Nations International Governmental Platform on Biodiversity and Ecosystem Services</i>
<i>IPCC</i>	<i>Intergovernmental Panel on Climate Change</i>

<i>IUCN</i>	<i>International Union for Conservation of Nature</i>
<i>JICA</i>	<i>Japan International Cooperation Agency</i>
<i>KBA</i>	<i>Key Biodiversity Area</i>
<i>MARA</i>	<i>former Ministry of Agriculture and Rural Affairs</i>
<i>METU-SAS</i>	<i>Middle East Technical University Under Water Sports</i>
<i>MPA</i>	<i>Marine Protected Area</i>
<i>NBSAP</i>	<i>National Biological Diversity Strategy and Action Plan</i>
<i>NGO</i>	<i>Non-Governmental Organization</i>
<i>NT</i>	<i>Near Threatened</i>
<i>NTFP</i>	<i>Non-timber Forest Products</i>
<i>OMO</i>	<i>Chamber of Forest Engineers</i>
<i>ORKOOP</i>	<i>Central Union of Forest Cooperatives</i>
<i>ORKÖY</i>	<i>Forest Village Relations Department</i>
<i>PBA</i>	<i>Prime Butterfly Area</i>
<i>RAC/SPA</i>	<i>Regional Activity Center for Specially Protected Areas</i>
<i>RDI</i>	<i>Research, Development and Innovation</i>
<i>RENA</i>	<i>Regional Environmental Network for Accession Project</i>
<i>SAD</i>	<i>Sualtı Araştırmaları Derneği; the Under Water Research Association</i>
<i>SAD-AFAG</i>	<i>Under Water Research Association Mediterranean Monk Seal Research Group</i>
<i>SCP</i>	<i>Systematic Conservation Planning Approach</i>
<i>SEA-Med</i>	<i>Sustainable Economic Activities in Mediterranean Marine Protected Areas Project</i>
<i>SEPA</i>	<i>Special Environmental Protection Area</i>
<i>TA</i>	<i>Technical Assistance</i>
<i>TATUTA</i>	<i>Eco-Agro Tourism and Voluntary Exchange Farms Project</i>
<i>TEIEN</i>	<i>Technical Assistance for Establishment of a Turkish Environmental Information Exchange Network</i>
<i>TEMA</i>	<i>The Turkish Foundation for Combating Soil Erosion, for Reforestation and the Protection of Natural Habitats</i>
<i>TEV</i>	<i>Total Economic Value</i>
<i>TKDK</i>	<i>Agriculture and Rural Development Support Institution</i>
<i>TMO</i>	<i>Turkish Grain Board</i>
<i>TSKB</i>	<i>Türkiye Sınai Kalkınma Bankası</i>
<i>TÜGEM</i>	<i>former General Directorate for Development of Agricultural Production</i>
<i>TÜSİAD</i>	<i>Turkish Industry and Business Action</i>
<i>UN</i>	<i>United Nations</i>
<i>UNCCD</i>	<i>United Nations Convention to Combat Desertification</i>
<i>UNDP</i>	<i>United Nations Development Programme</i>
<i>UNDP-GEF-SGP</i>	<i>United Nations Development Programme Global Environment Fund Small Grants Program</i>
<i>UNEP</i>	<i>United Nations Environment Program</i>
<i>WBCSD</i>	<i>World Business Solutions for a Sustainable World</i>
<i>WFD</i>	<i>Water Framework Directive</i>
<i>WWF</i>	<i>World Wide Fund for Nature</i>
<i>WWOOF</i>	<i>World Wide Opportunities on Organic Farms</i>
<i>YADA</i>	<i>Yaşama Dair Vakıf; YADA Foundation</i>

EXECUTIVE SUMMARY

Biodiversity is of great importance and value for the Turkish economy

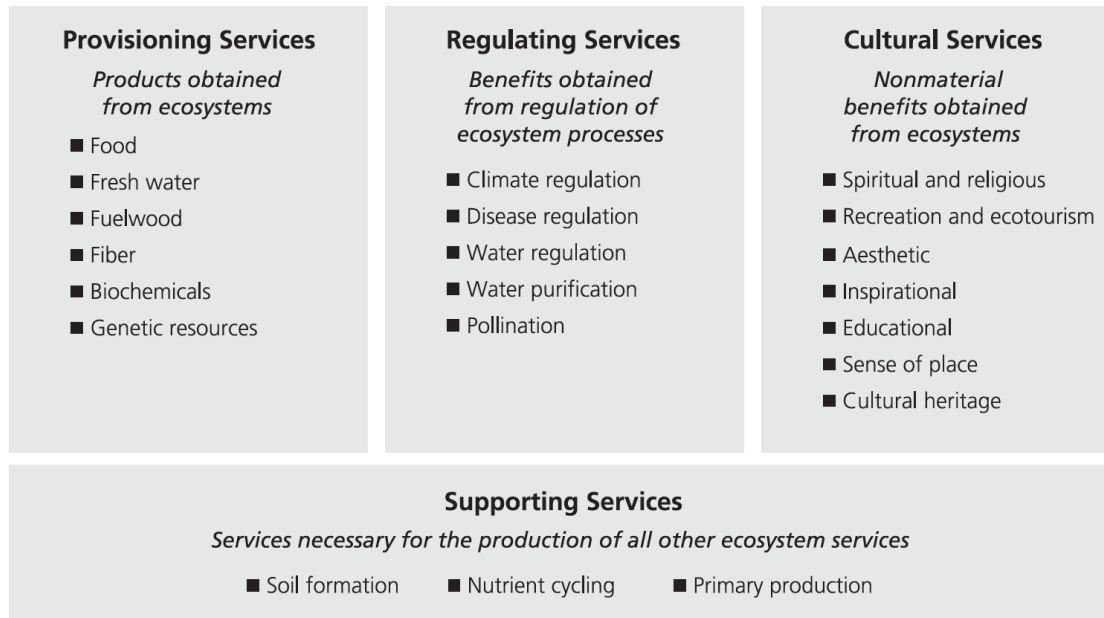
Biodiversity conservation refers to the conservation of genes, species, habitats, ecosystems and ecological processes, to secure in the long term resources of environment, to provide food, clothes, fuel, medicine and beauty to mankind today and tomorrow.

Turkey is among one of the very few countries, which retained most of its natural habitats and biodiversity therein. It is one of the rare countries, which hosts 3 out of the 34 biodiversity hotspots in the world. Being situated at the convergence zone of Asia, Europe and Africa; the country has acted as a bridge between continents and their corresponding flora and fauna. Today, many wild animals and plant species can still be found in their native ecosystems in Anatolia. With >10,000 plant species, > 380 butterfly, >160 mammal, app. 250 freshwater fish, almost 130 reptiles, >30 amphibian, up to 500 marine fish and nearly 480 bird species, Turkey is a country holding a high biological diversity.

Efforts to identify areas of high biodiversity importance for single or multiple species groups in Turkey have resulted in the delineation of 255 Important Bird Areas (IBA; Eken et al., 2006), 305 Key Biodiversity Areas (KBAs focusing on 7 species groups; Eken et al., 2006), 122 Important Plant Areas (IPAs; Özhatay et al., 2003) and 65 Prime Butterfly Areas (PBAs; Karaçetin et al., 2011), reflecting the high biodiversity value of the country. Studies not focusing on single species groups but based on other approaches were also carried out in Turkey. One of these, the Systematic Conservation Planning (SCP) studies have been carried out in 6 regions between 2000 and 2010 in Turkey covering nearly one third of Turkey, namely: Mediterranean, Southeast Anatolia, Lesser Caucasus, Aegean, Anatolian Diagonal and Black Sea Regions (Welch, 2004; Zeydanlı et al., 2005; Turak et al., 2011). These areas reflect the sites holding most unique and also threatened elements of Turkey's biodiversity.

The biodiversity of Turkey is also reflected in the different ecosystems the country hosts. Many elements of Turkey's globally important biodiversity are found in steppes and forest steppes of Anatolia (Ambarlı et al., *in prep*). Mountain ecosystems in Turkey host diverse biological elements adapted to different climatic conditions given the high altitudinal changes in very small scales. Depending on the altitude, geographical position, aspect, and climate type, they can have vegetation covered by forests, woodlands, shrublands and grasslands. Forests, another important ecosystem type in Turkey, show great difference in their structure, composition and processes; from west to east and from north to south. With its rivers and lakes covering an area of about 10,000 km², 7 drainage basins, including 26 river basins, Turkey has very important wetland ecosystems with 14 designated as important at the international scale (i.e. Ramsar Sites). Finally, being surrounded by three seas of very different characteristics, Turkey has a significant marine and coastal diversity, hosting many rare species from different groups.

The high biodiversity Turkey hosts is not only important from a purely conservation point of view, but also important for the sustainable use of natural resources, and thus the socio-ecological dynamics. In other words, Turkey also hosts a high diversity of the goods and services provided by different ecosystems (the classical ecosystem goods and services, see table below).



Ecosystem goods and services (Source: United Nations Environment Programme; www.unep.org).

Particularly, the goods and services provided by forest ecosystems are important for the 7 million forest villagers whom are dependent on forest ecosystems for living (industrial wood production, fuelwood production, non-timber forest production, ecotourism, water production, etc.).

The significant biodiversity of the coastal and marine ecosystems generate significant income for the country. According to 2014 official statistics, 231,058 tons of different fish species; 35,019 individuals of marine species were caught and traded in the market. Besides the fishery, the coastal and sea tourism constitutes an important income for the country (20% of the 34 billion USD of total tourism income). As well as coastal and marine ecosystems, wetland ecosystems, which are the main suppliers of water to different sectors in Turkey, have an international importance. Unfortunately, given high importance of hydro-energy production at the national scale, wetland ecosystems are specifically subject to high-intensity threats.

Steppes in Anatolia, where agriculture is one of the major economic activities benefiting from these ecosystems, deserve attention with diverse grassland communities, high plant species diversity and endemism rate and populations of globally threatened animal species. However, steppe ecosystems are one of the least presented ecosystems in the legal protected area network in Turkey, whereas it is a crucial condition for livestock development.

Objective and method of the mapping

This report has been prepared by Doğa Koruma Merkezi (DKM) for the French Development Agency (AFD; Agence Française de Développement) in order to provide a mapping of areas important for Turkey's biodiversity, the threats to the country's biodiversity, the legal and institutional framework, the main stakeholders (including ministries, international donors, non-governmental organizations, private sector) and their actions for biodiversity conservation. This mapping was intended to identify potential intervention areas for AFD.

During the preparation of this report; a total of 45 interviews were carried out with different stakeholders and a total of 64 experts were contacted between 30 July 2015 and 11 December 2015. During the interviews, a set of questions were raised to the stakeholders to gather their opinion on priorities at the national scale regarding the major problems/threats and urgent priority fields of action towards sustainable natural resource use and more specifically biodiversity conservation.

A high number of suggestions were collected during the interviews and following further analysis, 8 priority topics were identified for AFD's potential support. At the end of this mapping procedure, the main investment needs identified for the biodiversity sector were screened according to the various types of possible interventions (i.e. in terms of studies, technical assistance, financing through loans or grants).

Economic growth means rising threats to environment, via quick urbanization, correlated fossil energy demand, direct pollution and overexploitation of natural resources

Different types of human activities threaten different elements of the biodiversity in Turkey and bring many species to the verge of extinction. There are no national scale red list assessments in Turkey yet, however it can be concluded that the pilot studies on different species groups are representative of the status of biodiversity. Plants are among the species groups facing serious threats due to human activities. According to the red list assessment, approximately 600 of endemic plant species are "Critically Endangered" (CR) and about 700 are "Endangered" (EN). Of the 385 butterfly species distributing in the country, 27 are threatened with extinction at national scale and 11 are near threatened (NT), corresponding in total to almost 10% of the species. Also, according to an assessment on the herpetofauna of Turkey, 17 of the amphibian species and 24 reptile species are threatened with extinction or near threatened at the national level.

Exploitation of natural resources associated with human activities like agriculture, forestry and fisheries, as well as urbanization typically leads to disturbance and changes in the diversity of species and habitats. Infrastructure, transportation, intensive agricultural projects, energy investments, mining activities and urbanization are among the main threats acting on the ecosystems and the species they hold. One of the most degraded ecosystems in Turkey is the lowlands and plain steppe ecosystems, connected with agricultural practices

(e.g. intensification of farming activities, land abandonment) and partially urbanization and the other developments (e.g. public investments on transport, energy and industry). Wetland ecosystems are also heavily threatened due to urbanization, dam construction, change in hydrological regime, draining for agricultural purposes, poaching, and excessive irrigation. It is expected that climate change will further impact these fragile ecosystems, e.g. due to decrease in precipitation, decrease in snow cover and increase in temperature. Habitat degradation and destruction, pollution, and over-exploitation (especially overfishing) are the factors threatening many of Turkey's marine plant and animal species. Densely populated coasts experience large-scale habitat loss, disturbance, and pollution from rapidly increasing residential and tourism development, especially in the Aegean and Mediterranean coastlines. Finally, even if forests are better protected and managed in comparison to other ecosystem types in Turkey, especially in the Mediterranean Region, forest ecosystems are expected to be drastically affected by the adverse effects of the climate change. Forest fires, urbanization and expansion of industrial and urban areas into mountain zones are also among the factors threatening forests and their biodiversity.

Climate change is reinforcing the direct effects of growth, calling for structural changes

The Intergovernmental Panel on Climate Change (IPCC) defines climate change as a statistically significant variation in variables that define the climate of a region (such as temperature or precipitation) or in its variability persistent over an extended period of time (typically decades or longer periods). Today climate change is accepted as one of the most serious challenges facing the world – the people, the environment and economies. Turkey is among the countries, which will be significantly affected by climate change in the Mediterranean Region. Especially the fragile ecosystems and the species the country hosts will be prone to negative impacts. Undeniably, climatic changes and the resulting vulnerabilities will have serious social, economic and environmental impacts in the country.

Unfortunately there are not many studies assessing the possible impacts of climate change on species and ecosystems in Turkey. One example to these studies was carried out in the Seyhan River Basin in the Mediterranean Region (Zeydanlı et al. 2010), and focused on predicting the impact of climate change on four main forest types, namely Taurus fir (*Abies cilicica*), cedar (*Cedrus libani*), black pine (*Pinus nigra*), Turkish pine (*Pinus brutia*). Through modeling studies it was shown that there will be significant decreases in habitat suitability for these four species in the pilot site (e.g. a 97% decrease was expected in *Abies cilicica* by 2080). There is a need to carry out more studies on different regions, focusing on a variety of species in order to develop predictions, to better understand changes that will arise as a result of climate change, and to come up with adaptive management options.

Conservation efforts in Turkey

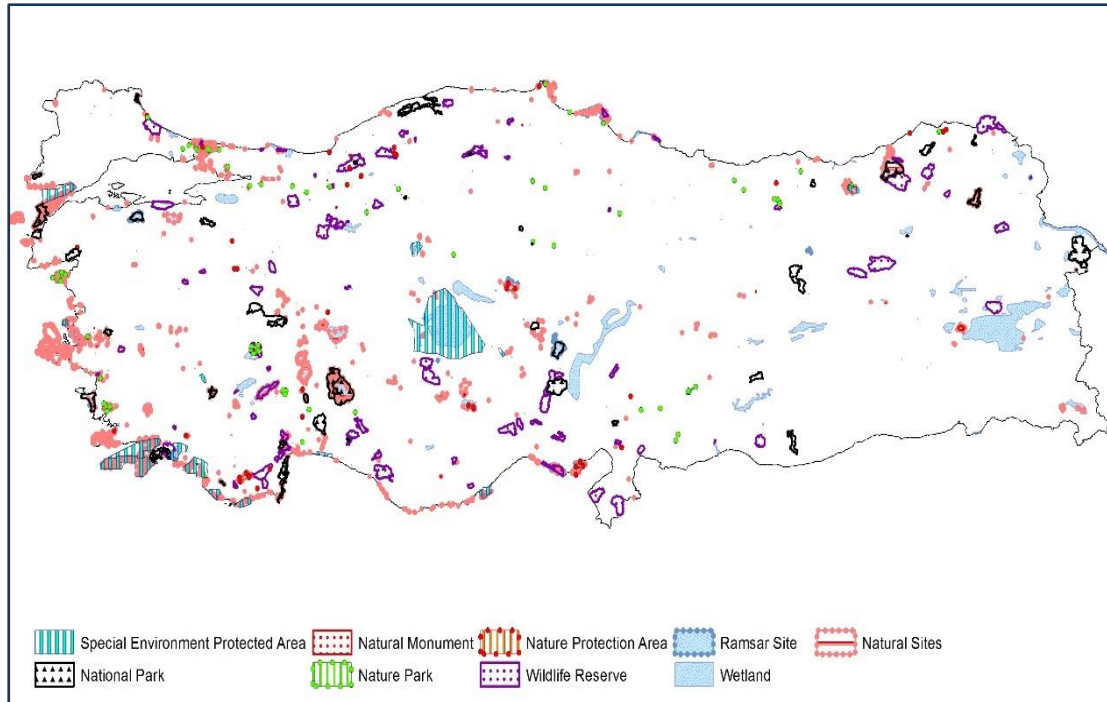
Turkey has the legal tools to act towards the conservation of biodiversity and sustainable management of natural resources from the constitution itself and also from the obligations under a number of laws and by-laws. Different governmental institutions are responsible from the implementation of these laws, but it is primarily three ministries which are directly

involved in biodiversity conservation and sustainable use of natural resources, namely the Ministry of Forestry and Water Affairs, the Ministry of Food, Agriculture and Livestock and the Ministry of Environment and Urbanization. Furthermore, there are different plans and strategies falling under the jurisdiction of different governmental institutions, which either directly or indirectly impact biodiversity and natural resources. National Biodiversity Strategy Action Plan (2007) and the National Wetland Strategy are two prime examples among these plans and strategies focusing directly on ecosystems and the species they host.

Turkey has also been subscribed to different obligations under various international conventions, agreements (including United Nations Climate Change Convention), and protocols for nature conservation and sustainable natural resource management. These obligations are met by different governmental institutions via different legislations. Besides, as an European Union accession country, due to on-going accession negotiations, Turkey should to take the necessary preparatory work to be able to prepare a list of possible *Natura 2000* protected area network of Turkey by the time of accession. Such an obligation however, may positively contribute to Turkey's effort to establish more systematic approach for designation and or reviewing the existing protected areas.

Although there are some gaps in the administrative and legislative structures, it appears that Turkey has the necessary experience, knowledge, human resources and infrastructure to develop effective nature conservation and protected areas networks. However, the overlapping duties and tasks of different departments under Ministry of Forestry and Water Affairs / Ministry of Environment and Urbanization) create coordination problems for effective nature protection and protected area management. The draft framework law on Biodiversity and Nature Protection may play a key role to overcome this challenge and for further alignment of Turkish legislation with the EU. However, according to the EU progress report (2014) the draft law needs some further revisions to be in compliance with the EU requirements.

Turkey uses *in-situ* and *ex-situ* conservation programmes to protect its biodiversity. *In-situ* conservation programmes such as National Parks, Nature Protection Areas, Nature Parks, Wildlife Reserves, Special Environmental Protection Areas, Natural Preservation Sites, Natural Monuments and Gene Conservation and Management Areas have been established gradually in Turkey since the 1950s. The total coverage of protected areas in Turkey is 7.24% (figures from the Ministry of Forestry and Water Affairs, 2015). However, the National Biodiversity Strategy and Action Plan identify the need to expand the protected areas network to 10%. This percentage is rather low in comparison to the *Natura 2000* network of protected areas representing 18% of the area of 27 Member States of the European Union.



Distribution of protected areas according to their statuses (Source: Ministry of Forestry and Water Affairs Data).

A growing concern for the future of biodiversity in Turkey, still mainly led by NGOs

Biodiversity does not refer exclusively to protected areas. Every project on the territory should be assessed on its predictable impacts on the environment (including urban areas or marine/coastal zones), prior to any decision.

Various stakeholders are directly or indirectly involved in biodiversity conservation and sustainable natural resource use in Turkey, from governmental institutions to private sector companies, from local non-governmental organizations (NGOs), universities to international organizations, from metropolitan municipalities to development agencies.

The actions and responsibilities of the Ministry of Forestry and Water Affairs, the Ministry of Environment and Urbanization and the Ministry of Food, Agriculture and Livestock, directly target natural resource management (forestry, agriculture, water resources, etc.), biodiversity conservation and protected areas in Turkey. Through government funds, government aid agency (GAA) supported projects, NGO projects from different funding resources, Corporate Social Responsibility Programmes, different studies and projects at local, regional and national scale are being carried out in Turkey. In between these organisations other than governmental bodies; NGOs focused more on pilot projects, monitoring and inventory projects, which are generally funded by international organizations, private companies or they are associated to some specific objectives of the governmental projects. However given the increasing economic development of Turkey during the second half 1990s up to 2010, a pronounced decline took place from the

international funds arriving in Turkey especially for NGOs working on biodiversity conservation.

Private companies generally do not implement themselves biodiversity conservation projects; but they work closely with NGOs (mainly business oriented NGOs) to fulfil their environmental responsibility activities (which are indirectly related to biodiversity conservation) and/or to develop sponsorship to improve their images. In comparison to international funds and government aid projects, the support from private sector companies and banks to biodiversity conservation and sustainable natural resource use under the CSR Programmes is rather small, yet this amount has increased in the recent past. According to the 2010 Report of the Corporate Social Responsibility Association of Turkey, among the ISO-100 Companies' CSR activities 23% focused on environment as one of the most important topics to support in Turkey.

The generous dividends of investing in the biodiversity deserve actions

Even if there is not always clear financial return in the short run rewarding a biodiversity-prone investment, nature offers quick and strong responses to protective actions. There is thus room for public action (internally or externally funded) to directly address environmental challenges or to offers economic actors some incentive condition to encourage better decision for people and for nature based on long-term approaches.

The focus of international supports, which were initially in the form of grants for small scale researches and projects dealing with threatened species and protected areas, is currently changing to support a large set of green actions seeking sustainable management of natural resources and actions against climate change. The change is especially more pronounced for the non-governmental organizations in Turkey.

Eight priorities were identified at the crossing of economic and ecological challenges:

- 1. Non-timber forest products:** Establishing an effective system for non-timber forest products and services for supporting local development in forest villages and carrying out stock analysis for selected NTFP.
- 2. Local development of villages and communities:** Supporting projects towards sustainable development of villages by the sea (fishing, ecotourism, agriculture, pescaturismo); and establishing new and innovative models for supporting forest villages.
- 3. Integrated river basin (watershed) management:** Supporting integrated river basin management (multisectoral decision making, participation for governance models, climate change models, water budgets, water allocation, ecosystem based approach) at pilot basins with a national scale vision.
- 4. Ecosystem services:** Creating a decision support mechanism (including a common database) for integrating ecosystem services into development plans at national and regional scales; via economic valuation studies on ecosystem goods and services.

5. Protected areas: As a tool for operational and effective management plans of protected areas (including marine protected areas) creating trademarks of protected areas at regional level and developing relevant strategies, action plans on specific products and developing models towards decentralized management of protected areas; establishing a national coastal and marine protected areas management and monitoring system (using SCP approach and delineating candidate *Natura 2000* sites), which includes management planning, developing governance models and management at site level, implementation, monitoring, and supporting local development; and developing models at candidate *Natura 2000* sites with nature conservation and sustainable development practices with the specific goal of demonstrating how development and conservation practices can be carried out in harmony.

6. Climate change, agriculture and biodiversity: Supporting work on food security by both taking into account sustainability of natural resources and enhancing agricultural production (e.g. climate smart agriculture and conservation agriculture practices, integrated pest management); supporting sustainable grazeland management (rehabilitation, infrastructure, climate change, biodiversity, management) planning and practices in different regions; creating governance models and setting environmental, social and economic criteria for increasing the operational power and impact of agricultural (fisheries) and forestry cooperatives; modelling the impact of climate change on different agricultural products (in terms of yield) and developing adaptation and mitigation measures on a product base; and supporting studies towards enhancing the organic content of soil (e.g. Biogas projects, restoration measures and sensitive agriculture practices).

7. Municipalities: Preparing and implementing Climate Change Strategy and Action Plan for metropolitan municipalities.

8. Private Sector: Developing certificates following international standards for different type of goods, products and processes specific to Turkey with an environmental notion; supporting private sector via banks or other credit lines for sustainable land management, conservation and restoration projects; and creating low carbon development tools (green growth; including biodiversity and land degradation) and mechanisms at national and regional levels.

1. OVERVIEW OF BIODIVERSITY AREAS IN TURKEY

General Information Concerning Turkey's Biological Diversity

Despite increasing environmental problems, Turkey is among one of the very few countries that retained most of its natural habitats and biodiversity therein. Today, many wild animals and plant species can still be found in their native ecosystems in Anatolia.

Turkey displays the character of a small continent in terms of the biological diversity it hosts. One of the prime reasons of this diversity is the implication of geological and climatic processes occurred during the continental drifts. As an outcome of these, Turkey is situated at the convergence zone of Asia, Europe and Africa and has acted as a bridge between these continents and their corresponding flora and fauna. Territory of Turkey also acted as a refuge during the glacial periods to living creatures. The adaptation of species to changing climatic zones following the ice ages also contributed to this high diversity. Furthermore, given its high altitudinal diversity, its diverse geological and topographic features, soil types, presence of different types of aquatic bodies (i.e. seas, lakes, rivers, and freshwater, salt water and mineral water lakes) and high number of closed river basins, in comparison to other countries located in the temperate zone, Turkey hosts a unique biodiversity.

Three phytogeographical regions (reflecting relationships between the distribution of plant species and geographical characteristics in the world) out of 37 identified in the world do overlap in Turkey, namely Euro-Siberian, Mediterranean and Irano-Turanian phytogeographical regions (Fig. 1; Davis, 1965-1985). Corresponding biogeographical regions identified in European Union are the Black Sea, Mediterranean and Anatolian Biogeographical Regions in order. The overlap of three phytogeographical regions leads to the remarkably high biodiversity the country hosts. There exists app. 10,000 plant species distributing in Turkey, app. 30% of which are endemic to the country (Ekim et al., 2000).

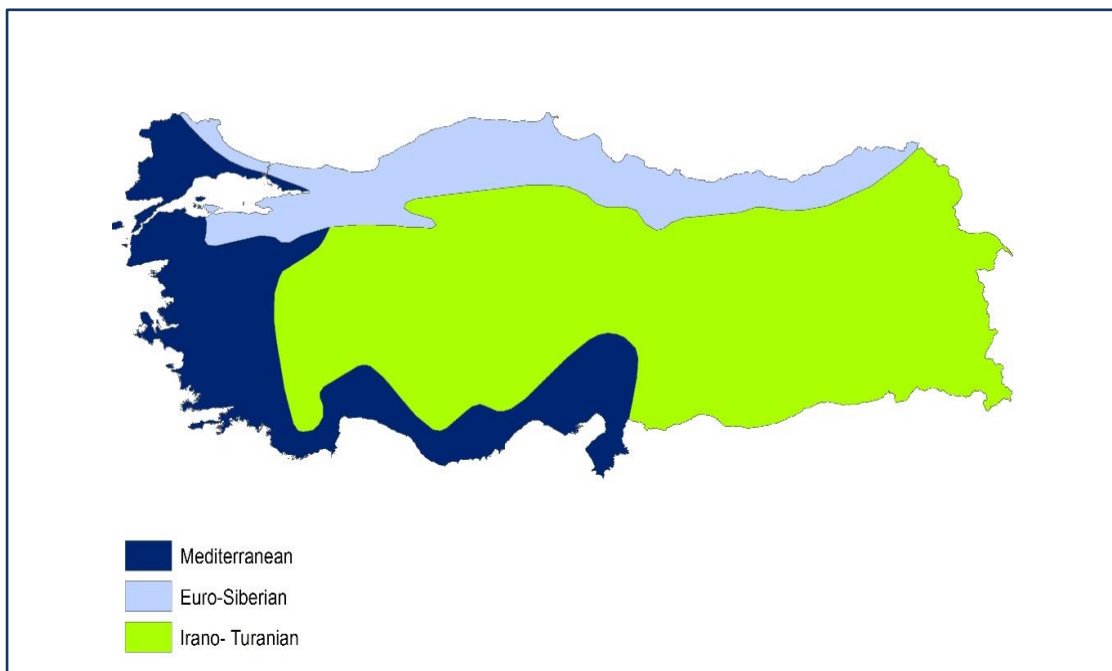


Figure 1. Phytogeographical regions present in Turkey (Source: Davis, 1965-1985).

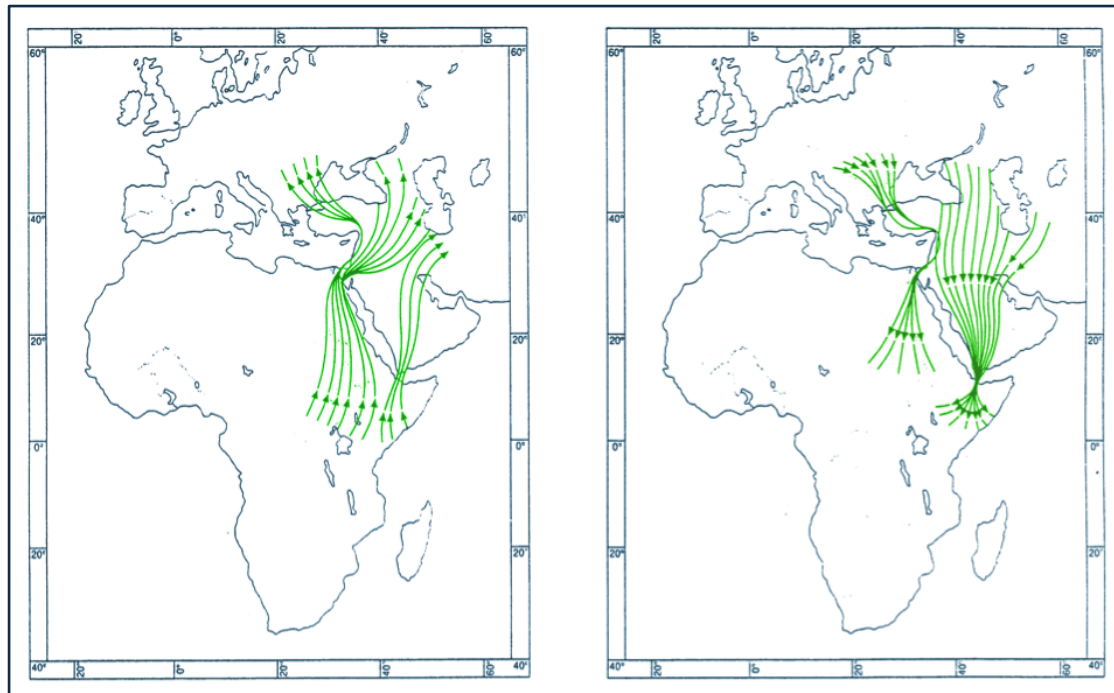


Figure 3. Map showing different bird migration routes passing through Turkey (Source: Yom-Tov, 1988).

Furthermore, the herpetofauna of Turkey is very rich in comparison to European countries; almost 130 reptile species and more than 30 amphibian species do occur in Turkey with a high rate of endemism (up to 20% for amphibian and up to 13% for reptile species). Finally, being surrounded by three seas, Turkey also hosts a high diversity of marine and coastal creatures, with up to 500 marine fish species present in the seas of the country (Fricke et al., 2007, Abdul Malak et al., 2011).

There exists 34 biodiversity hotspots identified in the world to represent sites hosting exceptional concentration of richness, exceptional concentrations of narrow endemics and also face exceptional degrees of threat (Mittermeier et al., 2004). Over 50% of the world's plant species and 42% of all terrestrial vertebrate species are endemic to these 34 hotspots. Other than South Africa and China, Turkey is the only country in the world, which hosts 3 hotspots in its territory. These hotspots are also identified in parallel to the phytogeographical regions of the country, namely the Mediterranean, Caucasus and Irano-Anatolian Hotspots (Fig. 4). Furthermore, 255 Important Bird Areas (IBA; Eken et al., 2006), 305 Key Biodiversity Areas (KBAs; Eken et al., 2006), 122 Important Plant Areas (IPAs; Özhatay et al., 2003) and 65 Prime Butterfly Areas (PBAs; Karaçetin et al., 2011) have so far been identified in Turkey reflecting the high biodiversity value of the country.

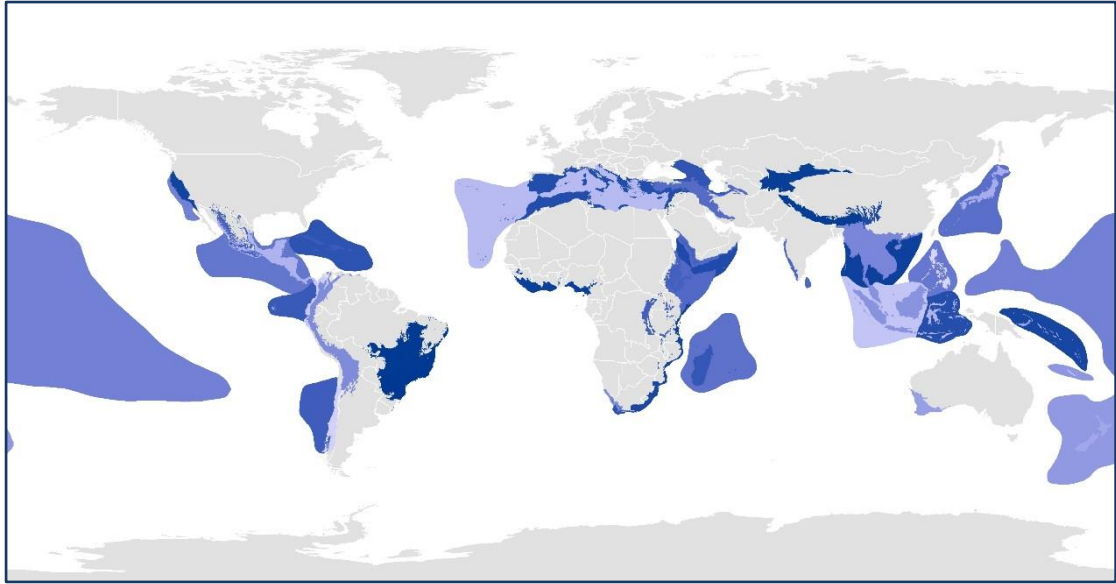


Figure 4. The 34 biodiversity hotspots identified in the world (Source: Conservation International; <http://www.conservation.org>).

Ecosystem Goods and Services

Ecosystem goods and services are benefits acquired by human societies from ecosystems. They are mainly classified as provisioning, regulating, and cultural services that directly affect people and supporting services needed to maintain the other services.

The ecosystem goods and services is a topic gaining prime importance in the world and many of the biodiversity protection, sustainable natural resource use studies and practices focus on how to assess and use the information on ecosystem goods and services effectively. Under the framework of Millennium Ecosystem Assessments (2005), the contribution of different ecosystem types to ecosystems goods and services have been discussed separately under marine systems, coastal systems, inland water systems, forest systems, dryland systems, island systems, mountain systems, polar systems, cultivated systems and urban systems. Under each section detailing different ecosystems in Turkey, we will present the ecosystem goods and services identified in this framework – at the global scale – by these assessments. Even if they are presented at the global scale, the goods and services identified for different ecosystem types do also represent the realities of Turkey and its ecosystems.

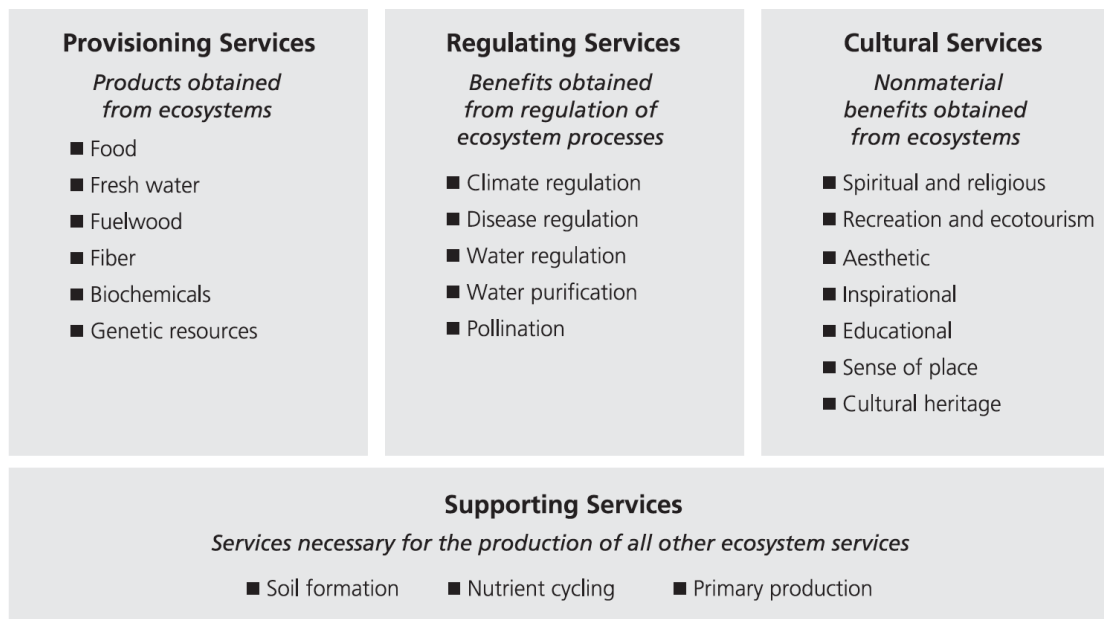


Figure 5. Provisioning, regulating, cultural and supporting ecosystem goods and services (Source: United Nations Environment Programme; www.unep.org).

Ecosystem Diversity of Turkey

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

Steppe and Agricultural Ecosystems

The Anatolian Peninsula, deserving the name “Asia Minor”, represents a miniature of central Asia in terms of its geography and biodiversity elements. Steppes in Anatolia, representing natural or semi-natural dry grasslands of temperate zone of Eurasia, deserves attention with diverse grassland communities, high plant species diversity and endemism rate, populations of globally threatened animal species in addition to housing wild relatives of crops and diverse land use practices as one of the birthplaces of agriculture. Unique conditions of abiotic factors (position at intersection of three continents and climatic zones, varied topography and geology) and anthropogenic factors as well as geological history contributed to the diversity in the Anatolian landscape, which in turn supports steppe diversity. In Turkey, steppes and grasslands - defined as areas covered with herbaceous plants - are currently covering about 21 million hectares (Fig. 6; Ambarlı et al., *in prep.*). Steppe ecosystems in Turkey can be divided into four major groups: Eastern Anatolian High Mountain Steppe, Central Anatolian Low Mountain Steppe, Central Anatolian Plain Steppe (mainly halophyte steppe) and South-Eastern Anatolian Dry Steppe. However these can be subdivided into many subgroups according to the parent rock, geomorphology, geographical distribution and dominant species. It is possible to identify hundreds of alliances of vegetation communities in diverse steppe ecosystems of Turkey.

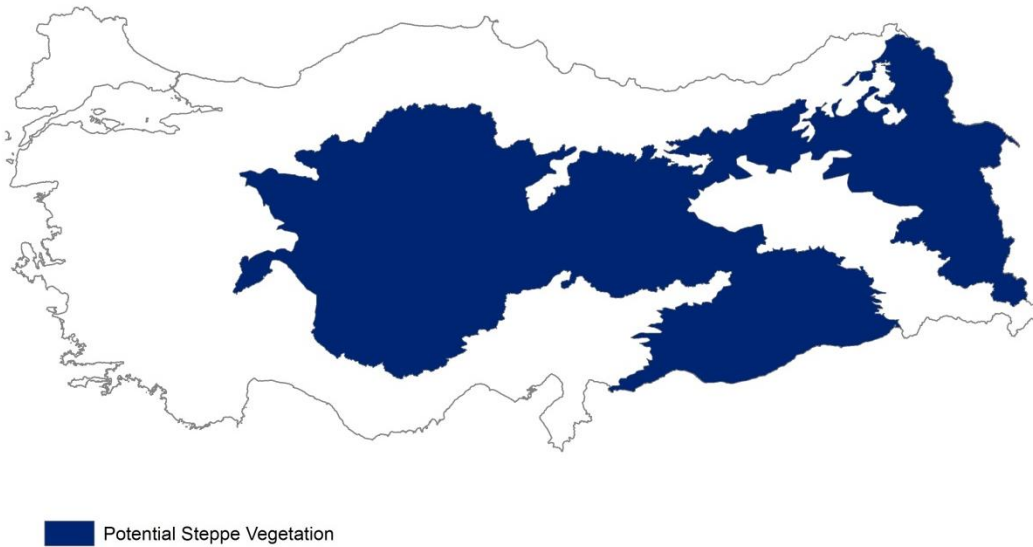


Figure 6. The potential steppe vegetation in Turkey (Source: Ambarlı et al. in prep.).

Many elements of Turkey’s globally important biodiversity are found in steppes and forest steppes of Anatolia, overlapping with territory of Irano-Anatolian Hotspot in Turkey (Mittermeier et al., 2004). Steppes of Turkey deserve attention with many endemic and threatened plant and butterfly species, and also populations of globally threatened birds, mammals and herptiles (Ambarlı et al., in prep).

Ecosystem Goods and Services Provided by Steppe and Agricultural Ecosystems

Under the Millennium Ecosystem Assessments, supporting, regulating, providing and cultural ecosystem goods and services have been identified for drylands in the world (Table 1; Safriel et al., 2005). The ecosystem goods and services provided by steppes and agricultural ecosystems of Turkey are in agreement with this classification.

Table 1. The ecosystem goods and services provided by drylands (Following Safriel et al., 2005)

Type	Good and Service
Supporting	Soil development: Formation and conservation
	Nutrient cycling
	Primary production
Regulating	Water regulation
	Climate regulation
	Pollination and seed dispersal
Provisioning	Food and fiber
	Fuelwood
	Freshwater provisioning
Cultural	Cultural landscapes and heritage values
	Spiritual services
	Aesthetic and inspirational services
	Recreation and tourism

Steppes in Anatolia are one of the birthplaces of agriculture in the world (Ambarlı, 2012). Agriculture has always been one of the major economic activities carried out in benefiting from these ecosystems. According to a recent study (Ambarlı et al., *in press*), more than >50% of steppe ecosystems in Turkey has been transformed to croplands. Since 1950s, through subventions given to agricultural mechanization, steppe ecosystems have been allocated majorly for agricultural practices (Kazgan, 2003). Also animal husbandry practices have increased in the same period causing drastic reduction in rangelands of Turkey (Redman and Hemmami, 2008). While in the past arable lands formed a mosaic of small plots with complex patterns of land ownership and tenure, surrounded by vast grasslands where livestock of the farms grazed (Redman and Hemmami, 2008), today conventional farming practices are being carried out in large surfaces and by bigger producers. Also, even though animal husbandry practices have declined nationally, they are still being carried out in steppe ecosystems (Kazgan, 2003). Thus, both agricultural and animal husbandry practices account for the major type of human practices carried out benefiting from steppe ecosystems.

Mountain Ecosystems

In Turkey, mountain systems are formed by folding, faulting and volcanism. The types of the mountain ecosystems vary according to phytogeographical regions, patterns of formation and the altitude. Given the high altitudinal changes in very small scales, mountain ecosystems in Turkey host diverse biological elements adapted to different climatic conditions. These mountainous ecosystems have vegetation covered by forests, woodlands, shrublands and grasslands depending on the altitude, geographical position, aspect, and climate type. Mountain ecosystems are rich in plant species and also in animal species. Taurus Mountains, Eastern Anatolian Mountains, Anti Taurus Mountains, Amanos Mountains and North Eastern Black Sea Mountains including Caucasus appear as globally important biodiversity hotspots (Fig. 7).

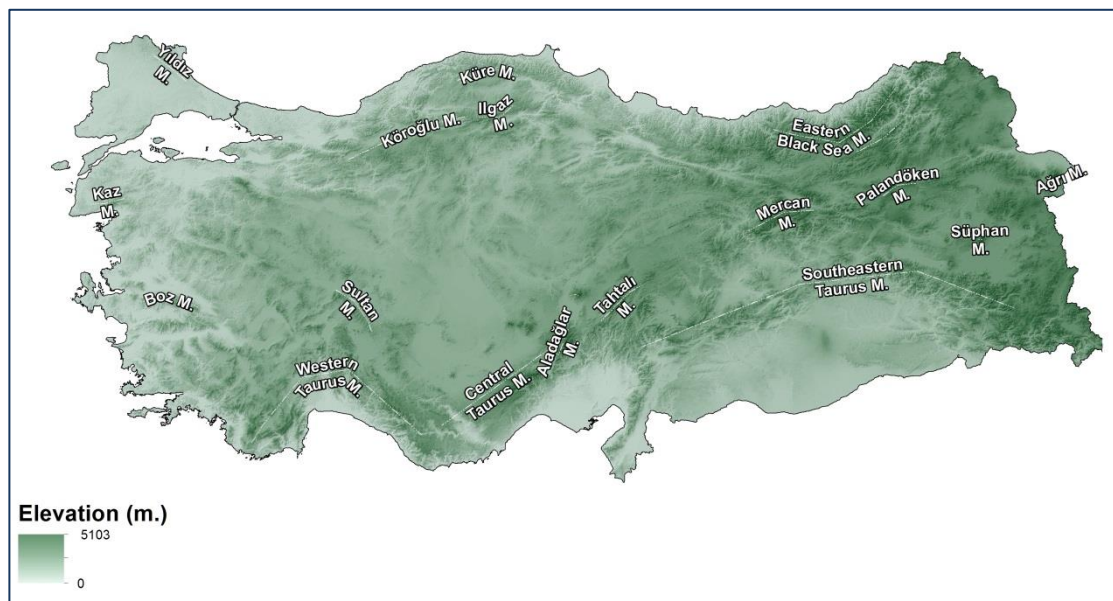


Figure 7. The elevation map of Turkey with major mountain ranges indicated (Source: Shuttle Radar Topography Mission (SRTM) Digital Elevation Database).

Ecosystem Goods and Services Provided by Mountain Ecosystems

From hills, plateaus to montane and alpine types, mountains provide provisioning, regulating, supporting and cultural ecosystem goods and services in the world. The ecosystem goods and services provided by mountain ecosystems are presented here following Körner et al., 2005 (Table 2).

Table 2. *The ecosystem goods and services provided by mountain ecosystems (Following Körner et al., 2005)*

Type	Good and Service
Provisioning services	Freshwater
	Timber
	Fuelwood
	Crops
	Biochemicals, natural medicines, pharmaceuticals
	Non- timber forest products
Regulating and supporting services	Biodiversity protection
	Water regulation
	Climate regulation
	Soil development: Formation and conservation
	Erosion control
	Natural hazard regulation
Cultural services	Spiritual and religious values
	Aesthetic values
	Recreation and ecotourism

In Turkey, among the above listed services; recreation (winter tourism and pastureland tourism) and ecotourism (in and outside the protected areas) and grazing are the main ecosystem goods and services provided by mountain ecosystems. 2014 official tourism statistics show that there were 4.8 million tourists in winter season (December, January and February), most of them visiting the 28 different ski centers registered by the Ministry of Culture and Tourism.

Animal husbandry is one of the main income sources for villagers in Turkey. Seasonal migration to higher elevations for the animal breeding (for grazing and fodder) is an important cultural practice in the eastern and northeastern regions of the country.

Forest Ecosystems

Forests are not only the union of trees but they also provide habitat for a wide range of animals, plants and mushrooms. Naturally old forests, which have disappeared in most regions of the world can still be found in Anatolia. Turkey is rich in terms of forests. Forest ecosystems in the country cover a total area of app. 21 million ha (Fig. 8). If forests are evaluated in term of the raw material obtained from each unit area, they may not seem so rich. However, without a doubt, Turkey can be considered very rich concerning the biological diversity of its forests. In terms of the species and structural diversity of its forests, Turkey can compete with much of the northern hemisphere. There are several reasons for this abundance. This can be explained in simple terms by the soil, water, air and mountains of Anatolia, and in scientific terms by the reflections of the main rock, diverse climate and

topography on biology. Rainfalls ranging from 500 millimeters to 3,500 millimeters, mountains that rise to 3,000 meters in the Taurus and draw humidity from the sea towards the inland or create an impenetrable barrier, play a role in this diversity. In fact these are the main factors, which determine the nature of the system from trees to insects, birds to mammals.

The forest ecosystems in Turkey show great difference in its structure, composition and processes; from west to east and from north to south. Forests ecosystems in the Taurus Mountains are diverse in terms of plant species richness. The Caucasus part has old growth forests; the Western Black Sea Region has forests with high woody species richness which makes peak around Yenice and Küre Mountains. Amanos Mountains are prominent with its Black Sea Forest enclave, Central and Eastern Anatolia has oak woodlands, which bears high number of oak species, high plant and butterfly diversity. The forest types observed in Turkey according to the phytogeographical regions are as follows:

Euro-Siberian Phytogeographical Region has deciduous forests (beech, chestnut, hornbeam) humid and semi-humid coniferous forests (black pine, Scotch pine, spruce, fir), dry oak and pine forests (oak, black pine, Turkish pine), shrublands (pseudo-maquis and oak-hornbeam) formation.

Mediterranean Phytogeographical Region is dominated by maquis and garigue formations (Kermes oak, sandal, gum, myrtle, laurel) in the lowlands, coastal and low-altitude areas are covered by Turkish pine forests, middle to high altitude (1,000-1,900 m) areas are covered by black pine, Taurus fir and cedar forests and juniper formations.

Irano-Turanian Phytogeographical Region has steppe woodlands dominated by oak and juniper species, Black pine forests in transition regions.

These rich forest ecosystems of Turkey provide habitats for a great number of endemic plant species, important bird species and other wildlife species.

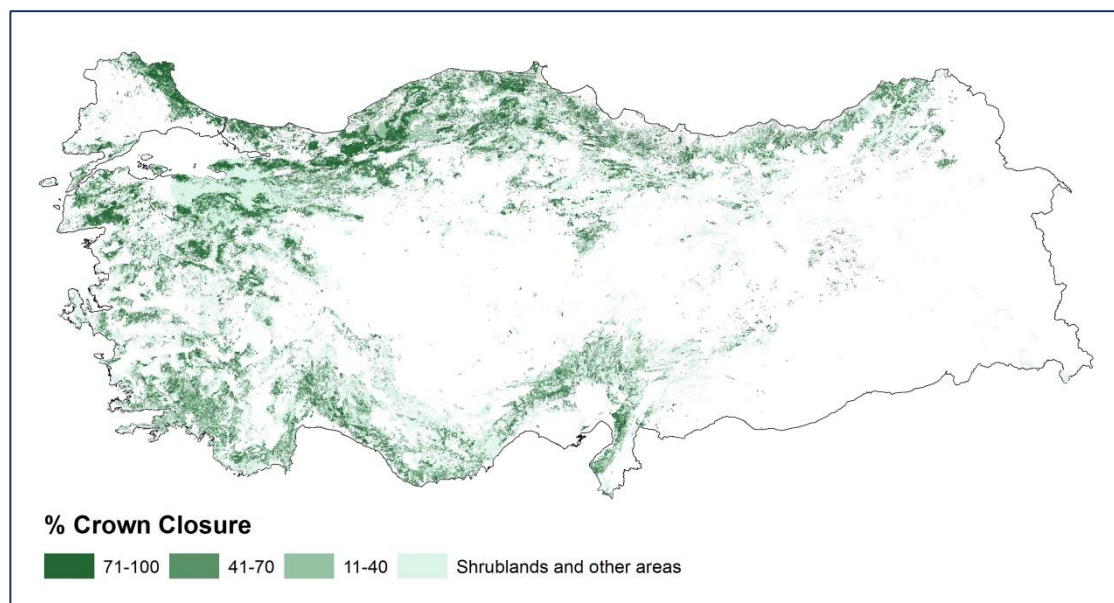


Figure 8. Map showing the distribution of forest ecosystems in Turkey, differentiating %crown closure (Source: General Directorate of Forestry 2010 Forest Cover Data).

Ecosystem Goods and Services Provided by Forest Ecosystems

Globally, forest ecosystems are acknowledged for their importance in terms of the ecosystem goods and services they provide. The ecosystem goods and services provided by forest ecosystems are presented here following Plan Bleu, 2014 (Table 3).

Table 3. *The ecosystem goods and services provided by forest ecosystems (Source: Plan Bleu, 2014)*

Type	Goods and Services
Resources	Industrial wood
	Fuelwood
	Cork
	Food products
	Fodder and forage
	Hunting and game products
	Pharmaceuticals, cosmetics and other raw materials for industrial application
Biospheric	Biodiversity protection
	Climate regulation
	Air quality regulation
	Carbon sequestration
Ecological	Health protection
	Water regulation
	Water purification
	Soil protection
Social	Recreation
	Tourism
Amenities	Spiritual and cultural services
	Historical and educational services
	Aesthetic services

Almost all Turkey's forests (more than 99%) are managed by Ministry of Forestry and Water Affairs General Directorate of Forestry (GDF). There are 21,584 forest villages with 7,346,297 people, who are mainly depending on forest ecosystem goods and services for living (industrial wood production, fuelwood production, non-timber forest products (NTFP), ecotourism, water production, etc.). GDF's 2014 annual report shows that there were 14,923,209 m³ industrial wood production and 5,257,994 ster (eq. of 0.75 m³) firewood production and the total income of GDF is 2,216,559,512 TL for these products. Non-timber forest products have been gaining more importance over the last decade. In 2013 171,297 tonnes and 52,522 units of non-timber forest products were harvested/produced and a total of 6,724,526 TL of income was generated. Main ecotourism activities (hiking and trekking, birdwatching, camping, photo-safari, rock climbing, flora and wildlife observation, canyoning, etc.) in Turkey are mostly carried out in and nearby forest areas (protected areas, city forests, and picnic sites). GDF and General Directorate of Nature Protection and National Parks develop ecotourism strategies and management plans for the sites under their responsibility, and implement activities at site level. Governmental institutions, NGOs and private sector's interest on ecosystem goods and services related to forest ecosystems have

significantly increased in the last decade, yet there exists no economic valuation carried out at the scale of Turkey.

In the framework of European Commission Programme on Environment in Developing Countries, Programme on Tropical Forests and other Forests in Developing Countries, the Kaçkar Mountains Sustainable Forest Use and Conservation Project had been realized in Turkey. In this project in 2009, economic valuation of local forests, in particular as regards to their functions and services, were carried out focused on the Yusufeli Region (southern part of the Kaçkar Mountains) located in the northeastern part of the country. As a result of this study, as of 2009 the ecosystem goods and services provided by the forest ecosystem was estimated as 3.5 billion TL/year (app. 1.2 billion USD/year; Başak, 2009). According to this study, the economic value of the goods and services of this forest, which covers only 0.2% of the surface area of the country, corresponded to 0.31% the Gross National Product (as of 2008). The biggest service in the forest was the soil erosion control service (annually 2.9 billion TL), followed by carbon sequestration (annually 792 million TL) and agricultural products (annually 292 million TL).

A more recent valuation study was carried out in the framework of World Bank's Turkey Environment and Natural Resources Technical Assistance (TA) Program entitled "Valuing Forest Products and Services in Turkey: A Pilot Study of Bolu Forest Area" (Erbaş et al., 2015). In the study, total economic value (TEV) of forests in Bolu region was estimated as 666.3 million USD as of 2013. The largest portion of the TEV was the indirect use values coming from ecosystem goods and services, including watershed protection, carbon sequestration and soil erosion control, which amounts to 341.4 million USD (50% of TEV). The second largest component of the TEV was the direct-use value composed of timber, firewood, non-timber forest products, honey, recreation, fodder for grazing and hunting. In terms of Gross Domestic Product (GDP), the known and accounted value (86.4 million USD) of forest products was about 0.5% of the regional GDP in 2013 while the total economic value of forest product and services was equivalent to 3.9% of the GDP.

With the support of Fond Français pour l'Environnement Mondial (FFEM), a Mediterranean regional project was carried out entitled "Optimizing the production of goods and services by Mediterranean forests in a context of global changes" jointly coordinated by Food and Agriculture Organization of the United Nations (FAO) committee on Mediterranean forestry issues — *Silva Mediterranea* and Plan Bleu. In Turkey the Düzlerçamı sub-district forest unit located inside the Antalya Regional Directorate of Forestry was chosen as the pilot site. The Ministry of Forestry and Water Affairs General Directorate of Forestry and Nature Conservation Centre (DKM) carried out the project to assess the economic value of priority ecosystem goods and services and also to carry out a cost-benefit analysis (CBA) towards the management alternatives on the site. As a result of the socio-economic valuation, the most important ecosystem good and service was identified as carbon sequestration (58 €/ha/year) given the presence of high forest coverage in the pilot site. The recreation and tourism service (18.73 €/ha/year), wood production (16.15 €/ha/year) and biodiversity protection (4.5 €/ha/year) were the other priority goods and services present in the site. Yet the outcomes of this approach should be seen as a minimum value for the biodiversity protection ecosystem good and service in the pilot site and more detailed assessments must be done to gain a better understanding of the biodiversity protection in the Düzlerçamı Pilot Site. The cost benefit analysis assessed the impact of opening a new recreation spot in the site and the overall impact of climate change. This project is among the rare studies where

the information on the ecosystem goods and services at a given site is used for developing effective management alternatives in Turkey.

Wetland Ecosystems

With its rivers and lakes covering an area of about 10,000 km², Turkey has very important wetland ecosystems. Among the wetlands present in the country, 135 have so far been identified as wetlands of international importance, of which 14 has been designated as Ramsar Sites (MoFWA figures; Fig. 9). Turkey has 7 drainage basins, including 26 river basins, and the ground waters are estimated at 94 billion m³, one third of which reaches water reserves and thus contributes to the maintenance of wetlands. Furthermore, Turkey hosts 9 rivers with more than 500 km in length (Kızılırmak, Fırat, Sakarya, Murat, Aras, Seyhan, Dicle, Yeşilirmak and Ceyhan) and many rivers which are trans-boundary. Deltas are of great importance for biological diversity, especially for waterbird species.

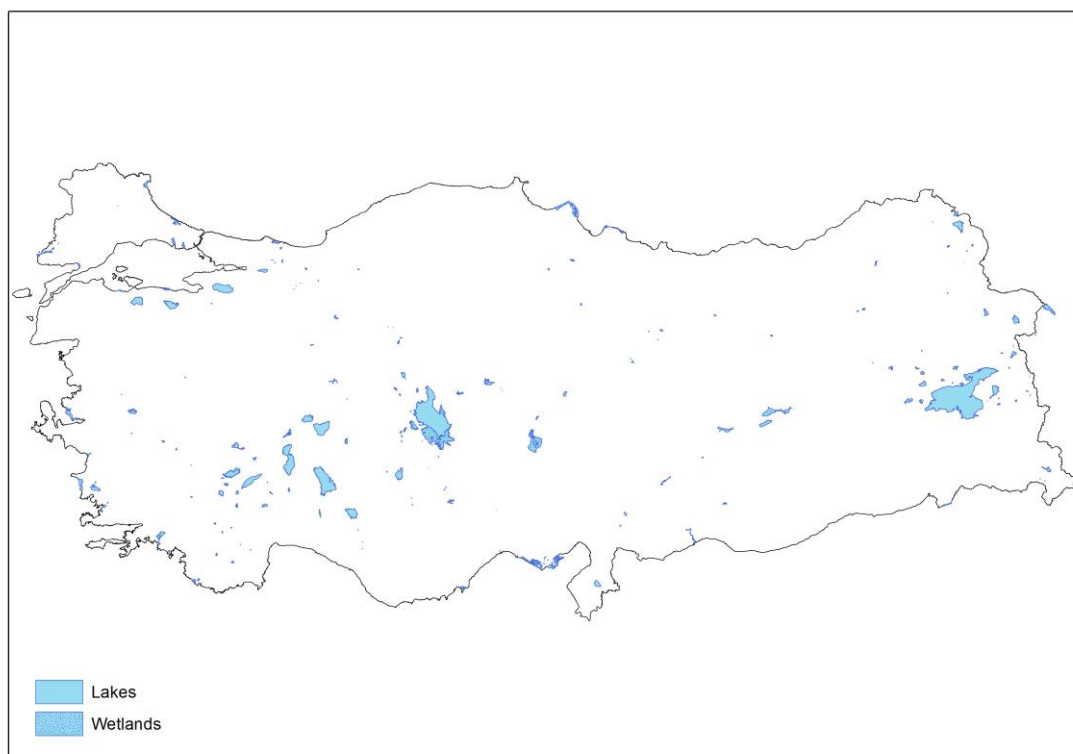


Figure 9. Map showing the wetlands and lakes present in Turkey (Source: State Hydraulics Work Data).

Ecosystem Goods and Services Provided by Wetland Ecosystems

In comparison to other ecosystems, limited information exists on the goods and services provided by wetlands. Under the framework of Millennium Ecosystem Assessments, the contribution of different type of inland waters, including wetlands have been identified at the global scale (Finlayson et al., 2005; Table 4).

Table 4. *The ecosystem goods and services provided by wetland ecosystems and their details (Following Finlayson et al., 2005)*

Type	Goods and Services	Comments and Examples
Provisioning	Food	Production of fish, hunting and game product, etc.
	Freshwater	Storage and retention of water for domestic, industrial, and agricultural use
	Fiber and fuel	Production of peat, fodder
	Genetic materials	Medicine, genes for resistance to plant pathogens, etc.
	Biodiversity	Species and gene pool
Regulating	Climate regulation	Greenhouse gases, temperature, precipitation and other climatic processes, chemical composition of the atmosphere
	Hydrological flows	Groundwater recharge and discharge, storage of water for agriculture or industry
	Pollution control and detoxification	Retention, recovery, and removal of excess nutrients and pollutants
	Erosion	Retention of soils
	Natural hazards	Flood control, storm protection
Cultural	Spiritual and inspirational	Personal feelings and well-being
	Recreational	Opportunities for recreational activities
	Aesthetic	Appreciation of natural features
	Educational	Opportunities for formal and informal education and training
Supporting	Soil formation	Sediment retention and accumulation of organic matter
	Nutrient cycling	Storage, recycling, processing, and acquisition of nutrients
	Pollination	Support for pollinators

Wetlands, underground and aboveground flows are the main suppliers of water to different sectors in Turkey. Agriculture accounts for 73% of the sectoral water use in Turkey, followed by domestic and industrial use (State Hydraulic Work statistics). Since 1950s, one of the main fields of use of wetlands has been irrigation and energy production through construction of big dams in Turkey. Following 1970s with the rapid increase of population and industrial development, the water infrastructure projects for drinking water and industrial use have also gained importance. Yet the inefficiency of irrigation methods (with >88% surface irrigation; Divrak et al., 2010), the heavy pressure on the ecosystems from dam and hydroelectric power plant constructions which are projected to increase further until 2023, and pollution from industrial use make the wetland ecosystems one of the most fragile ecosystems in Turkey. Other than agricultural, industrial and domestic use, wetlands – especially those of prime biodiversity importance like Ramsar areas – are being used for tourism and recreation purposes.

One of the pioneering works on economic valuation of ecosystem goods and services carried out in a wetland system in Turkey was on Tuz Lake Special Environmental Protection Area in 2003 (Başak, 2003). In this study, it was shown that the ecosystem goods and services in Tuz Lake generated 425 million USD annually. Grazing (182 million USD/year) and agriculture (168 million USD/year) were the most important goods and services provided by the lake followed by waste storage (55 million USD/year). A more recent study carried out with the support of the Ministry of Forestry and Water Affairs in 2012 did focus on the Sultansazlığı National Park (Turunç Peyzaj 2012). In this study a total of >1 billion TL was assessed as the economic value of different ecosystem goods and services provided by the wetland.

Coastal and Marine Ecosystems

Being surrounded by three seas of very different characteristics, Turkey has a significant marine and coastal diversity, hosting many rare species from different groups. The coastal ecosystems are very special ecosystems as they are important transition zones (ecotones) where marine and terrestrial ecosystems intersect. The coastal ecosystems form 4.1% of the terrestrial surface of the country. The different geomorphological formation of mountains in Anatolia has had a significant impact on the creation of coastal habitats such as dunes, caves, deltas, lagoons, salt marshes and calcareous terraces. Among all these coasts, particularly the coastal habitats in the Eastern Mediterranean Region are rich ecosystems with a high flora and fauna diversity.

The different characteristics of the seas surrounding Turkey, namely the Black Sea, the Marmara, the Aegean and the Mediterranean Sea, have also resulted in a rich biodiversity, hosting app. 500 marine fish species and other marine mammals, fungus/alga, high water plant species, invertebrates, etc. After the opening of the Suez Canal, many species belonging to the Indian-Pacific ecosystem area migrated from Red Sea to the Mediterranean via the canal and many of them adapted to the new ecosystem in the Turkish waters of the Mediterranean Sea, Aegean Sea, Sea of Marmara and the Black Sea respectively (Bilecenoglu, 2010).

Ecosystem Goods and Services Provided by Coastal and Marine Ecosystems

Under the framework of Millennium Ecosystem Assessments, the contribution of different type of coastal and marine ecosystems, whose contribution to human welfare is well known, have been identified at the global scale. Below, the goods and services identified at the global scale are presented separately for coastal and marine ecosystems (Tables 5 and 6; Agardy et al., 2005; Pauly et al., 2005).

Table 5. *The ecosystem goods and services provided by coastal ecosystems (Following Agardy et al., 2005)*

Type	Good and Services
Provisioning	Food
	Freshwater storage and retention
Supporting	Nutrient cycling
Regulating	Water regulation
	Climate regulation
	Disease regulation
	Natural hazard regulation
	Erosion regulation

Type	Good and Services
Cultural	Cultural and amenity
	Recreational
	Aesthetic

Table 6. *The ecosystem goods and services provided by marine ecosystems (Following Pauly et al., 2005)*

Type	Good and Services
Provisioning	Food
Supporting	Nutrient cycling
Regulating	Climate regulation
	Disease regulation
	Natural hazard regulation
Cultural	Cultural and amenity

In Turkey, food (fish and marine products, aquaculture) and recreation (tourism and ecotourism) are the main goods and services generating income for people. In Turkey, almost all of the villages by the sea have a tradition of fishing for their livelihood. 2014 official statistics show that 231,058 tons of different fish species, 35,019 individuals of marine species (other than fish) were caught and traded at the market. Additionally 235,133 tons of aquaculture products were produced in the fish-farms.

Turkey's official tourism statistics (2014) show that there were 41,415,070 tourists travelling in Turkey (67% are foreigners) and the total income was 34,305,904,000 USD. Nearly 20% of this income is by the coastal and sea tourism activities.

In the framework of the large scale GEF Project entitled "Strengthening Turkey's Marine and Coastal Protected Areas" (2009-2013), implemented by UNDP, a series of technical reports on economic analysis were prepared for 6 Protected Areas (Bann & Başak, 2011a, 2011b, 2013a, 2013b, 2013c, 2013d). The sites were: Foça Special Environmental Protection Area (SEPA), Gökova SEPA, Köyceğiz-Dalyan SEPA, Fethiye-Gökcek SEPA, Ayvalık Adaları Nature Park and Datça-Bozburun SEPA. In this project it was shown that the ecosystem goods and services in the Foça SEPA corresponded to around 37 million USD/year. This value incorporated provisioning services (fish), regulating services (carbon sequestration, erosion protection and waste treatment), and cultural services (tourism and recreation; Bann & Başak, 2011a). The economic value of Gökova SEPA was estimated at around 31.2 million USD/year and Ayvalık Adaları Nature Park as 43 million USD/year from provisioning services (fish and *salicornia*), regulating services (carbon sequestration, erosion protection and waste treatment), and cultural services (tourism and recreation; Bann & Başak, 2011b; 2013c). The total annual value of Fethiye-Gökcek SEPA was estimated as around 210 million USD/year, Köyceğiz-Dalyan SEPA at around 51 million USD/year and Datça-Bozburun SEPA at around 38 million USD/year from provisioning services (fish), regulating services (carbon sequestration, erosion protection and waste treatment), and cultural services (tourism and recreation; Bann & Başak, 2013a; 2013b; 2013d).

Threatened and Endangered Species

Despite the high biodiversity Turkey hosts, different types of human activities bring many species to the verge of extinction. There exists no national scale study to reflect this in

numbers, but there are some partial information generated from the red listing studies carried out on different species groups. Red lists are assessments towards identifying the extinction risks of species (or subspecies) using criteria identified by International Union for the Conservation of Nature (IUCN, 2012). A number of red list assessments have been carried out on different species groups in Turkey, however none of these studies have been approved at the national scale by the relevant governmental institutes yet. Therefore information presented here is not corresponding to all of the biodiversity elements of the country and needs to be updated (for groups other than butterflies whose assessment was carried out in 2011; Karaçetin and Welch, 2011).

Plants are among the species groups, with a high diversity at the national scale and which are facing serious threats due to human activities. According to the red list assessment, approximately 600 of endemic plant species are "Critically Endangered" (CR) and about 700 are "Endangered" (EN) (Ekim et al., 2000; Fig. 10). These numbers are expected to change through an on-going red list assessment study on plants at the national scale (Vural, M. *pers. comm.*).

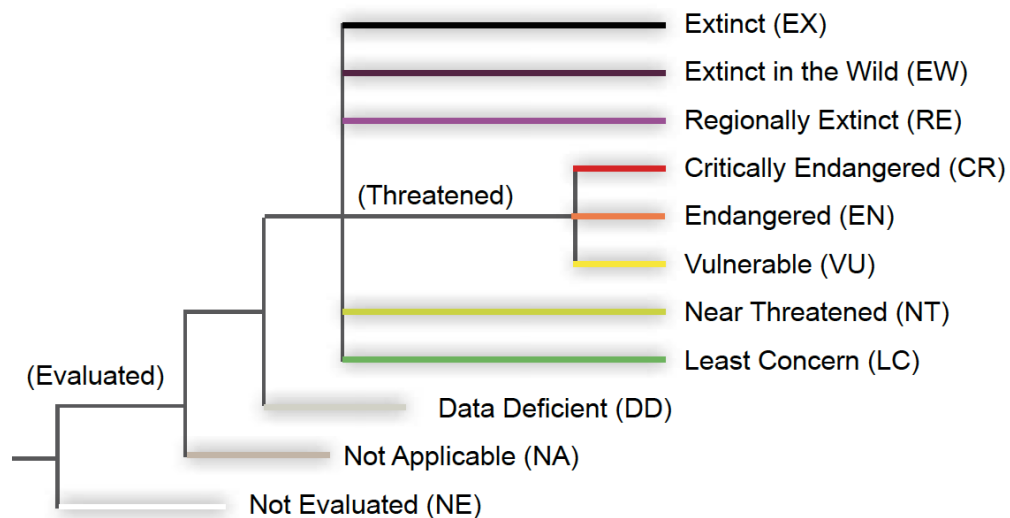


Figure 10. Red list categories (Source: IUCN Red List; iucnredlist.org).

Among the app. 480 bird species, none are endemics in the strict sense in Turkey, but more than 10 are threatened at the global scale (e.g. white-headed duck *Oxyura leucocephala*, imperial eagle *Aquila heliaca*, great bustard *Otis tarda*) and about one third of the species are threatened at national scale (Eken et al., 2006). Of the 385 butterfly species distributing in the country, 27 are threatened with extinction at national scale and 11 are near threatened (NT), corresponding in total to almost 10% of the species (Karaçetin and Welch, 2011). Of the 162 mammal species recorded in Turkey, some of which are protected under the Hunting Law regulations. The gazelle (*Gazella subgutturosa*), fallow deer (*Cervus dama*) and wild sheep (*Ovis orientalis*) naturally occurring in Turkey are among important mammal species in Turkey. In addition, species like striped hyena (*Hyena hyena*) and the Anatolian leopard (*Panthera pardus tulliana*) - once considered as extinct - still occur in the Southeastern and Eastern Anatolia. Finally, according to an assessment on the herpetofauna of Turkey, 17 of the amphibian species and 24 reptile species are threatened with extinction or near threatened at the national level (www.iucnredlist.org).

Genetic Diversity

Located at the intersection of the Mediterranean and Near-Eastern gene centers, the genetic diversity in Turkey (following Vavilov, centers of origin of cultivated plant), especially that of plant species is very important. Anatolia was a home for ancient agriculture where plants and animals have been raised for almost 30,000 years. The Southeastern Anatolia region, also called Northern Mesopotamia or “Fertile Crescent” is considered as the center of cultivation where mankind first started sedentary agriculture ten thousand years ago. For this reason, it is considered that many local animal races were first bred in this continent by early civilizations and spread to other regions of the world.

Being aware of the importance of agricultural plants, Ministry of Food, Agriculture and Livestock grows many species and varieties of each such plant under the Seed Production and Distribution Programme. 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. Through the "Turkish Endemic Plants Project", implemented with State Planning Organization 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 Food, Agriculture and Livestock.

Current Status of Threats and Trends

Exploitation of natural resources associated with human activities like agriculture, forestry and fisheries, as well as urbanization typically leads to disturbance and changes in the diversity of species and habitats. The greatest threats to biodiversity have occurred since 1950s, particularly in the past decade in Turkey. Although Turkey’s total forest area increased by 5.9% since 1973 due to intensive afforestation activities, old-growth forests, maquis, natural grasslands, coastal areas, wetlands, and rivers are deteriorating with an alarming rate, while overgrazing and rampant erosion degrade steppes and rangelands (Şekercioğlu et al., 2011). Climate change plays a major role, as well, with regard to adaptation capacity of natural ecosystems through resistance and resilience mechanisms.

Threats to steppes and agricultural ecosystems

In Turkey, most degradation and biodiversity loss occurs in lowlands and plain steppe ecosystems, connected with agricultural practices and partially urbanization and the other developments (e.g. public investments on transport, energy and industry). One of the major threats to Turkey’s biodiversity is caused by agricultural activities. Whether caused by the intensification of farming activities or due to land abandonment, it is important to understand the impact of the agricultural sector in order to develop necessary measures to achieve conservation objectives. The lack of comprehensive knowledge about the functions of agricultural ecosystems makes it difficult to achieve conservation and sustainability objectives. There are, for example, limited biological studies on the relationship between natural species and pollinators. Similarly, the studies on soil biota are insufficient. Almost half of Turkey’s land surface (53%) is used for crop and livestock production and 30% of its population lives in rural areas. Turkey is estimated to be the world’s 7th largest agricultural producer (Akkaraca Köse, 2012; Redman and Hemmami, 2008). It is important to emphasize here as well that Turkey’s agriculture is characterized by a large number of small-scale farmers (Öztürk, 2012), which in itself has partly a positive effect on biodiversity.

Awareness of the threats and benefits caused by agricultural activities are key to identify areas of cooperation with related governmental institutions either to halt losses of steppe biodiversity or to increase biodiversity benefits arising from specific agricultural activities, as there are many.

Other issues considerably impacting biodiversity in steppe ecosystems are intensive illegal collection of plant species with economic value, forestation of steppe areas with woody plant species and overgrazing.

Many of the local endemic plant species occurring in steppe ecosystems is listed as Critically Endangered (CR), the highest threat category given in IUCN (Ambarlı et al., *in prep.*). Also, according to Red Book of Turkey's Plants, majority of the threatened plant species are those distributing in steppe ecosystems. Although there are efforts towards identifying possible hotspots for nature conservation purposes, there exist limited systematic approaches, which can address such complex interactions between nature and human use.

Threats to forest ecosystems

Forests are among the well-studied and well-protected ecosystems of Turkey. Although Turkey's forests are more or less stable in terms of their coverage, it is difficult to locate a forest patch where no anthropogenic influence is present. Although, Ministry of Forestry and Water Affairs General Directorate of Forestry takes serious steps to protect the forest biodiversity, the amount of pristine and old growth forests is decreasing day by day.

Moreover, especially in the Mediterranean Region, forest ecosystems are expected to be drastically affected by the adverse effects of the climate change. These changes in forest ecosystems will undeniably have serious social, economic and environmental impacts (e.g. increases in pests and forest fires; Zeydanlı et al., 2010). Although Turkey has a highly professional GIS-based fire prevention and firefighting system, forest fires cannot be underestimated when listing factors that affect forest biodiversity. In addition, urbanization processes put further pressure on forest ecosystems and the expansion of industrial and urban areas into the mountain zones, which amongst others; result in increased air pollution (Çolak and Rotherdam, 2006). In the coastal zone of the country, forests and forest species additionally encounter threats due to land transformation related to intensified tourism sector.

Threats to mountain ecosystems

Mountain ecosystems are complex systems, which include forests, wetlands, wet meadows, and steppe ecosystems. On the other hand, the majority of the forests of Turkey exist in mountainous regions. Due to rural land abandonment, the tradition of mountain pastoralism (the 'Yayla' culture) is decreasing. As a part of this tradition, in spring and summer periods livestock herds are taken to high mountain pastures, where sheep and goats can be found grazing some of the steepest slopes, sometimes exceeding 60°. In general, this system of transhumance has a positive effect on biodiversity. Land abandonment and changes in land management have a negative effect on many species, e.g. butterfly species (Karaçetin et al., 2011). In some areas in Turkey, however, mountainous vegetation is also threatened by overgrazing and erosion, as well as by increasing tourism impacts. Increased construction pressure can, for instance, be observed due to mass tourism, especially at the highland pastures in Mediterranean Region, passing carrying capacity of these natural areas.

Threats to wetlands (inland and coastal waters) and aquatic ecosystems

Urbanization, dam construction, change in hydrological regime, draining of wetlands for agricultural purposes, poaching, and excessive irrigation can be listed as the most widespread threats to wetland ecosystems in Turkey. According to current plans, Turkey's rivers and streams will be dammed with almost 4,000 dams, diversions, and hydroelectric power plants for power, irrigation, and drinking water by 2023. Species and habitat types may additionally be affected by a reduced water retention capacity and increased flooding risks due to the destruction of wetlands.

It is expected that climate change will further impact these fragile ecosystems, e.g. due to decrease in precipitation, decrease in snow cover and increase in temperature. The expected increase in evapotranspiration because of climate change will result in the additional loss of inland wetlands, but also in increased saltwater intrusion in coastal zones. Saltwater intrusion is favored additionally due to reduced flows caused by upstream dam constructions.

The introduction of invasive exotic species into inland waters has resulted in irrecoverable damages to the native biodiversity in many water bodies in especially lakes since the 1950s. For example, the pikeperch species (*Sander lucioperca*) released into Lakes Beyşehir and Eğirdir has resulted in extinction of endemic fish species such as *Phoxinellus egridiri* and *Phoxinellus handlirschi* (Innal and Erk'akan, 2006).

It is very promising that Turkey is rapidly adopting the European Union's Water Framework Directive (WFD) into its legislation and starts implementing pilot projects (See Section 4 for examples) in major river basins such as Büyük Menderes, Konya Closed Basin, Susurluk Basin and Ergene Basins to address flow patterns, as well as agricultural and industrial pollution.

Threats to coastal and marine ecosystems

Many of Turkey's marine plant and animal species are severely threatened by habitat degradation and destruction, pollution, and over-exploitation (especially overfishing, FAO, 2009). Densely populated coasts experience large-scale habitat loss, disturbance, and pollution from rapidly increasing residential and tourism development especially in the Aegean and Mediterranean coastlines (Uras 2006, cited in UNDP Turkey, 2009). Especially, coastal sand dunes are sensitive ecosystems to these imminent threats. There exist 346,138 ha of marine area and 31 marine and coastal protected areas in Turkey (www.dka.gov.tr). Turkey protects 4% of its territorial waters (www.dka.gov.tr).



Figure 11. The distribution of marine and coastal Ramsar sites, Special Environmental Protected Areas and National Parks along the coastlines in Turkey, where different colors represent different type of protected areas.

A lack of a proper wastewater treatment infrastructure in major greater municipalities (Tekirdağ, Aydın, Mersin) along the coastlines of Turkey causes one of the most severe threats to the marine (and coastal) ecosystems.

Overfishing and illegal fishing are two important activities with a direct effect on target species and non-target species such as marine turtles. The endangered loggerhead sea turtle (*Caretta caretta*), a flagship species for nature conservation in Turkey, for example, is under further threat from fisheries by-catch (UNDP Turkey, 2009).

The Black Sea ecosystem, which is well-known for its high productivity and fish potential, intensively degraded due to excessive pollution coming from rivers draining in to the Black Sea from bordering countries for more than 30 years. Invasive alien species brought to the Black Sea from other seas by maritime transport became dominant in the ecosystem and changed the biological structure.

Areas Important for Biodiversity in Turkey

Studies towards identification of areas important for biodiversity in Turkey started in the 1980s. The preliminary studies focused on single taxa, mainly species groups which are better known and studied, such as birds and plants. These studies carried out at the national level did constitute the first practices of using objective criteria for selecting sites important for biodiversity conservation. The first study aimed at presenting the areas important for bird species in Turkey was the Important Bird Areas (IBAs). IBAs are determined by an internationally agreed set of criteria worldwide (identified by BirdLife International) such as presence of globally threatened bird species, of restricted range species, of biome restricted species and sites holding congregations of birds. In this framework Doğal Hayatı Koruma

Derneği (DHKD, Turkish Society for the Protection of Nature) and BirdLife International published the first book on IBAs (Ertan et al., 1989). DHKD (Yarar and Magnin, 1997) in 1997 and Doğa Derneği (Kılıç and Eken, 2004) revised the inventory of Important Bird Areas of Turkey. Finally in the framework of delineation of Key Biodiversity Areas, 255 IBAs were identified in Turkey (Eken et al., 2006; Fig. 12).

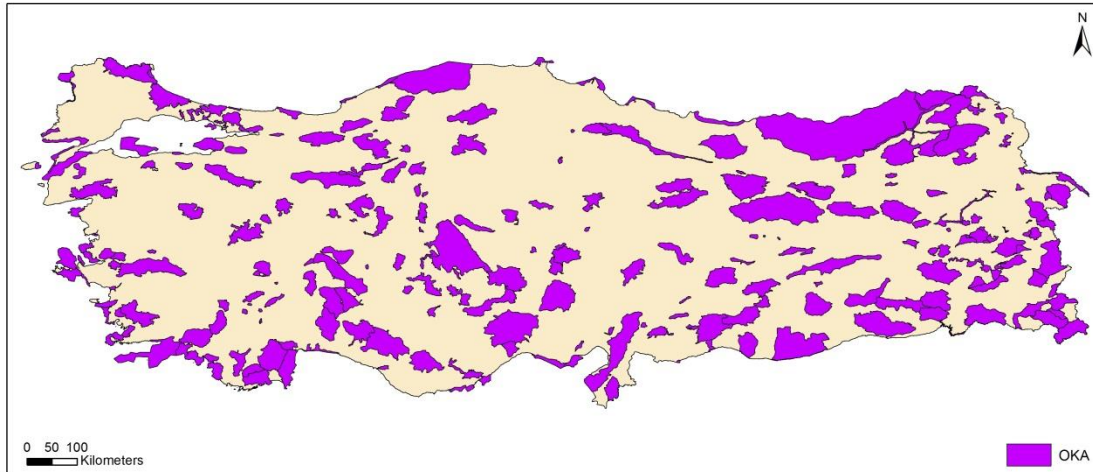


Figure 12. Important Bird Areas (IBA) identified in Turkey (Source: Eken et al., 2006).

Efforts towards to identification of areas richest for plant species led to the publication of the inventory of “Important Plant Areas of Turkey” by WWF-Turkey (Özhatay et al., 2003). Similar to IBAs, a set of criteria was employed to identify IPAs following the Plantlife International’s guidelines, such as presence of threatened plant species, of botanical richness and of threatened habitats. A total of 122 IPAs were identified in this framework in Turkey. A similar study targeting butterfly species was carried out to identify areas important for butterfly diversity, namely “Prime Butterfly Areas” (PBAs). Using Systematic Conservation Planning Approach (SCP), 65 PBAs were identified in Turkey (Karaçetin and Welch, 2011; Fig 13).

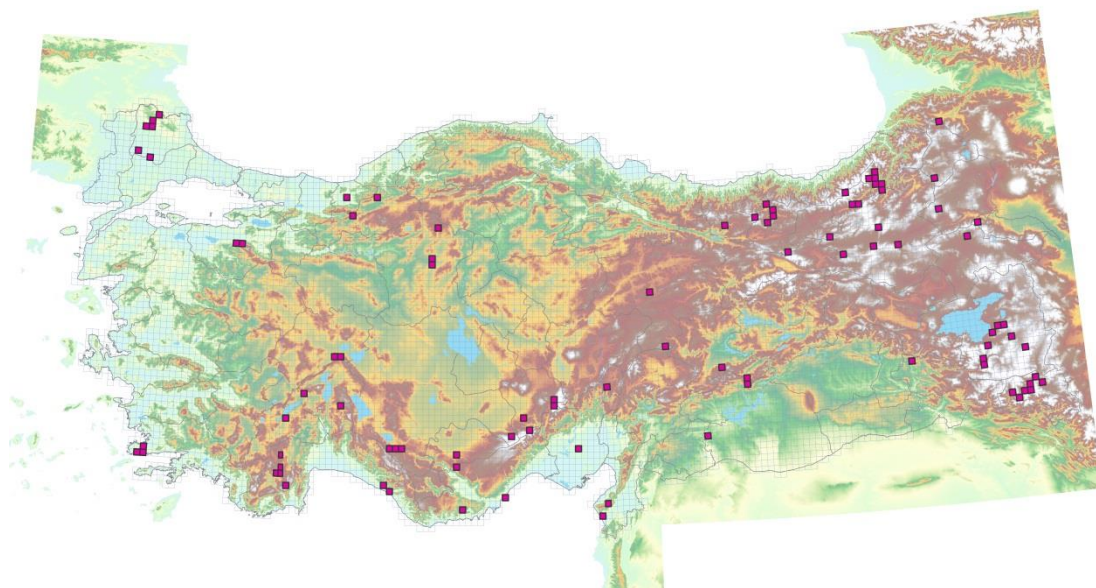


Figure 13. Prime Butterfly Areas (PBAs) identified using Systematic Conservation Planning (SCP) Approach in Turkey (Source: Nature Conservation Centre Geographic Information System (GIS) database).

All of these studies focused on single groups of species at the national level and constituted the first practices of using objective criteria for selecting sites important for biodiversity conservation. Studies not focusing on single species group but based on other approaches were also carried out in Turkey. One of these, the Systematic Conservation Planning (SCP) is a complementarity based approach used for delineating sites of conservation priority for multiple taxa through a multi-criteria optimization process (Margules and Pressey, 2000). The SCP studies have been carried out in 6 regions between 2000 and 2010 in Turkey covering nearly one third of Turkey, namely and priority conservation areas were identified: Mediterranean, Southeast Anatolia, Lesser Caucasus, Aegean, Anatolian Diagonal and Black Sea Regions (Fig. 14; Welch, 2004; Zeydanlı et al., 2005; Turak et al., 2011). The comprehensiveness of the evaluation process has been improved with each project through addition of new aspects related to persistence of biodiversity; developing new procedures for analyzing threats and socio-economic aspects, adapting some analyses to local conditions due to issues on legislation, cultural, socio-economic and political characteristics, data availability and/or quality, and other limitations. As a result, the Ministry of Forestry and Water Affairs has adopted the SCP approach for determining *Natura 2000* sites in Turkey. It is therefore of importance to finalize the regional SCP studies in the Eastern Anatolia, Central Anatolia and Thrace Regions. Institute for Pre-Accession Assistance (IPA) project entitled “Technical Assistance for Strengthening the National Nature Protection System for Implementation of *Natura 2000* Requirements” has been started as of 2015 in Turkey. In the framework of the project, methodological links between SCP approach and *Natura 2000* delineation system will be established and tested in Central Anatolia Region to identify potential *Natura 2000* sites in the region.

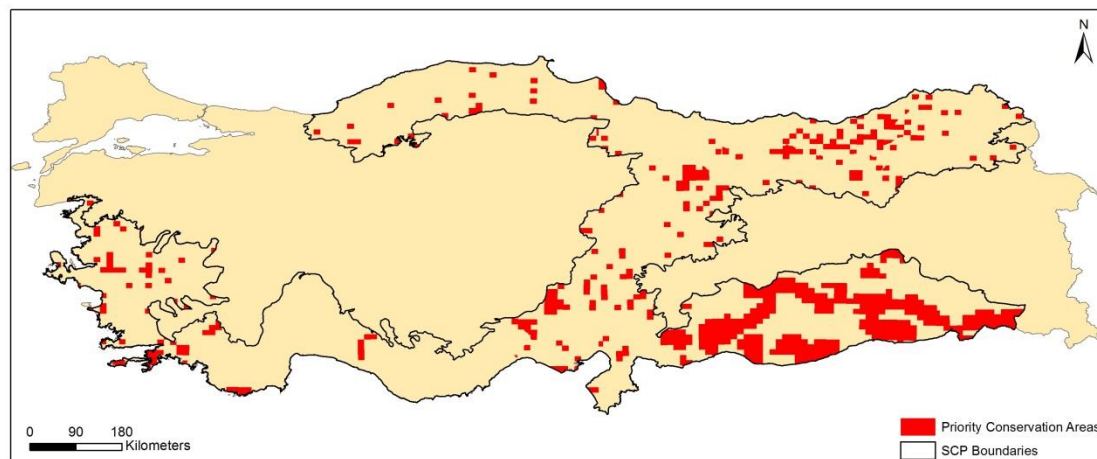


Figure 14. Priority Conservation Areas identified in the 6 regions under the framework of Systematic Conservation Planning studies in Turkey (Source: Nature Conservation Centre GIS Database).

A second example to studies not focusing on single species groups but based on other approaches is the “Key Biodiversity Areas” (KBA) conducted by Doğa Derneği (BirdLife in Turkey). This study was one of the most comprehensive studies carried out at the national scale on biodiversity. Many species groups (plants, birds, butterflies, reptiles, mammals, freshwater fish, and dragonflies) were evaluated in order to determine Turkey’s globally

important nature areas due to vulnerabilities and rarity, and as a result 305 Key Biodiversity Areas were delineated (Eken et al., 2006; Fig. 15).

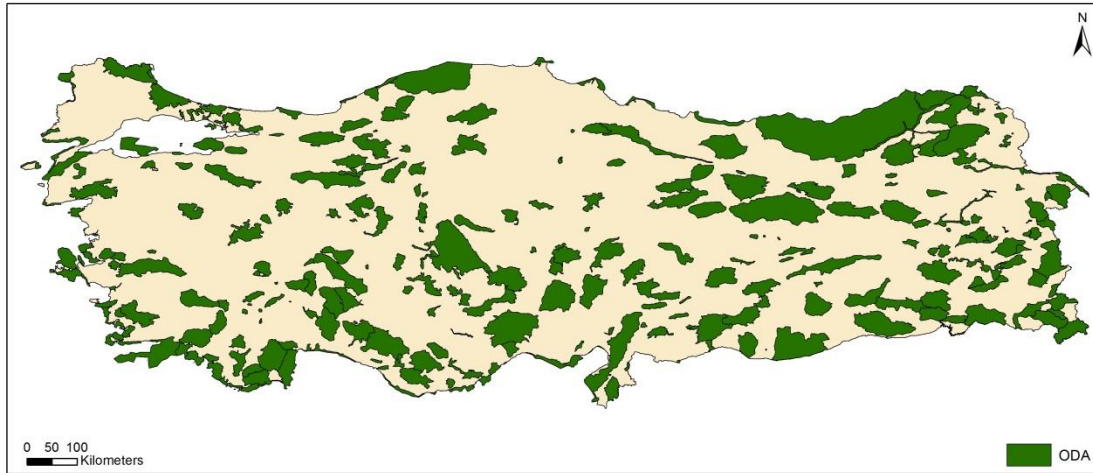


Figure 15. Key Biodiversity Areas identified in Turkey (Source: Eken et al., 2006).

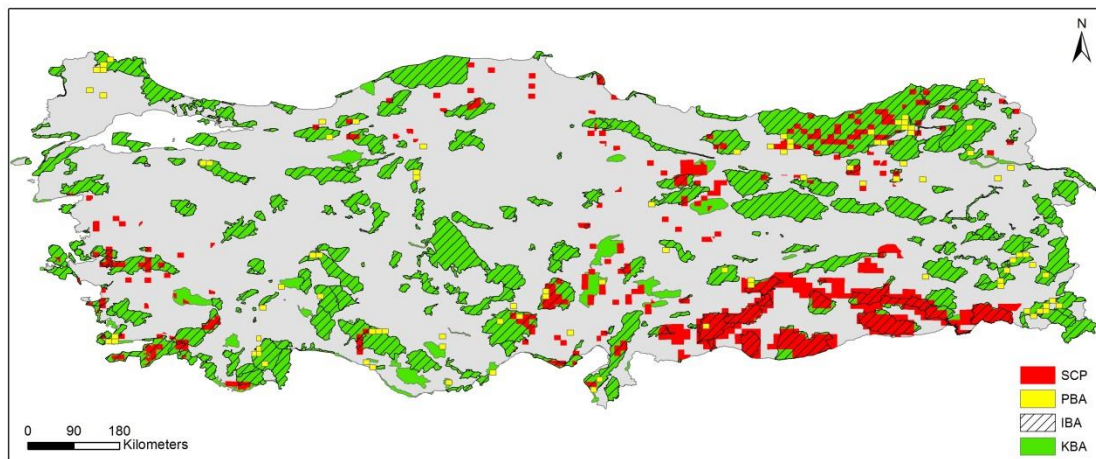


Figure 16. Areas important for biodiversity in Turkey (Source: Eken et al. 2006 and Nature Conservation Centre GIS Database).

The maps below show the population size at the level of districts overlapping with the areas important for biodiversity as identified under different approaches (KBA, PBA and SCP). As can be seen from the maps, there are areas which do overlap with districts holding high human populations in Turkey, which is indicative of the human pressures acting on these sites (Fig. 17). This type of data is informative for integrated land management studies, to identify sites with high human activities (and related human pressure) and holding important biodiversity elements. Furthermore, population movements are ongoing to big cities, especially along the coast as can be seen from Figure 18.

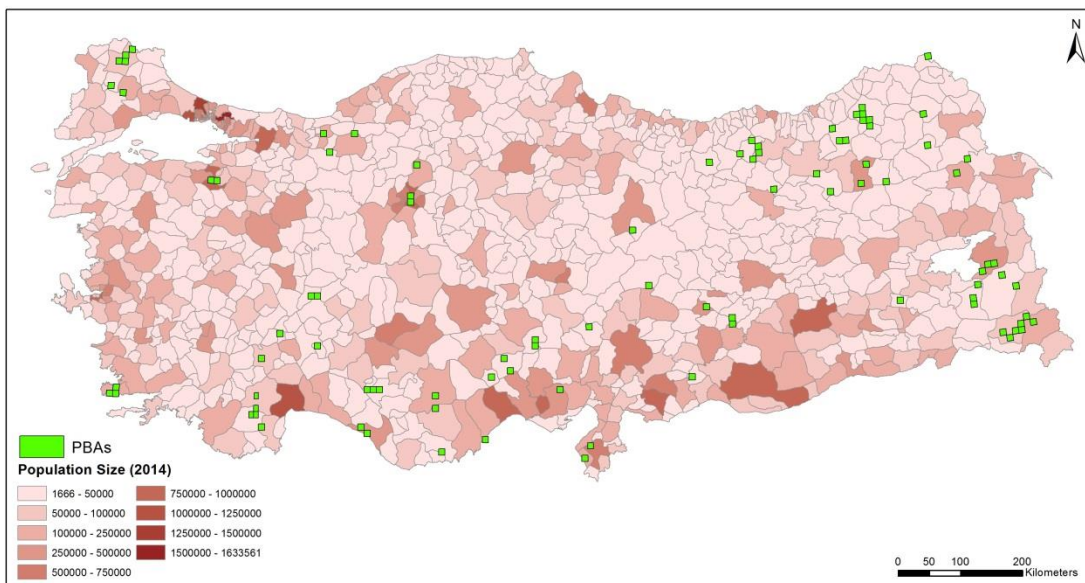
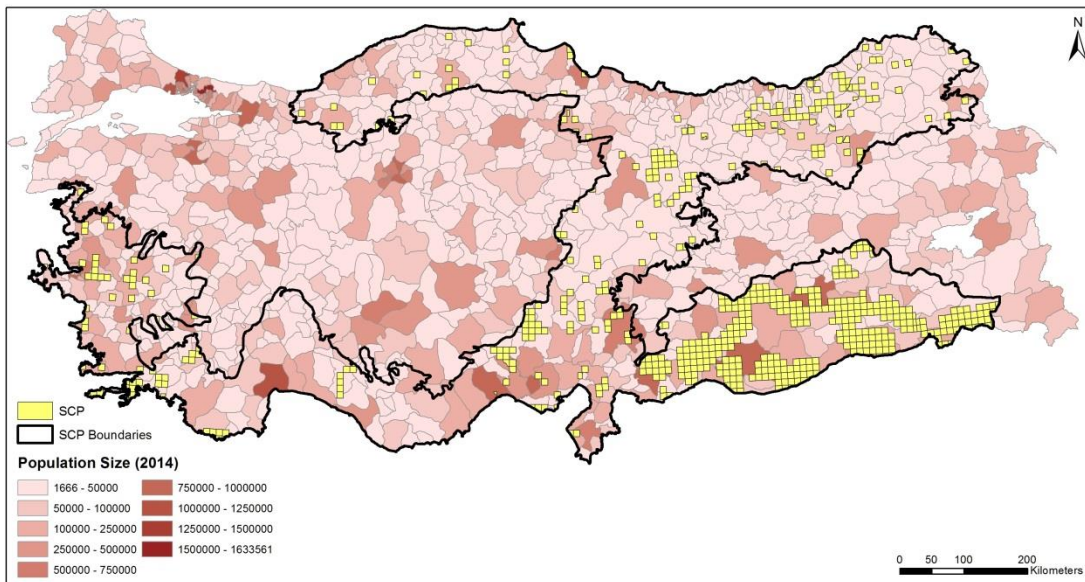
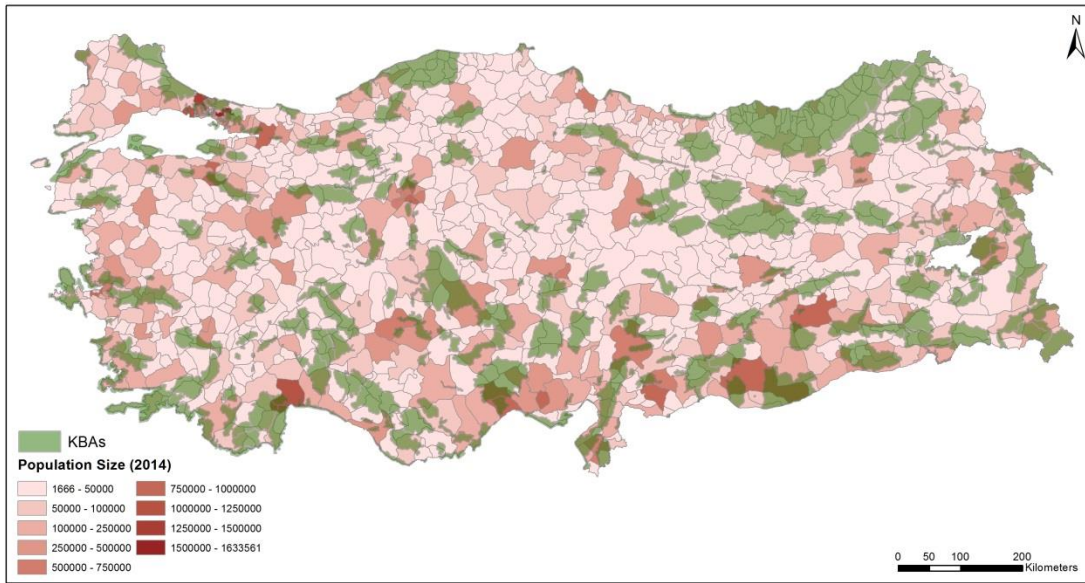


Figure 17. Maps showing areas important for biodiversity in relation to the population sizes of districts (as of 2014; Source: www.nufusu.com).

The topmost map shows Key Biodiversity Areas, the middle map shows Priority Conservation Areas identified in the framework of Systematic Conservation and the undermost map shows the Prime Butterfly Areas.

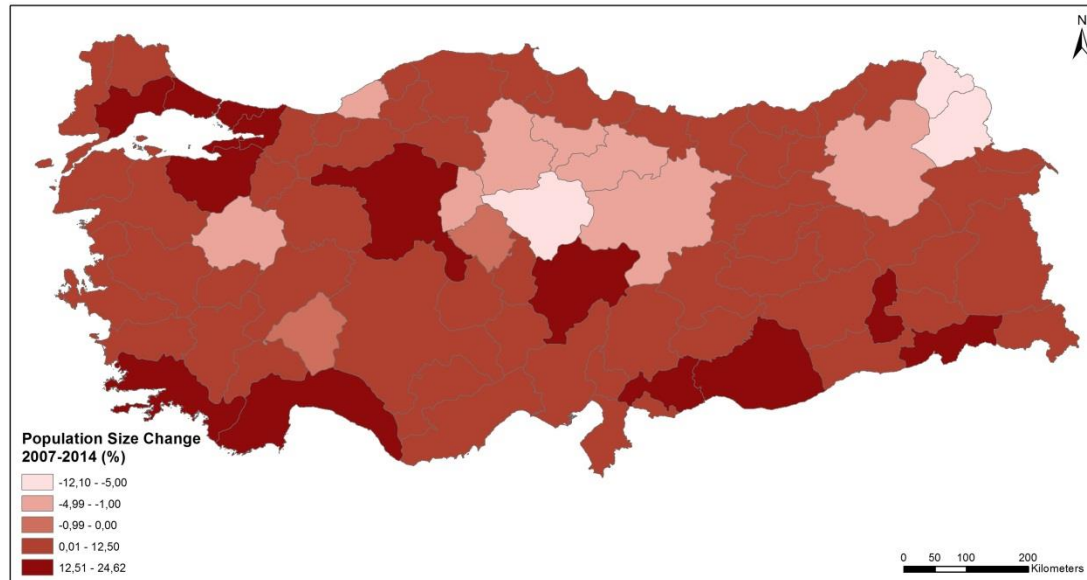


Figure 18. Map showing changes in population size in cities between 2007 and 2014 in Turkey (Source: Address Based Population Registration System (ABPRS), 2007-2014).

Conclusion About Overview of Biodiversity Areas in Turkey

Given the high diversity of ecosystems goods and the services Turkey host, it is difficult to conclude on the most important ecosystems at the national scale and the threats acting on them. One conclusion which can be made is regarding the national protected area network in Turkey; among all of the ecosystems present in Turkey, steppe ecosystems are the one which is the least presented in the legal protected area network in Turkey. Secondly, when taking into account the high importance given to energy production at the national scale, wetland ecosystems is one of the ecosystems which is prone to highest intensity of threats (with the construction of hydroelectric power plants and big dam projects). Yet, depending on the geographical region in concern, the intensity of threats acting on ecosystems and the goods and services they provide can differ.

There exists no national scale assessment on the goods and services provided by different ecosystems, therefore there is no conclusion driven from empirical data about which ecosystems play a more important role in terms of the goods and services they provide. Yet it can be concluded that at different geographical regions, certain ecosystems and their goods and services do provide a more critical role in the socio-economical dynamics. For example, in the Eastern Anatolian region, the fodder and forage service of the steppe ecosystems is very important. Similarly in the Mediterranean and Aegean regions the wetland ecosystems (for agricultural production) and coastal and marine ecosystems (for aquatic products) are the most essential.

2. BIODIVERSITY LEGAL FRAMEWORK:

Constitutional legislative background

Several Articles (Article 35, Article 44, Article 45, Article 56, Article 63 and Article 169) of the Constitution (1982) provides the necessary basis 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.

Article 63 of the Constitution indicates 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 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.

National Legislation

The National legal framework covers some fundamentals of nature protection policies and programmes:

The **Tenth Development Plan (2014-2018)** was designed as the basic strategy document that would contribute to the EU accession process and was approved by Turkish Grand National Assembly on 01.07.2013 in accordance with Law No. 3067. The Development Plan refers to the protection of natural resources, cultural assets and the environment considering future generations and foresees training and public awareness activities increase the environmental consciousness. Biodiversity is included in climate change and environment, urbanization, agriculture and food, and environmental protection sections.

The **National Program for Accession to EU (31.12. 2008 numbered 27097- 5.Bis)** is the official programme of the Turkish Government stipulating how the adoption of EU Acquis will be ensured and sets the priorities in each sector. As for the *Natura 2000* priorities, it foresees a review of the existing status of protected areas, carrying out biotope/habitat classification and mapping of protected areas and evaluation of potential *Natura 2000* areas, within the scope of improving the technical structure of biodiversity monitoring systems; establishment of a database system, determination of monitoring indicators and establishment of the institutional structure for monitoring and carrying out studies to examine all species and habitats within the scope of the Birds and Habitats Directives.

The **National Biodiversity Strategy and Action Plan (2007)**; Turkey has been a Party to the Convention on Biological Diversity since 1996. Turkey has submitted its 5th National Report in 2014 in accordance with the Convention with a view to define the required actions to reach the biological diversity targets in Turkey to the Secretariat of the Convention.

The **National Wetlands Strategy (2011-2015)**; approved by the National Wetlands Committee to ensure long-term conservation, carrying out inventories, monitoring, restoring, planning and wise use of resources of the Turkish wetlands and species. The

committee is made up of 10 members and operates under the secretariat of the Ministry of Forestry and Water Affairs General Directorate of Nature Protection and National Parks. With majority of members being experts from different ministries (Ministry of Forestry and Water Affairs, Ministry of Environment and Urbanization, Ministry of Food, Agriculture and Livestock and Ministry of Culture and Tourism), 2 members from academia and 2 from NGOs selected by the Ministry of Forestry and Water Affairs are invited to the committee. There are also Local Wetlands Committees established towards the wetlands of national importance.

The **National Environmental Integrated Approximation Strategy** (2007-2023); contains detailed information concerning the technical and institutional infrastructure to be developed as well as environmental improvements and arrangements to be carried out in Turkey in order to ensure alignment with the EU's Environmental Acquis and its effective implementation which all together constitute a precondition for accession to EU. In this regard, the strategy sets out objectives, targets, strategies and activities to be undertaken in Turkey in the priority areas including water, solid waste, air, industrial pollution control, nature protection and horizontal sector.

The **decree having the force of law on the Establishment of the Ministry of Forestry and Water Affairs** (Decree Law no. 644, 2011); sets the legal basis for the establishment of the Ministry of Forestry and Water Affairs, their competencies and duties in water resource management, forestry, meteorology, nature protection, management of protected areas and planning, monitoring and research.

The **decree having the force of law on the Establishment of the Ministry of Environment and Urbanization** (Decree Law no. 645, 2011); sets the legal basis for the establishment of Ministry of Environment and Urbanization, their competencies and duties in environmental policy making, environmental management, environmental inspection and permitting, urban planning and urbanization, approval of physical planning, nature protection especially on Natural Heritage Sites and Special Environmental Protection Areas, management of protected areas and planning, monitoring and research.

Law on **National Parks** (2873 - 09.08.1983); sets the rules for the designation of national parks, nature parks, natural monuments and nature conservation sites with national and international value to ensure their conservation, sustainable development and management without compromising from their ecological quality and characteristics. Technical details for the implementation of the Law have been introduced by the National Parks by-law.

Law for the **Protection of Cultural and Natural Assets** (2863 - 23.07.1983); stipulates definitions related to movable and immovable cultural and natural assets requiring conservation and regulates the actions and activities to be carried on a Natural Heritage Site. There are three categories of protection level from 1st Degree to 3rd Degree from most strict to less strict protection measures.

Decree-Law Establishing the **Special Environmental Protection Agency (SEPA)** (383 - 19.10.1989); establishes the required agency to protect environmentally special areas in Turkey (the Convention for the Protection of the Mediterranean Sea Against Pollution; Barcelona Convention). The law provides strong planning ability for the management of special areas and to take all measures for protecting the environmental assets of areas

designated or to be designated as 'Special Environmental Protection Area' and solving their existing environmental problems, to determine the principles of conservation objectives and regulate human activities. Special Environmental Protection Areas (SEPA) are declared by the Council of Ministers in accordance with this Law.

Terrestrial Hunting Law (4915- 01.07.2003); includes provisions for sustainable hunting and wildlife management within their natural habitats concerning the conservation and development of game hunting and wild animals together with their natural habitats for sustainable hunting and wildlife management. The law provides provisions to regulate and control of sustainable hunting taking into consideration of the economics of the hunting sector. Wildlife reserves and breeding stations are established in accordance with this Law. The 'By-law on Protecting Game and Wild Animals and Their Habitats and for Combating Their Pests based on the Hunting framework Law', which sets forth the procedures and principles concerning the conservation of game and wild animals, their habitats, relocations, introductions, measures of protection, hunting quotes, collection from the wild, transportation, management of predatory species and hunting methods. Furthermore, it regulates the wild animal capturing, trapping, scientific research, ringing, tagging, color marking and telemetric and other wireless monitoring. This Law does not cover fishing activities.

By-law on the Protection of Wetlands (17/5/2005 25818 Repealed on 4/04/2014, 2896); aims to implement the Convention on Wetlands of International Importance, especially as the Waterfowl Habitat (the Ramsar Convention) at national level. The By-law sets down the main principles for the protection and wise use of all wetlands, in cooperation with local and national stakeholders.

By-Law on EIA, Environmental Impact Assessment (25/11/2014 - 29186); stipulates that developers shall adopt all measures necessary to ensure that, before development consent is given, projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to a requirement for development consent and an assessment with regard to their effects on the environment

Law on Aquatic Products (1380-04.04.1971); 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 order to prevent pollution and harmful substances discharged from aquaculture farms into water bodies.

By-law on Protection and Enhancement of Trout and Cyprinids species habitats (12.01.2014, 2880); aims to identify and establish pollution prevention measures and monitoring methodology on natural water bodies where fish biodiversity is high.

By-law on the Protection of River Basins and Preparation of River Basin Management Plans (17.10.2012, 28444); aims to protect water resources at basin scale in line with the principles of the EU Water Framework Directive, which also requires to set up ecological objectives per each water bodies identified in the given river basin.

The Forest Law (6831-31.08.1956); sets the principles concerning forest management such as timber production planning, operation, and afforestation, protecting against illegal

logging and other activities, and creation of protection forests areas and protection of forests genes and seed.

By-law on **Propagation, Collection from Wild and Export of Bulbous Flowering Plants**; sets forth principles concerning the collection of ornamental bulbous flowering plants from wild, production under propagation and cultivation, storing and international trade of seeds, bulbs or other parts of natural bulbous plant without harming their natural population.

By-law on **Implementing the CITES Convention, Convention on International Trade in Endangered Species of Wild Fauna and Flora CITES**; sets the procedures and principles for the control of international trade in wild fauna and flora species covered by the CITES to ensure their sustainable use and protection at national and international level.

Pasture Law (4342-25.02.1998) and the Pasture Regulation; both put into force with the aim of ensuring the sustainable use of pastures during grazing periods, protecting the meadows and grazing areas in accordance with rules to be set, carrying out their management, maintenance and improvement, increasing and sustaining their productivity, continuously supervising their use and changing their purpose of use when required.

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 zones that are under their influence and an extension of them, considering their cultural and natural characteristics, and for their use for public benefit.

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 Ministry of Food, Agriculture and Livestock with the duty of conducting research for the conservation and development of biological diversity, genetic resources and ecosystems.

Soil Protection and Land Use Law (5403-03.07.2005); lays down procedures and principles to ensure the conservation and development of soil by preventing its loss and degradation through natural or artificial ways and planning the use of land in accordance with the principle of sustainable development giving priority to the environmental qualities.

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.

Organic Farming Law (5262-01.12.2004) and Regulation; was 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.

The **Regulation Concerning the Protection and Use of Agricultural Land**; 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 under CITES Convention. 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.

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

By-law on **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.

By-law on **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.

Table 7. National Laws / By Laws and the responsible governmental institutions for their implementation

Law/By Law Name	Responsible Governmental Institution
Law on National Parks	Ministry of Forestry and Water Affairs
Terrestrial Hunting Law	Ministry of Forestry and Water Affairs
By-law on the Protection of Wetlands	Ministry of Forestry and Water Affairs
By-law on Implementing the CITES Convention, Convention on International Trade in Endangered Species of Wild Fauna and Flora CITES	Ministry of Forestry and Water Affairs
The Law on National Mobilization for Afforestation and Erosion Control	Ministry of Forestry and Water Affairs
Law for the Protection of Cultural and Natural Assets	Ministry of Environment and Urbanization (for Natural Assets) Ministry of Culture and Tourism (for Cultural Assets)
Decree-Law Establishing the Special Environmental Protection Agency (SEPA)	Ministry of Environment and Urbanization
By-Law on EIA, Environmental Impact	Ministry of Environment and Urbanization

Law/By Law Name	Responsible Governmental Institution
Assessment	
The Coastal Law	Ministry of Environment and Urbanization
Law on Aquatic Products	Ministry of Food, Agriculture and Livestock
By-law on Propagation, Collection from Wild and Export of Bulbous Flowering Plants	Ministry of Food, Agriculture and Livestock
The Pasture Law	Ministry of Food, Agriculture and Livestock
The Agriculture Law	Ministry of Food, Agriculture and Livestock
The Soil Protection and Land Use Law	Ministry of Food, Agriculture and Livestock
The Organic Farming Law	Ministry of Food, Agriculture and Livestock
The Regulation Concerning the Protection and Use of Agricultural Land:	Ministry of Food, Agriculture and Livestock
By-law on the Collection, Protection and Utilization of Plant Genetic Resources	Ministry of Food, Agriculture and Livestock
By-law on the Protection of Animal Genetic Resources	Ministry of Food, Agriculture and Livestock
By-law on the Protection of River Basins and Preparation of River Basin Management Plans	Ministry of Forestry and Water Affairs

National Protected Areas System

In Turkey, protected areas are defined according to regulations and laws. The criteria to define protected areas are determined in National Parks Law, Terrestrial Hunting Law and Regulation on Wetland Management. Protected areas can be designated with the status of National Park, Strict Nature Reserve, Nature Park and Natural Monument under National Parks Law 2873. Many of the laws, strategies, action plans, signed international conventions, etc., in Turkey, have links with the European Union's legal tools for protection of biodiversity, i.e. the Birds and Habitats Directives. The selection of a site as a protected area is carried out following a mix of criteria, changing from suggestions from local authorities and stakeholders to the initiative of higher hierarchical levels. The decisions on selecting an area as a National Parks or Special Environmental Protection Area are taken by the board of ministers. The status of the protected areas are identified by the Ministry of Forestry and Water Affairs according to the characteristics of the site in concern following the National Parks Law 2873 and the regulation entitled Protected Areas Identification, Registration and Approval Related Procedure and Principles (dated 19 July 2012; published on Official Gazette no 28358 and updated on 19 February 2013 on Official Gazette no 28564).

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* conservation programmes such as National Parks, Nature Protection Areas, Nature Parks, Wildlife Reserves, Special Environmental Protection Areas, Natural Preservation Sites, Natural Monuments and Gene Conservation and Management Areas have been established gradually in Turkey since the 1950s. The total coverage of protected areas in Turkey is 7.24% (figure from the Ministry of Forestry and Water Affairs, 2015). However, there are different estimations about the percent coverage of the protected areas. One of the reasons behind the different estimates is the difference in the assessment of conservation management effectiveness of different protected area status both *de-jure* and *de-facto*. Brief information about the protected area statues in Turkey is given below (Table 8; Fig. 19).

Table 8. Protected area status and number in Turkey (Status Report on Nature Conservation (2002-2013), 2013¹, updated as of September 2015)

Conservation Status	Foundation Year	Responsible Governmental Institution*	Number
National Park	1958	MoFWA	40
Nature Park	1983	MoFWA	203
Strict Nature Reserve	1987	MoFWA	31
Natural Monument	1988	MoFWA	112
Wildlife Reserves	1966	MoFWA	81
Protected Forests	1950	MoFWA	58
Gene Conservation Forests	1994	MoFWA	245
Seed Stands	1969	MoFWA	628
Special Environmental Protection Areas	1988	MoEU	16
Ramsar Sites	1994	MoFWA	14
Natural Heritage Sites	1973	MoEU	2,134
Biosphere Reserve	2005	MoFWA	1
World Heritage Site	1985	MoCT, MoFWA, MoEU	15
Gene Conservation and Management Areas	1993	MoFWA / MoFAL	3

* MoFWA – Ministry of Forestry and Water Affairs; MoEU – Ministry of Environment and Urbanization; MoFAL – Ministry of Food, Agriculture and Livestock; MoCT– Ministry of Culture and Tourism.

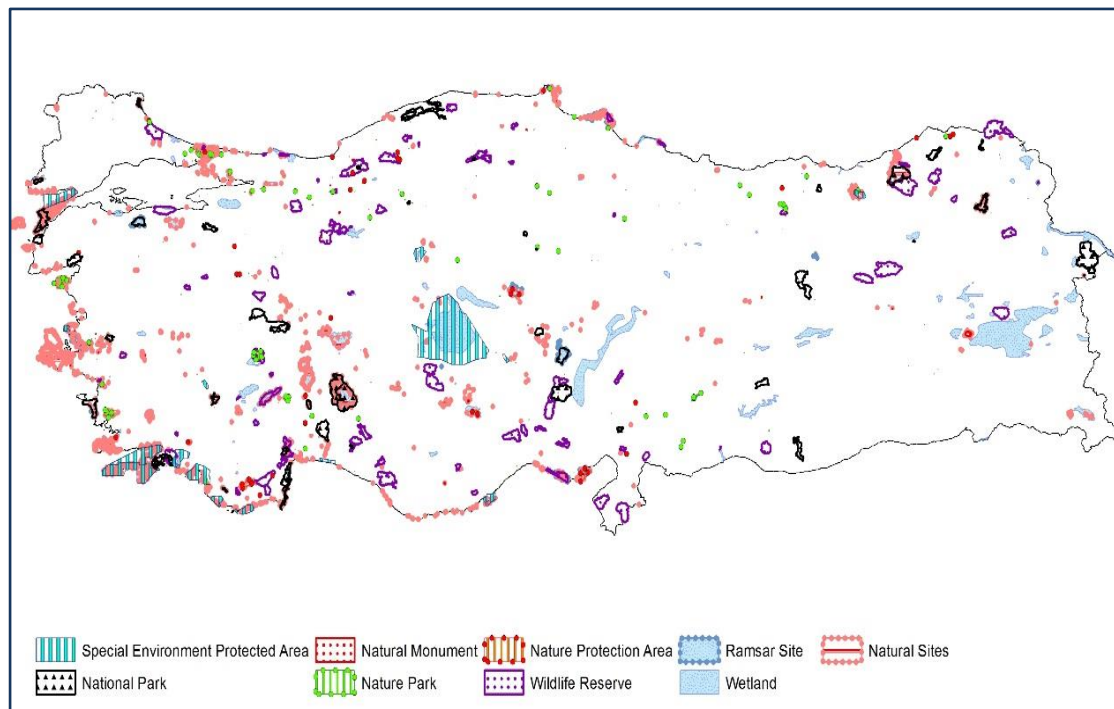


Figure 19. Distribution of protected areas according to their statuses (Source: Ministry of Forestry and Water Affairs data).

¹ Source: National Nature Conservation Report (2013) by the Ministry of Forestry and Water Affairs, General Directorate of Nature Protection and National Parks and updates based on <http://www.milliparklar.gov.tr/korunanalanlar/korunanalan1.htm>

National Park: It is defined as "an area with nature conservation, recreation and tourism values including rare natural and cultural values of national or international significance in scientific and aesthetical terms". It corresponds to IUCN Management Category II. There are 40 National Parks covering 828,614 hectares in Turkey. National Parks play an important role for the conservation of biological diversity in forest, steppe, wetland and coastal ecosystems in Turkey. The majority of the existing national parks are already well documented and planned in terms of their biodiversity and ecological features and human use. Many of them are potential candidates for Turkey's *Natura 2000* list.

Strict Nature Reserve: It is defined as "natural areas containing outstanding examples of rare, endangered or vulnerable ecosystems, species and natural phenomena having importance for science and education, which require strict conservation measures only allows research and educational activities. It corresponds to IUCN Management Category IIA. Most of these sites can also be candidates for future *Natura 2000* list of Turkey.

Nature Park: It is defined as natural areas that have a characteristic flora and fauna also suitable for combining recreational and ecological tourism activities considering the landscape integrity, with a national importance.

Natural Monument: It is defined as natural areas that contain special characteristics of nature or natural phenomena with scientific importance. They are similar to National Parks but much smaller in size. It corresponds to IUCN Management Category III.

Wildlife Reserve: In accordance with the Terrestrial Hunting Law 4915, areas holding the natural population of endangered wild animals are protected within Wildlife Reserves together with their habitats without degrading the characteristic of ecosystems. It corresponds to IUCN Management Category IV. Breeding programmes have been established for species such as wild sheep (*Ovis orientalis*) in Boz Dağ, Konya, the gazelle (*Gazella subgutturosa*) in Ceylanpınar, Urfa, and the bald ibis (*Geronticus eremita*) in Birecik, Urfa.

Protected Forest: The aim of the Protected Forests is to protect strategically important forest habitats with additional economic and social benefits such as to control of landslides and soil erosion, to provide clean air for urban areas and to provide additional national security. Furthermore, degraded production forests or damaged forests are also declared as Protected Forests during the recovery period.

Special Environmental Protection Area: Article 9 of the Environment Law stipulates that terrestrial or marine areas with high ecological importance on a national or global scale, which are threatened by environmental pollution and degradation can be designated as Special Environmental Protection Areas to guarantee their biological diversity and ecological qualities, including unique cultural values for future generations. These sites are formed within the framework of the Barcelona Convention and they are managed by Ministry of Environment and Urbanization. They correspond to IUCN Management Category V. Most of the Special Environmental Protection Areas are candidates for *Natura 2000* list of Turkey due to their high biodiversity and ecological qualities.

Ramsar Site: Turkey has ratified the Ramsar Convention in 1994 and designated 14 of its

internationally important wetlands as Ramsar sites. Lake Manyas, Lake Seyfe, Sultan Marshes, Kizören Carstic and Göksu Delta have been included in the list of Turkish Ramsar Sites. Following the recent assessment made by the authorities based on the Ramsar criteria, 135 wetlands of international importance have been identified. Management Plans for most of the enlisted sites have been finalized and being implemented.

Natural Heritage Sites The Natural Heritage Sites evolved under the competency of the Ministry of Culture back in 1973. The "Law for the Protection of Cultural and Natural Assets" was adopted in 1983 introducing the definition of "natural preservation" as well as the broad definition of "SIT", with caves, rock shelters, special trees and tree populations included. A recent study by the Ministry of Environment and Urbanization has revealed the presence of a total of 2,134 Natural Heritage Sites at the national scale, mostly overlapping with other protection statuses.

Seed Stands and Gene Conservation Forests: They are selected and managed for the in-situ conservation of their genetic diversity of a species. They aim to ensure the protection of genetically important species to secure the needs of future generations. They are under the responsibility of Ministry of Forestry and Water Affairs General Directorate of Forestry.

Biosphere Reserve: It is an area proposed by its residents, ratified by a national committee, and designated by UNESCO's Man and Biosphere (MAB) program, which demonstrates innovative approaches to living and working in harmony with nature. One of the primary objectives of MAB is to achieve a sustainable balance between the goals of conserving biological diversity, promoting economic development, and maintaining associated cultural values. The latest conservation status was given in 2005 for the Camilli region - located at the eastern Black Sea part of Turkey neighboring to Georgia - is based on the global criteria of the Biosphere Reserve.

World Heritage Site: Turkey holds total of 15 World Heritage Sites as part of the Global initiative. Göreme National Park and Cappadocia and Hierapolis- Pamukkale Special Environmental Protection Area fall under the mixed (cultural and natural) heritage category.

Gene Conservation and Management Area: The Gene Conservation and Management Areas concept was developed under the GEF-I funded "*In-Situ* Conservation of Turkey's Plant Genetic Diversity" project. The necessary institutional and administrative structure have been developed for the *in-situ* conservation of the gene resources of the wild relatives of agricultural plants including the declaration of pilot Gene Conservation and Management Areas. They are under the responsibility of Ministry of Forestry and Water Affairs General Directorate of Forestry.

International legal obligations

Turkey as of today has ratified to a number of international conventions, including:

- Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention),
- Convention on Biological Diversity (CBD),
- Cartagena Protocol on Biosafety to the Convention on Biological Diversity,
- Convention on the International Trade in Threatened Floral and Faunal Species (CITES, Washington Convention; detailed in the National Legislation Section of the report),
- Convention for the Protection of the Mediterranean Sea Against Pollution; Barcelona

Convention (detailed under the Decree-Law Establishing the Special Environmental Protection Agency (SEPA) in the National Legislation Section of the report),

- Convention on Wetlands (Ramsar Convention; detailed under the By-law on the Protection of Wetlands in the National Legislation Section of the report),
- Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention),
- European Landscape Convention,
- Council Decision 2008/157/EC of 18 February 2008 on the principles, priorities and conditions contained in the Accession Partnership with the Republic of Turkey and repealing Decision 2006/35/EC,
- United Nations Framework Convention on Climate Change, and the Kyoto Protocol,
- United Nations Convention to Combat Desertification,
- United Nations International Governmental Platform on Biodiversity and Ecosystem Services (IPBES).

The ratification of these conventions are important to bear in mind when implementing the European Union's Birds and Habitats Directives, since the work already done by Turkey to contribute to the Conventions can feed into meeting the *Natura 2000* requirements. Beneath, we give only brief details on the Convention on Biological Diversity, Bern Convention, IPBES and UNCCD being of particular relevance.

The United Nations Convention on Biological Diversity

Turkey has been a party to the Convention on Biological Diversity since 1996. Currently, there are 196 Parties to the Convention (as of 2015). Turkey has submitted its 5th National Report in 2014 to the Secretariat of the Convention.

Studies have been carried out with the coordination of the Ministry of Forestry and Water Affairs for the preparation of the "National Biological Diversity Strategy and Action Plan" (NBSAP), which was prepared in 2001 in accordance with the Convention and was revised in 2007 with a view to define the required actions to reach the biological diversity targets in Turkey. Yet, there is limited on the ground implementation of the strategy and the action.

Since 2004, Turkey has been Party to the Cartagena Protocol on Biosafety to the Convention on Biological Diversity, which was open for signature in 2000 and prepared to contribute to ensuring an adequate level of protection in the field of safe transfer, handling and use of living modified organisms resulting from modern biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity.

The Bern Convention

In 1984, Turkey has ratified the Bern Convention (1979, Council of Europe). The Convention is an international instrument in the field of nature conservation under the Council of Europe, covering most of the natural heritage of the European continent and extends to some States of Africa. It is the only regional Convention of its kind worldwide, and aims to conserve wild flora and fauna and their natural habitats, as well as to promote European co-operation in this field. Some of the important marine turtle and Mediterranean Monk seal (*Monachus monachus*) breeding coastlines have been declared as Special Environmental Protection Areas as part of Turkey's commitment to the Bern Convention.

The Bern Convention is not a legally binding instrument for the signatory countries, but a so-called “soft law”, which is a difference from the European Union’s Birds and Habitats Directives. For EU Member States, the Birds and Habitats Directives are legally binding and their articles must be transposed into national legislation and their adoption and implementation is obligatory.

Under the Bern Convention, the signatory countries are asked to identify a network of sites to become part of the Emerald Network. The lists of species and habitat types for which the sites are asked to be identified under the Emerald network are largely identical with the lists of species and habitat types in the Annexes of the Birds and Habitats Directives.

United Nations International Governmental Platform on Biodiversity and Ecosystem Services (IPBES)

Established in 2012, IPBES is an independent intergovernmental body opened to all member countries of the United Nations. It is established for assessing the state of the planet's biodiversity, its ecosystems and the essential services they provide to society.

IPBES provides a mechanism recognized by both the scientific and policy communities to synthesize, review, assess and critically evaluate relevant information and knowledge generated worldwide by governments, academia, scientific organizations, non-governmental organizations and indigenous communities. It aims at strengthening the capacity for the effective use of science in decision-making at all levels. At the level of the Ministry of Forestry and Water Affairs, Turkey is involved in the IPBES procedure.

United Nations Convention to Combat Desertification (UNCCD)

Turkey became a part of the United Nations Convention to Combat Desertification in 1997. The objectives of the convention are to combat desertification and mitigate the effects of drought with a view to contributing to the achievement of sustainable development in affected areas. The objectives are to be met through effective action at all levels, supported by international cooperation.

Turkey is involved in the Regional Implementation Annex for the Northern Mediterranean (Annex IV) of the Convention. Turkey has been attaching great importance to working in close cooperation with the countries in the region and to participating in programs and projects. The first national action plan of Turkey on combatting desertification was prepared in 2005 and a national coordination unit was established under the Ministry of Forestry and Water Affairs with the participation of experts from relevant institutions and NGOs. Turkey hosted the 12th session of the Conference of the Parties (COP) of the convention in Ankara in October 2015.

On the way to EU membership

The Helsinki European Council (December 1999) decided to recognize Turkey as an applicant for accession on the basis of criteria equivalent to those applied to the other applicant countries. The accession negotiations were started on 3 October 2005 and negotiations on Chapter 27 on Environment and Climate Change was opened in December 2009. With a view to achieving the objectives identified in the Accession Partnership, Turkey adopted a national programme for transposing the Community acquis (NPAA), in which it sets out procedures and a programme for implementing action in the priority areas.

During the early days of accession negotiations with the European Commission, European Union (EU) nature conservation legislations such as the Birds and Habitats Directives and eventually the *Natura 2000* protected area network has become an important topic for Turkey. Although Turkey is not yet a member to the EU, due to on-going accession negotiations and agreed closing benchmarks require Turkey to take the necessary preparatory work to be able to prepare a list of possible *Natura 2000* protected areas by the time of accession. Such an obligation however, may positively contribute to Turkey's effort to establish more systematic approach for designation and or reviewing the existing protected areas. Supporting this process, a new IPA project started in this framework entitled "Technical Assistance for Strengthening the National Nature Protection System for Implementation of *Natura 2000* Requirements" in Turkey in 2015.

European Union Biodiversity Strategy to 2020 and Progress of Turkey in the Environmental Sector

The European Commission has adopted a new strategy to halt the loss of biodiversity and ecosystem services in the EU by 2020 and has identified six main targets:

- Full implementation of EU nature legislation to protect biodiversity,
- Better protection for ecosystems, and more use of green infrastructure,
- More sustainable agriculture and forestry,
- Better management of fish stocks,
- Tighter controls on invasive alien species,
- A bigger EU contribution to averting global biodiversity loss.

These targets are in agreement with the strategic goals and targets of Aichi Biodiversity Targets identified under the Convention on Biological Diversity in the framework of the Strategic Plan for Biodiversity (covering 2011-2020). Overall at the European scale and among the members of the Convention on Biological Diversity, the need to take ambitious actions to halt biodiversity loss is acknowledged vis-a-vis the current threats acting on biodiversity and natural resources. Yet the progress of Turkey on the progress made in environment and climate change topics have been criticized in the EU Regular Report as;

*"Turkey has made some progress in aligning legislation in the fields of environment and climate change, whereas enforcement remains weak. While a stronger political commitment and re-establishment of regular policy dialogue on environment and climate change would help accelerating the alignment with and implementation of the acquis, the real challenge remains to conciliate growth and environmental concerns. **More ambitious and better-coordinated environment and climate policies still need to be established and implemented.** Changes to legislation on Environmental Impact Assessments and nature protection raise serious concerns. Strategic planning, substantial investments and stronger administrative capacity are required. The country needs to put forward by the first quarter of 2015 its intended contribution to the 2015 Climate Agreement. Cooperation with civil society and other stakeholders needs to be strengthened. Preparations in the areas of environment and climate change are still at an early stage".*

Furthermore the EU Regular Report on Turkey 2014 describes the state of play in the field of Nature Protection as;

*"Framework legislation on nature protection, **the national biodiversity strategy and action plan still have to be adopted.** The draft Nature Protection Law is not in line with the EU*

acquis. If adopted without implementing legislation, the law would repeal the National Parks Law, causing a legal vacuum. The potential Natura 2000 sites have not yet been identified. Turkey has adopted a series of laws allowing investments in wetlands, forests and Natural Heritage Sites, which is not in line with the acquis.”

Conclusion About Biodiversity Legal Framework

Turkey has obligations under various international conventions, agreements, and protocols for nature conservation and sustainable natural resource management. These obligations are met by different governmental institutions via different legislations. Although there are some gaps in the administrative and legislative structures, it appears that Turkey has the necessary experience, knowledge, human resources and infrastructure to develop effective nature conservation and protected areas networks.

The National Biodiversity Strategy and Action Plan identifies the need to expand the nature protection system to 10%, however, this target has not been reached yet. Furthermore, this percentage is rather low in comparison to the *Natura 2000* protected areas network representing 18% of the area of 27 Member States of the European Union (Gruber et al., 2012). There are various studies carried out mainly by NGOs in identifying and prioritizing sites in Turkey, which have included official involvement from government institutions, but none have yet been officially adopted into national protected areas system. All these studies point to the fact that the current coverage of protected areas is inadequate. There is thus a need for a comprehensive protected area network planning to be carried out and implemented in Turkey.

The last re-organization of the competent institutions and eventual establishment of two new separate ministries (Ministry of Forestry and Water Affairs / Ministry of Environment and Urbanization) in 2011 seem to cause significant impact on protected area registration and management planning approval process in Turkey. The overlapping duties and tasks create coordination problems for effective nature protection and law enforcement.

Linked to the recent institutional restructuring, the need for a re-assessment of the existing national protected area status has become challenging task for both ministries. The draft framework law on Biodiversity and Nature Protection may play a key role to overcome this challenge and for further alignment of Turkish legislation with the EU. However, according to the EU progress report (2014) the draft law needs some further revisions to be in compliance with the EU requirements.

3. MAIN STAKEHOLDERS AND FINANCING BIODIVERSITY PROTECTION:

Main Stakeholders

Governmental Institutions

In this section, information about governmental institutions directly working or whose actions have implications on biodiversity conservation and sustainable natural resource use are presented.

The 64th Government has declared its 2016 Action Plan and within there exists specific actions targeting environment, local authorities and urban transformation, which are also related to biodiversity protection. Actions are foreseen falling under the jurisdiction of Ministry of Environment and Urbanization, Ministry of Forestry and Water Affairs, Ministry of Food, Agriculture and Livestock, Ministry of Development, Ministry of Culture and Tourism, Ministry of Finance and Undersecretariat of Treasury. In this framework Water Law will be gazetted, legislations on nature and biodiversity conservation will be updated and legal responsibilities for protected areas will be clarified. Finally Metropolitan Municipality Law will be reviewed.

The Ministry of Forestry and Water Affairs:

The Ministry (formerly structured as the Ministry of Environment and Forestry) was established in 2011. The vision of the Ministry is to be a respectable and leading institution ensuring the right to live in a healthy environment where fundamental requirements of existing and next generations are considered; life quality is enhanced and natural resources are managed reasonably. Therefore the Ministry of Forestry and Water Affairs is the public body which is the most related to and responsible from biodiversity conservation and sustainable natural resource use. Different general directorates established under the Ministry have different responsibilities and fields of activities in this respect:

- General Directorate of Forestry is managing more than 21.7 million hectares of state forests. Their mission is to protect forest resources against any threats and danger, to develop forest resources in a nature-friendly manner and to achieve sustainable forest management at a level that will provide far-reaching sustainable benefits for society in ecosystem integrity.
- General Directorate of Nature Conservation and National Parks is in charge of planning, managing and improving national parks, strict nature reserves, nature parks, natural monuments, wildlife reserves and managing hunting as well as protecting biodiversity of the country at the species level.
- General Directorate of Combating Desertification and Erosion was established in 2011 aiming at protecting soil, improving natural resources, combating desertification and erosion, setting politics and strategies related with avalanche and flood control activities and providing cooperation and coordination among related agents and agencies. It is the governmental body responsible for preparing the national action plans of Turkey on combatting desertification and following the United Nations Convention to Combat Desertification (UNCCD).
- General Directorate of Water Management is responsible for the preparation of river basin management plans for all river basins in Turkey. During the planning process of river basins, all protected areas or potential protected areas have to be identified in

- the river basin management plans and required measures need to be taken in order to reach “good ecological status” according to the Water Framework Directive.
- General Directorate of State Hydraulic Works is in charge of planning, management, improvement and operation of the water resources throughout the country.

The Ministry of Environment and Urbanization:

Established in 2011, the mission of the Ministry of Environment and Urbanization is to fulfill the works and services regarding planning, construction, transformation and environment management in order to supply cities having high quality of life and sustainable environment with regulatory, supervisory, participatory and solution-oriented perceptions. In the framework of the establishment of the Ministry, some of the departments, which were under the former Ministry of Environment and Forestry were transferred to Ministry of Environment and Urbanization. Yet, the overlapping duties and tasks create coordination problems for effective nature protection and law enforcement.

- General Directorate for Preservation of Natural Heritage is responsible for the final registry and approval of all kinds protected areas (including national parks², nature parks) and planning and managing Special Environmental Protection Areas and Natural Heritage Sites and integration of protected areas to the national plans. Their mission is to contribute to the protection of biodiversity, management of natural, historical and cultural assets sustainably and to support living in a healthy and clean environment.
- General Directorate of Environmental Impact Assessment (EIA), Permit and Inspection, among other tasks is responsible for realizing, monitoring and inspecting the EIAs and Strategic Environmental Assessments (SEAs) in Turkey; and monitoring all activities and facilities towards preventing environmental pollution and enhancing environment quality.
- General Directorate of Environmental Management’s vision is to prevent and control all contamination of the factors influencing the environmental pollution for providing a livable environment. Among others, it is responsible to prepare legislation, develop standards, measurement, detection and determine quality criteria related to prevention and control of environmental pollution and to give an opinion in terms of environmental pollution according to the receiving environment characteristics; to determine policies, strategies and relevant legislation on clean production and integrated pollution prevention activities; and to promote the use of clean energy especially in the renewable energy sources.
- General Directorate of Spatial Planning, among other tasks is responsible for macro-scale planning; urban strategies; coastal area planning; land development planning activities; urban study designs and geological surveys.

The Ministry of Food, Agriculture and Livestock:

The Ministry has the responsibility for coordination and utilization of all resources related to agriculture, such as cultivation and propagation of wild plant species, fisheries and aquaculture, implementation of agri-environmental measures under the IPARD Programme, which provides compensation payments for the farmers also living in protected areas and habitats in return for agri-environmental measures they voluntarily implement. Ministry’s missions are to ensure the sustainable use of agricultural and ecological resources; to

² Including the marine protected areas, which are not usually distinguished from terrestrial ones in Turkey.

increase standard of living in rural areas; and to ensure access to safe food and high-quality agricultural products needed by Turkey and world markets.

- General Directorate of Agricultural Reform's mission and objectives are to arrange agricultural structure in order to make useful this structure for our farmers' welfare and future. Its vision is to become a specialist institution, which makes arrangements on rural areas' agricultural structures to arrive world standards.
- General Directorate of Fisheries and Aquaculture is responsible for the management of marine, inland and coastal fisheries and aquaculture.
- General Directorate of Agricultural Research and Policies is responsible to conduct research studies on vegetable and animal production issues and make collaboration with international research institutions. Soil, Fertilizer and Water Resources Central Research Institute that is one the research unit of the general directorate will assist in monitoring information on soil, including organic carbon levels.
- General Directorate for Plant Production is responsible for cultivation and propagation of wild plant species, their certification and international trade.

The Ministry of Culture and Tourism:

The Ministry of Culture and Tourism was established with the mission of keeping the universal culture, art and tourism values of the country alive through sustainably protecting them, of facilitating access to information towards establishing social consciousness, and of increasing the share of Turkey in the world's tourism activities. The Ministry has been involved in biodiversity conservation issues through its legal liability on the Natural and Historical Heritage Sites (see Section 2 of the report), while natural protection responsibilities have recently been transferred to the Ministry of Environment and Urbanization.

- General Directorate of Investment and Business is - amongst many tasks - responsible from researching and prioritizing the resources which can be allocated to tourism at the national scale and from realizing studies towards protecting natural assets which can be used in the tourism sector. Blue flag certification of beaches, marinas and yachts is the responsibility of the general directorate.
- General Directorate of Cultural Assets and Museums is responsible from maintenance and restoration of cultural and natural assets, which require conservation, and carry out all tasks related to these by law 2863.

Undersecretariat of Treasury:

Undersecretariat of Treasury established under the Prime Ministry is an institution accepted as a pioneer in ensuring economic development and a model in institutional governance in Turkey. Its mission is to manage public financial assets and liabilities, to regulate, implement and supervise economic, financial and sectorial policies, and to ensure the coordination of international economic relations in cooperation with all economic actors in a transparent, accountable and efficient way in order to contribute to the development of Turkey. The Undersecretariat of Treasury contributes to governmental Institutions with special budgets to make up their budgetary deficits, if any, including the institutions working on topics related to natural resources.

The Ministry of Development:

The Ministry of Development of Turkey is an expert based organization, which plans and guides Turkey's development process in a macro approach and focuses on the coordination of policies and strategy development. This includes the plans on the use of natural

resources, including agricultural practices, forestry, urbanization and fisheries.

The Regional Development Agencies aim at developing the cooperation between public institutions, private sector and NGOs, to ensure effective use of resources and to mobilize local potential in order to accelerate regional development in line with the national development plan and programs and their principles and policies and finally to decrease the differences between and within regions. The development agencies can give financial and technical support to regional actors. There are 26 agencies in Turkey, which distributes funds accordingly with the needs of their region.

Türkiye Kalkınma Bankası (Development Bank of Turkey):

The bank was established as the State Industry and Labourer Investment Bank (Devlet Sanayi ve İşçi Yatırım Bankası A.Ş.) in 1975 and was changed to Development Bank of Turkey in 1988. The mission of the bank is to increase employment, income and welfare and thus to contribute to the development and sustainable growth of the country. The bank supports investments on the basis of region, sector and technology. The bank provides financial support to projects aiming at protecting environment; it focuses on projects on industry, tourism, renewable energy and energy efficiency.

Metropolitan Municipalities

There exist 81 provinces and 30 metropolitan municipalities in Turkey with populations over 750,000 inhabitants. Among the metropolitan municipalities two are actively collaborating with AFD on sustainable urban development and transport, which are also among the biggest metropolitan municipalities, namely İzmir and İstanbul Metropolitan Municipalities. Both metropolitan municipalities have special departments established for environmental management and protection practices. İzmir Metropolitan Municipality Environmental Management and Control Department is realizing projects on energy efficiency, sustainable urbanization and environment among other topics. İstanbul Metropolitan Municipality Directorate of Environmental Protection also works on energy efficiency, sustainable urbanization, environment, waste treatment and on different forms of pollution (environment, air, noise, etc.). Furthermore İstanbul Metropolitan Municipality Food, Agriculture and Livestock Department does realize projects on local development (agriculture, animal husbandry and ecotourism). Also, Antalya, Bursa, Denizli and Muğla Metropolitan Municipalities prioritized agriculture and rural development as key targets in their strategic plans. Finally, biodiversity research and conservation topics are listed as priority targets in Hatay and Samsun Metropolitan Municipalities' strategic plans.

Non-Governmental Organizations (NGOs)

In this section, information about a selected set of non-governmental organizations (NGOs) actively working on biodiversity conservation and sustainable natural resource use are presented.

The Turkish Foundation for Combating Soil Erosion, for Reforestation and the Protection of Natural Habitats (TEMA)

Founded in 1992, TEMA is one of the biggest NGOs working on biodiversity conservation and sustainable use of natural resources in Turkey. It implements educational activities, organizes awareness raising events and campaigns for community mobilization and empowerment. It implements model projects of various scale and intervenes on

government policies for proper environmental protection and conducts legal activities, both by legislation drafting and through its lawsuits.

World Wide Fund for Nature (WWF-Turkey)

WWF-Turkey is the national office of the World Wide Fund for Nature (WWF), an international nature conservation organization, established in 1961. WWF-Turkey (officially registered as “Doğal Hayatı Koruma Vakfı” in Turkey), is a non-profit organization, working in close collaboration with governmental organizations, private sector, scientific institutions, other NGO’s, media and local communities. WWF-Turkey has implemented projects on biodiversity conservation, freshwater, energy, climate change and other topics. WWF-Turkey also conducts campaigns to increase public awareness and organizes training and capacity building activities for governmental and non-governmental parties.

Doğa Koruma Merkezi (Nature Conservation Centre)

Doğa Koruma Merkezi is a foundation established in 2004 by a group of experienced ecologists and nature conservationists. DKM's members have each had a long involvement in nature and environmental conservation in Turkey, with some individual's active interest and experience both here and abroad stretching back to the 1960s. In Turkey, DKM's members have worked with government, the private sector, NGOs, research institutions, individual experts and volunteers, carrying out major studies of mountain, forest, wetland and steppe ecosystems. Throughout its work DKM uses conservation science to deliver comprehensive and innovative conservation solutions.

Yaşama Dair Vakıf (YADA Foundation)

Yaşama Dair Vakıf was founded in 2005 with a vision of building bridges between “knowledge” and “society”. YADA aims to produce knowledge regarding the different aspects of social life and to convert this knowledge into application. YADA conducts its work in the fields of political sciences, sociology, communication, statistics, environment and cultural studies.

Doğa Araştırmaları Derneği (Nature Research Society)

Founded in 1998, Doğa Araştırmaları Derneği is one of the NGOs in Turkey actively working on wetland conservation, species research and monitoring (especially on birds), environmental training, developing species action plans and national bird ringing schemes. It has developed and implemented management plans towards different wetlands of international importance in Turkey, and species action plans for priority species.

Doğa Derneği (BirdLife in Turkey)

Doğa Derneği, BirdLife International’s partner in Turkey, was established in 2002. Doğa Derneği conducts species conservation on primarily bird species in line with the international program and priorities of BirdLife International. Their second pillar focuses on Key Biodiversity Areas (KBAs) identified for Turkey by the organization for the first time, as a network of threatened sites that are globally irreplaceable. The third area of work addresses rivers and lakes as the main natural systems interconnecting all forms of life on earth.

Sualtı Araştırmaları Derneği (Under Water Research Association)

Sualtı Araştırmaları Derneği, established in 1994, is one of the few NGOs focused on conservation of marine ecosystems and the species linked to it. The work of the NGO on Mediterranean monk seal (*Monachus monachus*) is recognized internationally.

Buğday Ekolojik Yaşamı Destekleme Derneği (Buğday Association)

Buğday is an NGO working actively to achieve its mission to creating ecological living conscience and sensitivity in the society both on the individual basis and as a whole; to offering solutions to the problems arising due to the irreversible destruction of the ecological systems and to support living in harmony with nature. Its main fields of activities are organic agriculture, agro-biodiversity research, capacity raising, eco-agricultural tourism and urban agricultural practices. It is one of the NGOs in Turkey with an active voluntary network.

Universities

36 Biology Departments and 12 Forestry Faculties among different universities provide relevant research and data on biodiversity and natural resource use in Turkey. Among the biology departments, the majority of the research topics are on systematic questions (taxonomy) and inventories. Other aspects of biological sciences (e.g. population dynamics and long term monitoring studies) are not common at the national scale. Regarding the forestry faculties, their main priority is sustainable forest management, industrial timber production, and social forestry activities. There is less attention to biodiversity conservation. Works on conservation of forest species and habitat are not prioritized at most of the faculties.

International Organizations

In this section, information about international organizations supporting financially and/or technically projects on biodiversity conservation and sustainable natural resource use are presented.

Food and Agriculture Organization of the United Nations (FAO)

Food and Agriculture Organization of the United Nations (FAO) has a regional office in Ankara. FAO-Turkey Partnership Programme aims at providing assistance on food security and rural poverty reduction in Turkey. A trust fund financed by the Government of Turkey – represented by the Ministry of Food, Agriculture and Livestock – supports the programme. Established in 2006, the Programme to date has benefitted from trust fund contributions totaling 20 million USD from Turkey.

The Programme is demand-driven, responding to priority problems identified by national or subregional stakeholders and expressed in the form of official requests. Work is focused in six broad areas – food security, agricultural and rural development, natural resources management including forestry and fisheries, agricultural policies, food safety, and animal and plant genetic resources.

United Nations Development Programme (UNDP)

United Nations Development Programme (UNDP) has been actively working in Turkey for more than 50 years and it has implemented over 80 programs across the country. It aims to find practical solutions to Turkey's development challenges and manages projects together with the Turkish Government and other partners to address them. The current target of UNDP Turkey is inclusive and sustainable growth, inclusive and democratic governance and climate change and environment. It also emphasizes the role of women, private sector,

capacity development, and information and communication technologies in its policies and programmes. Through various funding sources, UNDP Turkey has been implementing projects on climate change adaptation, biodiversity conservation and protected areas, forestry, agriculture and rural development in collaboration with related governmental organizations, NGOs, universities and private sector in Turkey.

UNDP is also one of the Global Environment Fund (GEF) implementing agencies in Turkey. Since joining the GEF, Turkey received GEF grants totaling 75.5 million USD that leveraged 433.9 million USD in co-financing resources for 21 national projects. These include 7 projects in climate change, 1 in land degradation, 6 in biodiversity, 1 in international waters, 3 in persistent organic pollutants and 3 multi-focal area projects. Similarly, Turkey participated in 21 regional and global projects financed by the GEF totaling 133.3 million USD that leveraged 222.9 million USD in co-financing resources. These include 13 projects in international waters, 4 multi-focal area projects, 2 in biodiversity, 1 in land degradation and 1 in persistent organic pollutants.

United Nations Development Programme Global Environment Fund Small Grants Program (UNDP GEF-SGP)

GEF-SGP is a corporate program implemented by the United Nations Development Programme (UNDP). UNDP implements this program on behalf the GEF partnership, made up of the United Nations Environment Program (UNEP), UNDP and the World Bank. Launched in 1992, GEF-SGP supports activities of non-governmental and community-based organizations in Turkey towards climate change abatement and conservation of biodiversity while generating sustainable livelihoods. The maximum grant amount is 50,000 USD per project for an organization at each grant period.

The World Bank

In Turkey, World Bank supported and credited more than 200 different projects with a total of over 18 billion USD for portfolio, financial sector and private sector improvement; energy; city development; health; education and environmental management. Among these projects 4 was on watershed rehabilitation and biodiversity and natural resource management. During the last 10 years, the projects financed by the World Bank in Turkey mainly targeted energy efficiency, renewable energy, transportation, access to finance for SMEs and municipal infrastructure. Furthermore smaller scale projects targeting natural resource management (i.e. forest ecosystem and water resources) are supported by the World Bank and carried out together with governmental agencies.

Since the mid-1990s, the World Bank relations with civil society have increased. World Bank interacts with thousands of Civil Society Organizations (CSOs) throughout the world at the global, regional, and country levels including Turkey. These CSOs include NGOs, trade unions, faith-based organizations, indigenous people movements, foundations and many others. These interactions range from CSOs who critically monitor the Bank's work and engage the Bank in policy discussions, to those which actively collaborate with the Bank in operational activities. There are many examples of active partnerships in the areas of forest conservation, AIDS vaccines, rural poverty, micro-credit, and internet development.

Delegation of the European Union to Turkey

Delegation of the European Union to Turkey represents European Commission in diplomatic and political terms in Turkey. It is the bidding agency of European Union Turkey Delegation

and therefore publishes the announcements of relevant project call and bidding procedures from its website. Furthermore, it maintains close contacts and coordinates its work with the embassies of the member states of the EU accredited to Turkey. The Delegation also maintains a wide range of contacts with public authorities, political parties, business circles, academia and think tanks, civil society organizations and cultural operators.

German International Cooperation (GIZ)

Active in Turkey since 1998, GIZ's activities did focus on climate change mitigation and adaptation, economic development and reconstruction assistance for Syria. GIZ implements projects on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ), the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and the Federal Foreign Office.

Japan International Cooperation Agency (JICA)

JICA, a bilateral Official Development Assistance agency, has been active in Turkey since 1959 and opened its office in 1995. JICA has strived to accelerate Turkey's socio-economic development by tackling broad issues, such as transportation, energy, mining, agriculture, fishery, forestry, environment, human resources, regional development, health, disaster management and water supply & sewerage. JICA has three different ways of intervention in Turkey: technical cooperation, voluntary program and concessional loans and investment. Three main intervention areas for JICA are: development of business and investment environment, capacity development to decrease impacts of natural disasters, strengthening development cooperation relations. Two of the sub-priority areas of JICA are (i) environment and energy, and (ii) fisheries and agriculture/regional development, under the improvement of business and investment environment.

The European Investment Bank (EIB)

The European Investment Bank has been founded in 1958. It operates in the Member States and more than 130 other countries including Turkey (since 1964). The bank provides finance and expertise for investment projects, which contribute to furthering EU policy objectives. The EIB currently lends in Turkey on the basis of an EU budget guarantee (the "Mandate") and at own risk to its balance sheet, via its Pre-Accession Facility. Since 1964 the bank has lent a total of 14.3 billion € in the country. The three pillars defining the priority investment topics of the bank are: lending in favor of infrastructure (both with central government as at the municipal level); small and medium sized enterprises ("SMEs"); and the corporate sector. The bank gives a priority to transport, energy (including renewables and energy efficiency), the environment and the financing of SMEs through a wide network of public and private sector partner banks in Turkey with an aim at supporting the economic development of the country.

In 2014, EIB provided a strong support to small and medium-sized companies (SMEs) in Turkey, as well as important infrastructure projects and the Research, Development and Innovation (RDI) activities of innovative export-oriented companies, transport, telecoms, environment, tourism, energy and urban development.

Agence Française de Développement (AFD³ ; French Development Agency)

AFD is a public development-finance institution that has worked for more than seventy years

³ www.afd.fr

to alleviate poverty and foster sustainable development in the developing world and in the French Overseas Provinces. AFD executes the French Government's development aid policies. Working on four continents, AFD has seventy-two field offices and bureaus, including nine in France's overseas provinces and one in Brussels. The Agency provides financing and support for projects that improve living conditions, promote economic growth, and protect the planet. In 2015, AFD Group has granted EUR 8.1 billion of commitments, to support a more equitable and more sustainable world.

AFD fulfills its mission with help from its private-sector affiliate, Proparco. The private sector is an essential link in the development chain because it creates jobs and invigorates economies. In addition, AFD manages the FFEM, the French Global Environment Facility, financing innovative environmental projects that preserve biodiversity, fight climate change, and prevent land and forest degradation, among other vital actions.

Since 2005, AFD's action in Turkey is part of its regional operations framework in the Mediterranean region and contributes to strengthen the French-Turkish partnership on climate and environmental issues. The aim is to provide joint responses to preserve Mediterranean ecosystems and limit greenhouse gas emissions.

AFD operates in Turkey since 2004 and opened an office in Istanbul in 2005. AFD's intervention in Turkey is part of its regional operations in the Mediterranean and contributes to strengthening the French-Turkish partnership on sustainable development. The main strategic areas of AFD intervention in Turkey for the 2014-2017 period are: supporting sustainable urban development, supporting businesses to adapt to changes in the economy, preserving and developing natural resources and promoting equal access to employment.

The financial tools of AFD in Turkey are the following:

- Sovereign loan to the State or to the municipalities with the guarantee of the State;
- Non-sovereign loan to municipalities (as well as to companies and credit institutions), without the guarantee of the State;
- Limited possibility for subsidies; available on subjects of capacity building or via the FFEM - French Environmental Fund - for projects related to the biodiversity, rural development or natural resource resources;
- Technical assistance, as well as specific support to professional training through the intervention of its training center in Marseille (CEFEB).

Recognizing the importance of forestry sector for Turkey in terms of rural development and natural resources protection; AFD supports the activities of the General Directorate of Forestry – through loans to the Turkish Under-secretariat of Treasury – for afforestation, the rehabilitation of degraded forests and the combat against erosion and forest fires. In addition, a partnership between the Turkish General Directorate of Forestry and the French National Forestry Office contributes to the development of sustainable forest management and, more particularly, to climate change adaptation. Between 2014 and 2015, AFD contributed to the reforestation of some 380,000 ha, the restoration of some 310,000 ha of degraded forests and works to stem erosion on over 650,000 ha. These achievements should lead to an annual sequestration estimated at 9.5 million tons of CO₂ equivalent for thirty years, i.e. a total of 285 million tons of CO₂ equivalent over this period.

Besides, AFD supports the management of marine protected areas through the grants of the French Fund for Global Environment (FFEM) and also supports the development of sustainable tourism, particularly in coastal areas.

Foreign Governments

In this section, information about foreign governments giving financial and/or technical support to projects on biodiversity conservation and sustainable natural resource use are presented.

British Embassy

UK Foreign Office's (FCO) Prosperity Fund aims at promoting sustainable growth in line with the UK's development objectives on sustainable development and improving welfare in Turkey. The funds are distributed on 3 priority topics identified as: promoting sustainable, efficient and open economy, enhancing energy security and promoting energy efficiency and lastly tackling climate change through low carbon economic development.

The Netherlands Embassy

Since 2000, the Netherlands Embassy supports projects from local NGOs, non-profit educational institutions, lower governments and semi-governmental organizations in the framework of its Matra Programme. Matra is a bilateral assistance programme of the Netherlands that aims to support social transformation in countries neighboring the European Union. It focuses on activities that contribute to further development of an open, pluralist, democratic society, firmly embedded in the rule of law. The Netherlands also uses Matra to strengthen bilateral relations. The Matra Programme works via civil society organizations and authorities. Matra Programme distributes support to NGOs in line with the priority areas identified. In the past, the priority areas of the Matra Programme included biodiversity related topics. However in the last years this has changed and the funds are no longer distributed on this topic. The priority areas of 2015 are identified as: legislation and law, governance, public order and police, human rights and minorities.

Private Sector Companies

In this section, information about a selected set of private sector companies and banks is presented. The banks presented in this section was selected given their Corporate Social Responsibility Programmes (CSR) on biodiversity conservation and sustainable natural resource and the credits they give to SMEs. The companies were selected because of their active involvement and support to biodiversity conservation and sustainable natural resource use projects through their foundations, in terms of CSR Programmes. In comparison to international funds and government aid projects, the support from private sector companies and banks on biodiversity conservation and sustainable natural resource use under the CSR Programmes is small, yet the amount has relatively increased in the recent past. According to the 2010 Report of the Corporate Social Responsibility Association of Turkey, among the ISO-100 Companies' CSR activities 23% focused on environment as one of the most important topics to support in Turkey (Orhaner and Doğan, 2010).

British Petroleum (BP)/Baku-Tbilisi-Ceyhan Pipeline Company Environmental Investment Programme

Baku-Tbilisi-Ceyhan Pipeline Company Environmental Investment Programme (BTC-EIP) of British Petroleum (BP) was one of the pioneering companies giving support to NGOs to decrease its environmental impact along the pipeline construction. Many of the local and national NGOs working on biodiversity has benefitted from different projects supported by BTC-EIP either focused on species or habitats. The programme has currently been finalized; therefore the organization is referred to as British Petroleum in certain sections of the report.

Koç Holding

Koç Holding, one of the biggest private sector companies in Turkey, is supporting environment friendly practices under its Corporate Social Responsibility Program. Its support program covers public institutions, trade bodies and NGOs.

Private Sector Company Foundations

Coca-Cola Hayata Artı Vakfı

Coca-Cola Hayata Artı Vakfı is a foundation giving support to public institutions, NGOs, universities towards developing innovative, socially responsible, effective, measurable and sustainable solutions to environmental and social problems. Related to biodiversity and natural resources, water is the prime focus of the foundation and its support program. The water use in agricultural practices and innovative ways of enhancing the water use is the goal of the 3 projects supported by the foundation and carried out by Doğa Koruma Merkezi in partnership with the Ministry of Food, Agriculture and Livestock and the United Nations Development Programme (UNDP).

Unilever Foundation

Unilever Foundation is highly involved in water, sanitation and hygiene, livelihoods and sustainable sourcing. The foundation aims at decreasing its environmental footprint and creates added social value. It is one of the private sector companies which has a long history of supporting NGOs in Turkey. They also follow a zero waste policy in their factories and communicate that 90% of the environmental investments they carried out was reimbursed during the last 4 years.

İş Dünyası ve Sürdürülebilir Kalkınma Derneği

İş Dünyası ve Sürdürülebilir Kalkınma Derneği is the Turkish business partner and representative of the World Business Solutions for a Sustainable World (WBCSD). The society works with companies towards policy development and advocacy, capacity building and strategy development. Topics like ecosystem services, climate change, effective water management and sustainability for corporates are among the priority fields of action on environment for the society. It doesn't act as a donor organization but more like a strategic partner to private sector companies towards developing their infrastructure in Turkey. The organization has recently published State of Water in Turkey and New Perspectives in Water Management: Environmental Perspective and energy efficiency in vehicles reports.

Turkish Industry and Business Action (TÜSİAD)

Turkish Industry and Business Action (TÜSİAD) is a voluntary based civil society organization established by Turkish industrialists and businessmen in 1971 in order to represent the business world. Contributing to environmental sustainability is among the main aims of the organization. TÜSİAD encourages and supports young entrepreneurs on new and innovative topics like digital trading, alternative tourism, and green infrastructure and buildings.

Private Banks

Garanti Bank

Garanti Bank focuses on improving the basics of banking by integrating sustainability into its operations (Garanti Bank, 2014). According to the figures in the sustainability report of 2014, the bank gives a total of 1.4 billion TL support to agriculture sector, out of which 798 million TL is given to supporting small producers. The bank also supports irrigation schemes using solar energy under their agriculture and rural development strategy. Finally they have an evaluation system towards environmental and social impact of the projects they give credit to and they measure the environmental impact of their own activities. Garanti Bank is one of the few banks, which are highly involved in supporting NGOs working on environmental issues. It has been supporting WWF-Turkey as its main sponsor under the CSR framework since the last two decades. It aims at creating a cleaner and more livable world where nature is protected.

İş Bank

İş Bank adopts a universal sustainability approach. Under this framework, they use an Environmental Risk Evaluation Tool (ERET) to assist in assessment of the environmental and social risks of investments of corporate customers who require facility amount of 10 million USD (İş Bank, 2014). İş Bank collaborates with the Turkish Grain Board (Toprak Mahsulleri Ofisi; TMO) to extend loans against TMO receipts. The bank is also engaged in activities under the agreement framework and related to competitive calls issued by the Agriculture and Rural Development Support Institution (TKDK) under the EU's IPARD program. İş Bank is one of the few banks giving support to environmental projects under its Corporate Social Responsibility Program (CSR). It has mainly been involved in supporting afforestation activities carried out by NGOs, primarily TEMA Foundation in Turkey.

Türkiye Sınai Kalkınma Bankası A.S.

Established in 1950, Türkiye Sınai Kalkınma Bankası (TSKB) is Turkey's first privately-owned development and investment bank and it has been actively supporting Turkey's sustainable growth. The bank supports Turkey's sustainable growth via credits and corporate lending on industrial investments, energy and resource efficiency, environmental protection investments, renewable energy, sustainable tourism, education and health investments using multilateral funds from different development finance banks (i.e. World Bank, EIB, Council of European Development Bank, International Finance Corporation, KfW, AFD, Islamic Development Bank, EBRD, Development Bank of Austria and Japan Bank for International Cooperation; TSKB, 2014). Since 2007 the bank is running a CSR Project entitled "Our Priority is Environment". In this framework, among many activities, it has established www.cevreciyiz.com an important environmental portal at the national scale. It also works towards raising awareness on energy efficiency and has established a portal on this topic: www.tskbenerjiverimlilik.com.

Financing Environment and Biodiversity Protection

Government Funds

In the framework of this review, data on the annual financial records of different ministries were explored. These figures correspond not only to the budgets allocated to strict biodiversity protection but also to activities covering environmental issues in a broader sense with an impact on biodiversity and its protection (including forestry, agriculture etc.). The budgets presented make a total of 27.8 billion TL in 2014 (corresponding to 1.1% of GDP; app. 800 billion USD). When present, information from the Turkish Court of Accounts reports was employed and also data from the activity reports of the institutions were used. In Table 9 annual financial records gathered in this approach are summarized. These financial records contain salaries, revolving funds information⁴ and the budget from projects supported by different governmental funds. During our interviews, the Ministerial representatives from different hierarchical levels stated the presence of adequate budget for their activities coming from the Central Governmental Budget. In general terms, >90% of the budget allocated to the institutions listed below is invested. As an example, the inventory and monitoring projects (ongoing) realized at the provincial level coordinated by the General Directorate of Nature Protection and National Parks is supported by the Ministry of Development through a funding of >20 million TL.

Table 9. The annual financial records (realized budgets) of different Governmental Institutions

Governmental Institutions Name	Budget (in TL)	Euros (Rate: 3.1)	Year	Source	Link
Ministry of Forestry and Water Affairs	518 million TL ⁵	167 million €	2014	Turkish Court of Accounts	http://www.sayistay.gov.tr/rapor/kid/2014/Genel Bütçe Kapsamındaki %20Kamu İdareleri/ORMAN%20VE%20SU%20İŞLERİ%20BAKANLIĞI.pdf
Ministry of Forestry and Water Affairs General Directorate of Forestry	4.6 billion TL	1.5 billion €	2014	Turkish Court of Accounts	http://www.sayistay.gov.tr/rapor/kid/2014/Özel Bütçeli İdareler-B/ORMAN%20GENEL%20MÜDÜRLÜĞÜ.pdf

⁴ Corresponding to the institutions' income generated through selling goods and products, renting facilities, permits, etc.

⁵ This figure excludes the budgets of certain affiliate institutions, namely State Hydraulic Works, General Directorate of Forestry, General Directorate of Meteorology and Turkish Water Institute.

Governmental Institutions Name	Budget (in TL)	Euros (Rate: 3.1)	Year	Source	Link
Ministry of Forestry and Water Affairs General Directorate of Nature Protection and National Parks	175 million TL	56 million €	2014	<i>Comm. with Ministry Staff</i>	
Ministry of Forestry and Water Affairs General Directorate of State Hydraulic Works	10.9 billion TL	3.2 billion €	2014	Turkish Court of Accounts	http://www.sayistay.gov.tr/rapor/kid/2014/Özel Bütçeli İdareler-B/DEVLET%20SU%20İŞLERİ%20GENEL%20MÜDÜRLÜĞÜ.pdf
Ministry of Environment and Urbanization	2 billion TL ⁶	650 million €	2014	Activity Report	http://www.csb.gov.tr/db/strateji/edirdosya/2014 YILI IDARE FAALİYET RAPORU.pdf
Ministry of Environment and Urbanization General Directorate for Preservation of Natural Heritage	33 million TL	11 million €	2014	Activity Report	http://www.csb.gov.tr/db/strateji/edirdosya/2014 YILI IDARE FAALİYET RAPORU.pdf
Ministry of Environment and Urbanization General Directorate of Environmental Impact Assessment	34 million TL	11 million €	2014	Activity Report	http://www.csb.gov.tr/db/strateji/edirdosya/2014 YILI IDARE FAALİYET RAPORU.pdf
Ministry of Environment and Urbanization General Directorate of Environmental Management	198 million TL	64 million €	2014	Activity Report	http://www.csb.gov.tr/db/strateji/edirdosya/2014 YILI IDARE FAALİYET RAPORU.pdf
Ministry of Environment and Urbanization General Directorate of Spatial Planning	41 million TL	13 million €	2014	Activity Report	http://www.csb.gov.tr/db/strateji/edirdosya/2014 YILI IDARE FAALİYET RAPORU.pdf

⁶ This figure includes the budgets of all affiliate institutions.

Governmental Institutions Name	Budget (in TL)	Euros (Rate: 3.1)	Year	Source	Link
Ministry of Food, Agriculture and Livestock General Directorate of Agricultural Reform	971 million TL	313 million €	2014	Turkish Court of Accounts	http://www.sayistay.gov.tr/rapor/kid/2014/Genel Bütçe Kapsamındaki %20Kamu İdareleri/GIDA%20TARIM%20VE%20HAYVANCILIK%20BAKANLIĞI.pdf
Ministry of Food, Agriculture and Livestock General Directorate of Fisheries and Aquaculture	158 million TL	51 million €	2014	Turkish Court of Accounts	http://www.sayistay.gov.tr/rapor/kid/2014/Genel Bütçe Kapsamındaki %20Kamu İdareleri/GIDA%20TARIM%20VE%20HAYVANCILIK%20BAKANLIĞI.pdf
Ministry of Food, Agriculture and Livestock General Directorate of Agricultural Research and Policies	78 million TL	25 million €	2014	Turkish Court of Accounts	http://www.sayistay.gov.tr/rapor/kid/2014/Genel Bütçe Kapsamındaki %20Kamu İdareleri/GIDA%20TARIM%20VE%20HAYVANCILIK%20BAKANLIĞI.pdf
Ministry of Food, Agriculture and Livestock General Directorate for Plant Production	5.7 billion TL	1.8 billion €	2014	Turkish Court of Accounts	http://www.sayistay.gov.tr/rapor/kid/2014/Genel Bütçe Kapsamındaki %20Kamu İdareleri/GIDA%20TARIM%20VE%20HAYVANCILIK%20BAKANLIĞI.pdf
Ministry of Culture and Tourism	1.9 billion TL ⁷	610 million €	2013	Turkish Court of Accounts	http://www.sayistay.gov.tr/rapor/kid/2014/Genel Bütçe Kapsamındaki %20Kamu İdareleri/KÜLTÜR%20VE%20TURİZM%20BAKANLIĞI.pdf

⁷ This figure includes the budgets of all affiliate institutions.

Governmental Institutions Name	Budget (in TL)	Euros (Rate: 3.1)	Year	Source	Link
Ministry of Culture and Tourism General Directorate of Cultural Assets and Museums	351 million TL	113 million €	2013	Activity Report	https://www.kultur.gov.tr/Eklenti/23756,2013-idare-faaliyet-raporu-ana-metin-25042014.pdf?0
Ministry of Development	774 million TL	250 million €	2014	Activity Report	http://www.kalkinma.gov.tr/Lists/Yaynlar/Attachments/637/KALKINMA%20BAKANLIĞI%202014%20YILI%20FAALİYET%20RAPORU-06032015.pdf

Analysis of protected areas financial system

In 2009 a study was carried out assessing the expenditures and funding levels for the National Protected Area system in Turkey (Thomas, 2009). Consultations carried out in the study indicated that funding to achieve a satisfactory “basic” level of operation in protected areas would require a 50% increase, and a 100% increase was required to achieve the “optimum” level of operation.

Table 10. The total budgets allocated to protected areas in 2009 Turkey together with basic and optimal level budgets required (Thomas 2009).

Entity	2009 Total Budget (million USD)	Basic Level Budget (million USD)	Optimal Level Budget (million USD)
National Parks	28.8	43.2	57.6
Hunting and Wildlife	20.8	31.1	41.6
Wetlands	11.4	17.1	22.8
Budget of General Directorate of Nature Protection and National Parks	49.6	91.4	122
Special Environmental Protection Areas (General Directorate for Preservation of Natural Heritage)	23.7	26.7	29.7
Total Amounts	134.3	209.5	273.7

Government Aid Agency (GAA) Supported Projects

In this section a total of 18 projects realized between 1993 and 2015 (or still ongoing) through governmental aid agency support are listed. The total financing amount of the projects range between 300,000 € and 38 million USD for a total amount of >188 million €.

1993-1998: In-situ Conservation of Plant Genetic Diversity in Turkey Project (GEF 1 Project), Funded by: GEF/World Bank, Budget: app. 5 million USD

An initial project aiming at the in-situ conservation of plant genetic species in Turkey was implemented between 1993-1998 with the funding of GEF/World Bank. The project aimed at identifying and establishing in-situ conservation areas for the protection of genetic resources and wild relatives of non-woody and woody species and developing institutional capacity for preparing and implementing a national strategy for in-situ conservation. As a result, Turkey has identified and nominated three areas as '*Gene Conservation and Management Areas*'. These areas included agricultural, pharmaceutical and ornamental plant species as well as forested areas of value to the gene diversity of Turkey. This project was carried out in collaboration with the, at that time called, Ministry of Agriculture and Rural Affairs (MARA) and resulted in the establishment of a Geographical Information System using Remote Sensing within MARA and a National Plan for the in-situ conservation of plant genetic diversity in Turkey.

1999-2001: Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Emerald Network project, Funded by: EU

This project was initiated in 1999 and implemented through the selection of 10 pilot sites in Turkey and the establishment of a National Emerald Network Team. Turkey's involvement in the project was in the context of being a pilot country contributing to the 'Emerald Network Pilot Project'. The National Emerald Network Team was established under the at that time called "Ministry of Environment", an Administrative Committee was established with the members of various related governmental and non-governmental institutes, such as the Ministry of Agriculture and Rural Affairs, the State Planning Office and finally a Scientific Committee was established from members of universities and NGOs working in the area of nature conservation. The project was implemented through the Emerald Network Programme established by the Council of Europe and the European Union.

2000-2007: Biological Diversity and Natural Resources Management Project, Funded by: GEF/World Bank, Budget: 11.5 million USD

This project was implemented between 2000-2007 aiming at increasing the capacity on participatory and ecosystem based planning. Funded by GEF/World Bank, the project was one of the examples for attempts to harness socio-economic features into the planning process in Turkey. The selection of pilot sites was made according to the different phytogeographical regions of Turkey. As such, the project introduced a different approach for protected area management planning. The project enabled establishment of the Biological Diversity Monitoring Unit in the Ministry of Forestry and Water Affairs (*Ministry of Environment in that period*) and the development of a national database, namely 'The Noah's Ark Database'.

2004-2008: Capacity building in the field of Environment for Turkey, 'Nature Component' Project, Funded by: EU Twinning Project TR02-EN-01, Budget: 17.3 million €

This project was framed in the context of Turkey's Accession Partnership Document and National Programme supporting the EU Acquis harmonisation process. The project was

implemented in the period 2004 – 2008 and brought many relevant parties together in order to build capacity on the implementation of the Birds and Habitats Directives, other EU directives and the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The project hosted a number of study visits, trainings and workshops attended by relevant government institutions, universities, foreign experts and implemented site fieldworks.

2008-2009: Technical Assistance for Protection and Sustainable Development of Natural Resources and Biodiversity in the Yıldız Mountains in Turkey, Funded by: EU (EuropeAid/125289/D/SER/TR), Budget: 1.3 million €

This Cross Border Cooperation project between Turkey and Bulgaria was a first step towards planning the establishment of the proposed biosphere in the Yıldız Mountains in Turkey. It was implemented between December 2008 and November 2009 as a first step towards planning the establishment of the proposed Biosphere. The project focused on six main activities: inventory and planning, cooperation, environmental training and education, capacity building including community-based natural resource management, communication and supervision of renovation works for a new training centre.

2008-2010: “Establishment of Turkish Environmental Information Exchange Network”, Funded by EU Pre-accession financial assistance (TR 0603.12.01/001 EUROPEAID/125541/D/SER/TR), Budget: 11.5 million €

The purpose of the project was the establishment and further development of Turkish Environmental Information Exchange Network to improve the integration of environmental concerns into sectorial policies, plans and programmes. The TEIEN project was one of the most comprehensive database and software ever developed in Turkey. Under the TEIEN project new modules on Environmental Values and Pollution Maps Module, State of Environment Reporting Module, Environmental Problems and Priorities Reporting Module, Environmental Impact Assessment Module, Monitoring and Inspection Module and Environmental Indicators modules were developed.

2008-2012: Enhancing coverage and management effectiveness of the subsystem of forest protected areas in Turkey’s national system of protected areas (aka Enhancing Forest Protected Areas Management System in Turkey Project) Funded by Global Environment Fund (GEF), Budget: 4.3 million USD (GEF support: 972,000 USD; Co-financing: 3,304,000 USD)

The project was executed by the Ministry of Forestry and Water Affairs General Directorate of Nature Protection and National Parks and General Directorate of Forestry, and was implemented by United Nations Development Programme (UNDP) Turkey Office, in partnership with WWF-Turkey. Project reinforced nature protection and sustainable resource management around Kastamonu-Bartın Küre Mountains National Park (172,119 ha), as well as creating an active and wholesome management model, based on participation. The project’s main achievements were: Development and approval of the management plan through a participatory and consultative process, and establishment of a locally-based specific management unit; Establishment of an effective institutional coordination model; Sustainable forest management plans developed for the 17 forestry districts within the boundaries of the national park buffer zone; Direct support to sustainable livelihoods of buffer zone communities through small grants (including concrete steps to address human-wildlife conflict around the national park), and linkages to other supportive national programs such as the GEF Small Grants Program, the Forest Villages

Development program, and Regional Development Agencies; Achievement of certification of the national park as a PAN Parks network protected area, which has contributed to the objective of biodiversity conservation and sustainable development in the region; Initiation of replication of the buffer zone, zoned management, and participatory management plan approach at the systemic level, with similar approaches started for at least three other protected area sites, and foreseen for the national protected area system.

2009-2011: Communication Strategy and Ecological Impact Assessment for *Natura 2000* Implementation Project, Funded by: The Netherlands, G2G, Budget: app. 300,000 €

This Dutch funded (G2G) project was implemented in the period 2009-2011 aiming at strengthening the capacity of relevant organizations on the implementation of *Natura 2000* and developing a *Natura 2000* implementation strategy for Turkey. The project enabled the beneficiaries to identify clear steps with regard to the scientific work required as well as administrative structures required for the implementation of *Natura 2000* in Turkey. Clearly, this Technical Assistance originates from the developed National Strategy for Turkey on the Implementation of *Natura 2000*, specifically its data management and legislation component. The project also focused on the implementation aspects of the Birds and Habitats Directives through a large number of workshops organised since the beginning of the project whose outputs created the basis of the strategy.

2009-2013: Strengthening Protected Area Network of Turkey: Catalyzing Sustainability of Marine and Coastal Protected Areas. Funded by Global Environment Fund (GEF), Budget: 6.7 million USD (GEF support: 2,200,000 USD; Co-financing: 4,496,603 USD)

The project was implemented by UNDP Turkey and executed by the Ministry of Environment and Urbanization General Directorate for Preservation of Natural Heritage working in close cooperation with the General Directorate of Nature Protection and National Parks, and the former Ministry of Agriculture and Rural Affairs General Directorate Control Protection. The project aimed to strengthen Turkey's national marine and coastal protection system and to ensure its effective management by expanding national marine and coastal protected areas; establishing fisheries restricted areas; increasing management capacities of local marine and coastal protected areas authorities; strengthening the systems for sustainable marine and coastal protected area financing; preparing a national-level Marine and Coastal Protected Areas Strategy and Action Plan proposal.

2010-2013: Regional Environmental Network for Accession (RENA) Project, Funded by: EU's Instrument for Pre-Accession Assistance (IPA) Programme; Budget: app. 5.9 million €

The project aimed at enhancing regional environmental cooperation in the Western Balkans and Turkey for the EU Accession Process. In this process, RENA supported relevant administrative authorities through the establishment of working groups focusing on strategic planning for the pre-accession process, public participation, climate change, cross-border cooperation on environment and preparation of environmental investment projects. As for the environment component, the project aimed at achieving improvement in the transposition and implementation of the Environmental Acquis in the field of nature protection, water protection, environmental impact assessment and strategic environmental assessment.

2011-2013: "Strengthening of Institutional Capacity on CITES Implementations", Funded by: EU's Instrument for Pre-Accession Assistance (IPA) Programme, Budget: 1.5 million €

The overall objective of this IPA Project was to strengthen the sustainability of the biological diversity in line with CITES Regulation in Turkey. It was aimed to establish the framework conditions to achieve reform of the administrative, legal and technical structures to achieve an efficient application of CITES control in Turkey by the end of the project. Some of the relevant activities carried out such as; capacity building trainings, study visits, trade monitoring database, increase in custom controls.

2012 to date (to be finalised in 2019): Çoruh River Watershed Rehabilitation Project. Budget: 5.5 billion Japanese Yen (JICA support: 4,224,876,836 Japanese Yen; Co-financing: 1,324,037,408 Japanese Yen)

Japan International Cooperation Agency (JICA) supported project has been executed by the Ministry of Forestry and Water Affairs General Directorate of Forestry in collaboration with the General Directorate of Nature Protection and National Parks, General Directorate of State Hydraulic Works and Ministry of Food, Agriculture and Livestock. Project aims to provide integrated watershed rehabilitation including vegetation, soil and water resources; better living conditions for the rural population; soil conservation; rehabilitation of degraded forests; and prevention of natural disasters (avalanche, flood and overflow control) in Çoruh River Watershed.

2012 to date (to be finalised in 2018): Murat River Watershed Rehabilitation Project. Budget: 38.6 million USD (IFAD support: 28,221,000 USD (with 430,000 USD grant); Co-financing: 7,453,100 USD)

The project is funded by the International Fund for Agricultural Development (IFAD) and executed by the Ministry of Forestry and Water Affairs General Directorate of Forestry and General Directorate of Combating Desertification and Erosion. The project aims at improving livelihoods through the rehabilitation and sustainable use of natural assets. The overall project goal is reduced poverty among the upland communities of the Murat River Watershed. The development objective is improved livelihood and natural resources management in the upper catchment areas in the Murat River Watershed. The project specifically focus on village dwellers' involvement in the decision-making and implementation processes relating to the rehabilitation of the existing natural resources while facilitating the creation of a strong sense of ownership among the upland communities and thereby ensuring sustainability of the investments.

2013 to date (to be finalised in 2016): Environment and Climate Regional Accession Network (ECRAN) Project, Funded by EU's Instrument for Pre-Accession Assistance (IPA); Budget: app. 10 million €

The objective of this EU funded project is similar to the RENA project aiming at enhancing regional cooperation and transposition of the Environmental Acquis for the Western Balkan Countries and Turkey. The project's nature working group focuses on the development of appropriate assessments for selected pilot sites, development of participatory management plans, awareness raising activities to promote *Natura 2000* and finally establishment of a regional network of protected areas.

2013 to date (to be finalised in 2018): Integrated Management of High Conservation Value Mediterranean Forests in Turkey (aka Integrated Forest Management Project). Funded by: United Nations Development Programme Global Environment Fund, Budget: 28.5 million USD (GEF support: 7,120,000 USD; Co-financing: 21,430,000 USD)

The project is executed by the Ministry of Forestry and Water Affairs General Directorate of Forestry and is implemented by UNDP Turkey with the financial support of GEF. DKM (Nature Conservation Centre), ORKOOP (Central Union of Forest Cooperatives), OMO (Chamber of Forest Engineers), GIZ, WWF-Turkey, and Gold Standard Foundation are the project partners. The project aims to demonstrate the multiple benefits of the high conservation value forests in the Mediterranean forest region, to ensure the conservation of biodiversity and carbon storage in these areas, thus to promote integrated management approach for the management of Turkey's forests. Through practices that will be implemented in 500,000 hectares of area; carbon storage capacity and emissions reductions will be increased and 80,000 hectares of protection forest will be established. Ecotourism activities (such as birdwatching, hiking and biking) will also be realized within the project that aims to plan non-timber forest products through value chain planning for creating more employment and revenues. Through new management plans that take into account the relations between sectors in the Mediterranean Region, the functions provided by forests will be strengthened in terms of climate and biodiversity. Project pilot areas are Köyceğiz Forest Enterprise Directorate (FED), Gazipaşa FED, Gülnar FED, Pos FED, and Andırın FED.

2014 to date (to be finalised in December 2015), Water Framework Directive Explorer Ecological Modelling Project, Funded by Dutch Government, Budget: 395,000 €

With funding through the "Partners for Waters" Programme, the River Basin Explorer ecological modelling project was initiated in July 2014 in close collaboration with the General Directorate of Water Management of the Ministry of Forestry and Water Affairs. The project aims at developing an EU Water Framework Directive modelling platform to estimate compliance with EU water quality standards. Both the current and future situation, based on the application of a range of water quality measures, can be modelled by specialist and non-specialist users. Backed up by a significant database related to the EU Water Framework Directive's requirements, the model was developed in a pilot river basin namely Büyük Menderes Delta.

2014 to date (to be finalised in December 2017) Technical Assistance Project "Conversion of River Basin Protection Action Plans into River Basin Management Plans" (EuropeAid/134561/D/SER/TR), Budget: 7.8 million €

The project aims to undertake biological, chemical and hydromorphological monitoring in four basins in Turkey (Ergene Basin, Büyük Menderes Basin, Susurluk Basin and Konya Closed Basin). Furthermore, in the framework of the project, a programme of measures and conversion of the River Basin Protection Action Plans into River Basin Management Plans will be developed. Finally the project aims at developing a water information system including a data management system, GIS mapping and a decision support system (Aquatool).

2014-2015: Institutional Capacity Building for Fishery Producer Organisations Project, Funded by EU Twinning Project TR-11-IBA-G01, Budget: 1 million €

The project was carried out in partnership between the Ministry of Food, Agriculture and Livestock and partners from the Netherlands, Sweden and France. The project aimed to contribute to a sustainable fisheries and aquaculture sector in Turkey by aligning Turkish legislation with the relevant EU Legislation (the Common Market Organization and Common Fisheries Policy). In the EU Member States fishermen, fish farmers and other stakeholders work closely together to manage their sector by organising the market through producer organizations. In Turkey the project aimed to build institutional capacity and have a skilled

team to support this development as well. The team, involving Turkish, Dutch, French and Swedish experts tested mechanisms and interventions that support balancing supply and demand, fair prices for fishermen and fish farmers and provide high quality fisheries and aquaculture products to consumers.

United Nations Development Programme Global Environment Fund Small Grants Program (UNDP GEF-SGP) Turkey Activities:

UNDP GEF-SGP has supported 236 projects of 149 different civil society organizations in 20 years (1994-2014) in Turkey. The total support given was 5,300,000 USD with an additional co-financing of 8,500,000 USD by the project owners and their partners.

This program has prioritized local communities, social and economic issues and gender concerns. By raising public awareness, building partnerships, and encouraging policy dialogue, SGP Turkey promotes an enabling environment for stakeholders to achieve sustainable development by addressing global environmental issues.

As a result of GEF-SGP projects, conservation activities on 22 National Parks, 19 Wildlife Reserves and 11 Nature Reserves were supported through the direct contribution of local communities. 42,325 ha were included in forest conservation, 8,850 ha of forest were restored and almost 4 million trees were planted through the involvement of more than 900,000 nature volunteers. Climate resilience activities were also implemented at local scale through GEF-SGP supported small-scale projects.

Projects of NGOs

In this section, we give a list of selected NGO projects related to nature protection and biodiversity conservation, which especially had solid and successful outputs at local, regional and/or national scales in Turkey. A total of 18 projects realized by 8 NGOs between 1987 and 2015 (or still ongoing) are listed, majority covering the last decade. The financing amount of the projects range between 90,000 USD and 2.1 million €, for a total amount of >8 million €.

Doğa Koruma Merkezi (DKM; Nature Conservation Centre):

2006-2009, The Anatolian Diagonal: Conservation Priority Analysis for the Eastern Mediterranean and Eastern Anatolian Ecoregions Project, Funded by Baku-Tbilisi-Ceyhan Pipeline Company's Environmental Investment Programme (EIP), Turkey, Budget: 977,000 €

The main goal of this project was to develop tools and basis for key implementers for conservation and sustainable use of the Eastern Mediterranean and Eastern Anatolian Ecoregions' biodiversity and natural resources. The objectives of the project were to: (i) establishing a basis for conservation planning in the central and southern EIP regions, (ii) identifying priority conservation areas and to produce management guidelines for their conservation and (iii) improving conservation planning methodology and to integrate national programs. In the project, a methodology was adopted to form the basis for the Systematic Conservation Planning (SCP) in the area, a widely used approach to halt biodiversity loss with conservation prioritization and strengthening the protected area networks. DKM's work included gathering and analyzing new and existing data on species and landscape features for 83,893 km² of Turkey. For this, all the possible sources were examined and then filtered to produce healthy set of data. Biological, geographical and socio-economic data collected through literature surveys was improved with the detailed field data. Besides, habitat modelling was conducted for the key species to improve their distribution data. A mixture of fieldwork, Remote Sensing, GIS and computer-aided analysis

was used to identify priority conservation areas in the region and to make practical recommendations for their conservation.

2009-2010, The Adaptation of Forest Ecosystems and Forestry to Climate Change in the Seyhan Basin, Funded by United Nations Development Programme (UNDP) Millennium Development Goals Fund, Budget: 63,000 €

Mediterranean Region covering Seyhan River Basin was represented as one of the most vulnerable and undefended regions to climate change according to the 2007 Evaluation Report of Intergovernmental Panel on Climate Change (IPCC). Seyhan Basin was therefore selected as the pilot site for adaptation to climate change within the Enhancing the Capacity of Turkey to Adapt to Climate Change UN Joint Programme. United Nations Development Programme (UNDP) started a Grant Programme in Seyhan River Basin. In this project DKM worked closely with the Adana District Forestry Directorate towards integrating the impacts of climate change to the forestry application in Seyhan River Basin. DKM's tasks included the use of GIS analysis and spatial modelling techniques in predicting the impact of climate change on four main forest types in the Seyhan Basin (namely Taurus fir (*Abies cilicica*), cedar (*Cedrus libani*), black pine (*Pinus nigra*), Turkish pine (*Pinus brutia*), an area of 20,450 km² in southern Turkey. Another task performed by DKM staff was further analyses for determining forest areas that will become increasingly vulnerable through the course of climate change. Through this project, DKM has provided an approved strategy for developing effective adaptation measures for forests, as well as devising a clear methodology for analysing the effects of climate change in Mediterranean forests and determining the spatial pattern of vulnerabilities expected to arise (Zeydanlı et al., 2010).

2009-2011, Developing a Basis for the Active Conservation of Turkey's Butterflies, Funded by BBI-Matra Programme, Dutch Government, Budget: 217,000 €

The project aimed at establishing and developing a basis for the active conservation of Turkey's butterflies. The key results and impacts of this project was making all of the existing Turkish butterfly data freely available for conservation studies; producing an agreed provisional Red List of Turkey's butterflies; producing a candidate list of Turkey's Prime Butterfly Areas (PBAs) identified using Systematic Conservation Planning (SCP) approach; initiating high priority surveys, monitoring and management at one demonstration PBA; developing a trained and active core group of Turkish butterfly watchers and experts; assisting the relevant government agencies to better implement conservation action for Turkey's butterflies in protected areas and the wider countryside; and raising awareness of the richness and importance of Turkey's butterfly fauna. All of the above will be underpinned by sound, objective data collection and analysis to prioritise actions and maximise use of resources.

2009 to date; Integrating Biodiversity into Forestry Project, Funded by Baku-Tbilisi-Ceyhan Pipeline Company's Environmental Investment Programme (EIP), Turkey, Budget: 530,000 €

Forests in Turkey are managed through forest management plans made and applied by the Ministry of Forestry and Water Affairs General Directorate of Forestry (GDF). In 2004, GDF adopted a new planning scheme, which aims to determine, plan and manage different functions of the forest. The functions of the forest are grouped into three categories as economical, ecological and social. GDF sought feasible ways/methods to assess and allocate different functions of the forest in their plans. DKM has worked with GDF from 2009 to 2011 to develop an approach for the nature/biodiversity conservation function. For this aim, target forest species and their distribution in Turkey were determined through a detailed

scoring scheme by mammal, bird, reptile, amphibian, butterfly and plant experts. As a result, two manuals were prepared: one describing the steps of the integration process (inventory, modelling, zoning, assigning forest management decisions, control of the work and monitoring), the second giving the descriptions (identification, inventory, habitat requirements, critical periods etc.) of the target species, species specific forest management suggestions, descriptions of ecological processes (old-growth forests, marginal populations etc.). Many workshops were conducted and the manuals were prepared together with GDF personnel. The implementation phase of the project is ongoing in different forest subunits in Turkey.

2013 to date (to be finalised in December 2016); Life + Environment Programme Agriculture of the Future Project, Funded by Life Plus Foundation, Budget: 840,000 €

The project is carried out in Konya in cooperation with the Coca-Cola Life Plus Foundation, Ministry of Food, Agriculture and Livestock General Directorate of Agricultural Reform. The project aims at promoting ecosystem approach and climate change adaptation in agricultural practices in Konya. The project activities included conservation agriculture practices such as direct seeding and planting windbreaks, climate change modelling, ecosystem services mapping and biodiversity monitoring. Direct seeding practices and establishing wind breaks implemented in Karapınar, Cihanbeyli, Ilgın, Sarayönü and Güneysinir Districts aimed at improving the water holding capacity of soil and ensuring the efficient use of land and water. Within the scope of climate change modelling activities, temperature and precipitation change maps were prepared, which are beneficial tools to assess the potential impacts of climatic changes on the agricultural activities. As a part of the project biodiversity monitoring activities are being carried out on bird, plant, butterfly and small mammal species.

The Turkish Foundation for Combating Soil Erosion, for Reforestation and the Protection of Natural Habitats (TEMA) Foundation;

2007-2011, Kaçkar Mountains Sustainable Forest Use and Conservation Project, Funded by European Union Programme on Tropical Forests and other Forests in Developing Countries, Budget: 2.1 million €

The Kaçkar Mountains Sustainable Forest Use and Conservation Project was developed by the TEMA Foundation, Nature Conservation Centre (DKM) and the Middle East Technical University through intensive collaboration with the relevant public institutions and was presented to the European Union's Forests and Tropical Forests Grant Program for Developing Countries. The project was selected for funding by EU among 350 projects worldwide. The project budget was over two million €, and 80% of it was funded by the European Union, and 20% by the TEMA Foundation. The project, backed by the former General Directorate for Development of Agricultural Production (TÜGEM), BTC Pipeline Company (mostly in kind contribution for preparing management plans of forests), IZODER (in kind support in terms expertise for the insulation studies), Citibank and Artvin Governor's Office as well, and further strengthened by the support of local organizations and local people, has been a successful model showing how well the European Union, NGOs, universities, public institutions and local people can conduct a project in harmony, and is an important example of organization in addition to its contents. The target of the project was decelerating and reversing the process of loss of biodiversity and deterioration of forest ecosystem in the part of the Kaçkar Mountains. The project components included conservation of biodiversity, sustainable forest use, guidance of local people to use forest

sources in a sustainable manner, conservation and improvement of wildlife, and management of impact of tourism on forests.

World Wide Fund for Nature (WWF- Turkey):

2003, Important Plant Areas of Turkey Project

The “Important Plant Areas in Turkey” Project carried out by the former WWF-Turkey (namely Doğal Hayatı Koruma Derneği) with the collaboration of Fauna & Flora International and Istanbul University Department of Pharmaceutical Botany has led to the identification of 122 Important Plant Areas (IPAs) in Turkey for the first time (Özhatay et al., 2003). These sites were identified with the contribution of numerous national and international experts according to international criteria, were among the first of their kinds in Turkey. This study, along with others, provide a robust basis for the identification of the potential *Natura 2000* areas in Turkey and for the implementation of the Bird and Habitats Directives.

2009 to date (to be finalised in 2017), MedPAN South Project and SEA-Med project (Sustainable Economic Activities in Mediterranean Marine Protected Areas), Funded by MAVA Foundation, Fonds Français pour l'Environnement Mondial (FFEM)

The MedPAN South Project (2009-2012) was a collaborative project aimed at improving the management effectiveness of Marine Protected Areas (MPAs) in the south and east of the Mediterranean and supporting the creation of new ones. In Turkey, during the MedPAN South project, WWF MedPO and WWF-Turkey joined forces to assist the national MPA authorities in developing and implementing the management plan for the marine area of the Kaş-Kekova MPA. Although in Turkish MPAs there is not a local MPA authority with staff and rangers, WWF-Turkey signed an agreement with the Ministry of Environment and Urbanization General Directorate for Preservation of Natural Heritage to develop the management plan with both the national and local stakeholders and authorities while waiting for the review of the National System of MPAs. Ten years of research data was used to establish important ecological areas for conservation and biodiversity, and socio-economic data was collected to guide the identification of management objectives and the design of users' zones and monitoring plans. A zoning map, which shows the regulations of fishing, diving and anchoring activities, has been created, fisheries regulations were gazetted in the official paper in 2012 and enforced by the Coast Guards, diving clubs signed and implemented a diving chart with the local authorities, and the General Directorate endorsed the MPA management plan. The SEA-Med project (Sustainable Economic Activities in Mediterranean Marine Protected Areas) started following the MedPAN project is led by WWF Mediterranean Programme Office (WWF-MedPO), supporting 8 Marine Protected Areas (MPAs) in 6 Mediterranean countries (Tunisia, Algeria, Libya, Turkey, Albania and Croatia). Specifically, the SEA-Med Field Project in Turkey aims at implementing the Management Plan of Kaş-Kekova Special Environmental Protection Area and developing a sustainable tourism plan to advance sustainable tourism practices, promote nature-based tourism initiative. In parallel, the project will work towards establishing a sustainable governance system for Kaş-Kekova.

2014 to date (to be finalised in 2016), Adapting Mediterranean Forests to Climate Change Project, Funded by: MAVA Foundation, Budget: 328,000 €

Adapting Mediterranean Forests to Climate Change Project is being carried out in partnership with Ministry of Forestry and Water Affairs General Directorate of Forestry, WWF-Turkey and Nature Conservation Centre (DKM). The aim of the project is to fill the knowledge gap between the academic/research level and the practitioners (forest planners

& managers) regarding adaptation of forests to climate change through a set of actions, including the assessment of current and projected impacts, interventions in pilot areas and the exchange of information and good practices. This project concept was designed also to achieve the vision of a pan-Mediterranean Forest Strategy shared by four national organizations of WWF in the region, namely Turkey, Greece, Italy, Spain and the MedPO (called Mediterranean Initiative). In the framework of the project, the forest subunits in the General Directorate of Forestry Konya Region were modelled to assess the impact of climate change in the dominant tree species of the area. As a result of the project, it is aimed to acquire an increased knowledge of the health status of forests addressed, an increased knowledge of future impacts that the climate change will pose to the forest habitat addressed by the project, to develop/update management plans incorporating specific adaptation measures approved by the forest management institutions, to identify interventions aiming to enhance forest resistance and resilience in place at pilot sites, to increase awareness of stakeholders involved in forest management and to enhance exchange of information on forest impacts posed by climate change and on adaptation measures at the regional level.

Doğa Derneği (BirdLife in Turkey):

2006: Publication of Key Biodiversity Areas Book. Funded by: Baku-Tbilisi-Ceyhan Pipeline Company's Environmental Investment Programme; Netherlands Embassy; Netherlands Ministry of Agriculture, Nature and Food; GEF-SGP. Budget: app. 120,000 €

Doğa Derneği has identified sites of global conservation concern in Turkey using the Key Biodiversity Areas (KBA) approach. This approach is built on BirdLife International's successful and well-established concept of Important Bird Areas (IBA). The KBA method, at a national scale, is first ever implemented by Doğa Derneği in Turkey resulting in identification of 305 sites covering 26% of the country. This was the first published national inventory of Key Biodiversity Areas in the world. The sites were selected for plants, birds, mammals, reptiles, amphibians, freshwater fish, butterflies and dragonflies. For this work Doğa Derneği has worked with around 100 scientists and several NGOs. This massive work was published as a book of 1,100 pages. Each chapter supported with topographic and habitat classification maps.

2012-2014: Preparing the basis for an inventory of Marine Important Bird Areas along the southern Black Sea Coast (Romania, Bulgaria and Turkey). Funded by European Commission, Budget: 239,541 €

Project was supported by the European Commission and implemented by the Doğa Derneği in collaboration with the Hellenic Ornithological Society, Bulgarian Society for the Protection of Birds and the Romanian Ornithological Society, in the Southern Black Sea Region. The project aimed to create the basis for an inventory of Marine Important Bird Areas (IBAs) for two seabird species; yelkouan shearwater (*Puffinus yelkouan*), and European shag (*Phalacrocorax aristotelis*); and to train staff and volunteers from Romania, Bulgaria and Turkey on seabird research and conservation methods.

Sualtı Araştırmaları Derneği (SAD; the Under Water Research Association):

1987 to date; Monitoring of Important Monk Seal Sites of Turkey, Funded by: SAD-AFAG, İş Bank, Henry Ford Foundation Budget: 250,000 USD

Monitoring of Important Monk Seal (*Monachus monachus*) Sites of Turkey is a long term database project in which all the Mediterranean monk seals' observation records have been gathered since 1987. The database entitled to "FokData" includes over 1,800 records and it

is an important project in terms of designating protection priority areas in Turkey, which enables us to show the current range of species of the Mediterranean monk seals. The monk seal observation records belonging to first hand reliable sources and the Under Water Research Association Mediterranean Monk Seal Research Group (SAD-AFAG) and Middle East Technical University Under Water Sports (METU-SAS) divers & researchers have been taken into account and entered into SAD-AFAG's FokData base program for 28 years continuously. The information in FokData have been used in "The National Plan for the Conservation of Mediterranean Monk Seal *Monachus monachus* in Turkey" report issued by SAD-AFAG as approved by the former Turkish Ministry of Forest and Regional Activity Center for Specially Protected Areas (RAC/SPA).

2009-2010, Gökova Special Environmental Protection Area (SEPA) Marine And Coastal Zone Management Plan Project, Funded by: BBI-Matra Programme, Dutch Government, Budget: 220,000 €

The project was conducted in cooperation with Netherland based Rubicon Foundation. All the coast lines and marine areas within Gökova Special Environmental Protection Area (SEPA) borders was searched and based on the results of the field studies, data obtained in the field of socio-economic, ecologic, maritime traffic and threats was transferred to Geographic Information System (GIS) database. Later, a group formed by the experts prepared a Marine and Coastal Zone Management Plan and submitted it to the local authorities in order to be approved for implementation. During whole stage of the data collection, evaluation and creation of management plan, SAD-AFAG, Rubicon, EPASA and the former Ministry of Agriculture and Rural Affairs worked in collaboration. The results obtained by common consensus were reflected on these reports. The project also contributed to the conservation of the monk seal and its habitat with a comprehensive marine & coastal zone management planning and implementation by the responsible governmental departments. One of the most comprehensive integrated coastal and marine management planning projects in Turkey.

2015 to date (to be finalised in 2017), Defence of Key Biodiversity Areas in Turkey, Funded by: MAVA Foundation, UNDP GEF-SGP, Van Tienhoven Foundation and SAD, Budget: 350,000 €

Defence and protection of coastal key biodiversity areas (KBAs) in Turkey aims solely for the protection of important coastal habitats against over and illegal coastal developments in the country. 10 priority coastal areas, which are also designated as KBAs, have been selected during the initial stages of the project. Close cooperation and communication with the relevant governmental departments is one of the most important method to be used in the project. Monitoring the sites are carried out project team members and SAD local representatives as well as conservationists who are also local people living along those coastal KBAs, and the coastal developments which will destroy natural habitats and breeding grounds of wildlife fauna and flora are reported with visual proofs.

Doğa Araştırmaları Derneği (Nature Research Society):

2004-2007, Developing Yumurtalık Lagoons Wetland Management Plan and Identifying Erzurum Marshes Conservation Zones, Partners: Tour du Valat Biological Station (France), ÇETKO (Adana), Funded by Baku-Tbilisi-Ceyhan Pipeline Company's Environmental Investment Programme, Budget: 350,000 USD

The project was designed to develop a management plan for Yumurtalık Lagoons where high biodiversity and intense human activity collapses in North-eastern Mediterranean coast, and

to identify conservation zones for Erzurum Marshes, a local wetland which breeds important biodiversity elements. A wetland management plan was successfully prepared for Yumurtalık Lagoons in Adana. To ensure a participatory plan, stakeholder involvement to the plan preparation was sought. Stakeholders were informed about the importance of wetlands and Yumurtalık Lagoons and several awareness raising activities were carried out among stakeholders; and meetings, visits, press releases, web sites, posters were used to reach the target groups. Detailed research about the biodiversity and functions and values of the lagoons were carried out. After the problem analysis management plan was prepared with the contribution of stakeholders. A Local Wetland Commission was established in order to support and coordinate the management plan implementation process. Also detailed biodiversity research was carried out in Erzurum Marshes. Together with other aspects such as land use, hydrology, etc. conservation zones of Erzurum Marshes were identified.

2008-2015, Yumurtalık Lagoons Wetland Management Plan Implementation Project, Funded by Baku-Tbilisi-Ceyhan Pipeline Company's Environmental Investment Programme, Budget: 625,000 USD

Following the approval of the Yumurtalık Lagoons Wetland Management Plan by the National Wetland Commission in 2008, the management plan was put into action. Doğa Araştırmaları Derneği developed this project in order to carry out the activities from which the society itself was responsible, to support the public institutions in implementation phase of the management plan. Institutionalisation of the management plan implementation, monitoring and evaluation mechanisms were supported by the project. A documentary about the functions and values of wetlands was prepared.

Yaşama Dair Vakıf (YADA Foundation):

2005-2015, "Life Plus" Youth Program, Funded by Coca-Cola Life Plus Foundation, Budget: 652,000 €

"Life Plus" Youth Program has been run in a partnership with United Nations Development Programme (UNDP), Coca-Cola Life Plus Foundation and Yaşama Dair Vakıf (YADA). Since 2005 the Program has supported 58 environmental projects in 36 cities. Every year an average of 7 projects were supported by the Program. YADA was appointed as the implementing partner of the "Life Plus" Youth Program in 2010. YADA visited project zones regularly as part of the monitoring and evaluation studies. During these visits, YADA team met with representatives of the target group, officers of public institutions, NGOs and academics alongside the project teams. YADA examined the projects' effects on society, contributions of the projects in policy and decision-making processes, and the effects on the attendance of NGOs. YADA monitored the projects and prepared an evaluation report for each project. The reports on the projects were used to develop the program in order to build better support strategies and criterion for the program. The results of the evaluation were also shared with project teams and leaders hence became tools for structuring the program and evaluating the potentials of partners.

Buğday Ekolojik Yaşamı Destekleme Derneği (Buğday Association):

2003 to date, Eco-Agro Tourism and Voluntary Exchange Farms (TATUTA) Project, Funded by UNDP GEF-SGP and Buğday Association, Budget: 90,000+ USD

This first 'rural tourism' project of Turkey aimed to support ecological agriculture farmers by providing them with the monetary support, and to solve the problems they face in the process. This project, which was supported by UNDP GEF-SGP, was one of the major resources of the project with its network of farmers and other prospects. TaTuTa Project and

Buğday Association is the official member of European Centre for Ecological and Agricultural Tourism (ECEAT) for Turkey, the national World Wide Opportunities on Organic Farms (WWOOF) organization of Turkey, and an accredited European Voluntary System (EVS) organization. WWOOF is a worldwide movement linking volunteers with organic farmers and growers to promote cultural and educational experiences based on trust and nonmonetary exchanges helping to build a sustainable global community.

2006-2008, Developing Environment Friendly Agriculture Policies Programme for Turkey, Funded by BBI MATRA, Dutch Government, Budget: 112,000 €

The project was carried out in partnership with Buğday Association, Avalon, and Institute for European Environmental Policy (IEEP). In the framework of the project a Handbook was producing presenting many of the key outputs, recommendations and accumulated expertise from the project (Redman and Hemmami, 2008). The handbook was intended as reference document to support the future programming of environment friendly agriculture measures in Turkey, with particular reference to the opportunities and obligations associated with EU co-financing. Special attention was also given to introducing the concept of High Nature Value (HNV) farming and the biodiversity benefits associated with using environment friendly agriculture (and other rural development) measures to maintain certain types of low intensity farming systems typically found in Turkey.

Conclusion about Main Stakeholders and Financing Biodiversity Protection

In the framework of this review, different stakeholders from governmental institutions, private sector companies, non-governmental organizations (NGOs), universities, foreign government's representations (Embassies), international organizations and metropolitan municipalities were contacted. The stakeholders were proposed according to their field of activities and through discussions held with AFD experts they were selected. These stakeholders are the primary actors/funders active on nature conservation and sustainable resource use on different fields, such as forestry, agriculture, nature conservation, climate change and fisheries.

As can be seen from the details of the projects above, in the past, the support given to projects directly focusing on species and sites conservation and research was bigger in Turkey. This period was pronounced during the second half 1990s up to 2010. Given the increasing economic development of Turkey during this period, a pronounced decline on the international funds arriving in Turkey did take place, especially for NGOs working on biodiversity conservation. For example under the Matra Programme of the Dutch Government, BBI-Matra Programme (International Biodiversity Policy Program) supported projects of app. 200-300,000 € in Turkey until 2010, and following that period, biodiversity was excluded from the priority areas for support. Furthermore the focus of the supports did change from threatened species and protected areas to sustainable management of natural resources and climate change more recently. During our interviews with the governmental representatives, the presence of adequate budget coming from the Central Government for their activities was mentioned. Yet, it appears that the expenses on the ground (especially on the local branches, namely the Provincial Directorates of the Ministries and the Forest Enterprise Directorates) can be lower than expected due to insufficient implementation capacity at the local level. The decrease of funding possibilities is unfortunately ongoing and increasing for the non-governmental organizations in Turkey. The big scale projects supported by international donors are mainly targeting governmental agencies rather than

to academia and NGOs. There are numerous examples of sound biodiversity conservation work carried out by NGOs with the support academia in Turkey (Zeydanlı et al. 2005, 2010; Eken et al. 2006; Özhatay et al. 2003; Lise et al. 2015; Ekim et al. 2000; Karaçetin and Welch, 2011). NGOs are also critical in dissemination of information gathered in the projects (e.g. about species distributions, effective management needs, status of habitats, etc.) and also in capacity building. Therefore the ongoing decrease of funds distributed to NGOs and limited participation in large-scale projects do significantly decrease the potential of NGOs to continue independent conservation work in Turkey. While the international and governmental funds to NGOs decrease, the interest of private sector to sustainable natural resource use does increase through Corporate Social Responsibility (CSR) Programmes supporting species protection, wise use of natural resources, afforestation activities and environmental education.

As a conclusion, there exists three ministries whose actions and responsibilities directly target natural resource management (forestry, agriculture, water resources, etc.), biodiversity conservation and protected areas in Turkey, namely the Ministry of Forestry and Water Affairs, the Ministry of Environment and Urbanization and the Ministry of Food, Agriculture and Livestock. Different general directorates under these ministries can be the targets of an investment programme in Turkey for sustainable natural resource management and biodiversity conservation. Furthermore, if a grant scheme will be given in Turkey, the non-governmental organizations presented in Section 2 of the report can be proper candidates to benefit from such a scheme at national, regional and/or local levels. The GEF-SGP model presented in this section of the report can be employed as a model for such a support scheme. Lastly, if convenient, private banks presented in Section 2 of the report can support the credit lines for SMEs in Turkey under the priority fields of support.

4. INVESTMENT NEEDS AND FUTURE AREAS OF INTERVENTION:

A total of 45 interviews were carried out with different stakeholders in the framework of the project, and a total of 64 experts were contacted between 30 July 2015 and 11 December 2015. 13 of the total 45 organizations were from Governmental Institutions, 9 from Private Sector Companies, 8 from Non-Governmental Organizations (NGOs), 5 from Universities, 2 from foreign governments, 6 from International Organizations and 2 from Metropolitan Municipalities (see Annex I for the organizations interviewed in this respect).

During the interviews, a set of questions was raised to stakeholders to gather their opinion on the priorities, problems/threats and priority fields of action at the national scale towards sustainable natural resource use and more specifically biodiversity protection. The questions listed below were adopted and/or changed accordingly with the field of activity of the organization interviewed:

Q1. What are the most important problems/topics/themes towards the sustainable natural resource use (including forestry, agriculture, tourism, etc.) and biodiversity protection in Turkey?

Q2. What would be the topics/programs that could be supported in the presence of a big scale finance in the biodiversity area?

Q3. What is the mission and vision of your organization towards sustainable natural resource use (including forestry, agriculture, tourism, etc.) and biodiversity protection?

Q4. What are projects/programs supported/realized by your organization on these topics?

Q5. What are the most successful projects/programs realized by your organization on these fields and their reasons?

Following the interviews with the sector representatives, further analysis and internal meeting(s) with AFD representatives; we have identified 8 priority topics which can be supported through different funding mechanisms (i.e. loans, technical assistance, pilot projects and grants).

Top Priorities Identified

1. Non-timber forest products:

Turkey is a country holding a significant richness in terms of non-timber forest products (NTFP). General Directorate of Forestry statistics show that 346 plant species are collected in the wild and traded in Turkey, of which 122 are exported. Yet, it is acknowledged that in comparison to the high potential of Turkey on NTFP, the awareness, effective management and partnerships among related stakeholders are very limited. In the last decade, non-timber forest products have gained more attention among the governmental institutions and the general public in Turkey. General Directorate of Forestry has established a special department entitled Non-timber Forest Products and Services Department specifically focused on this topic.

Since then, various action plans were developed and implemented for certain of the NTFP products (daphne, almond, gumtree, orchids, truff mushroom forest, honey production forest, etc.). Yet, given the big size of the country and the presence of 346 types of NTFP in Turkey, the capacity of the established unit, the investment on the topic and the number of studies focused on NTFP products remain very limited.

There is a need to establish an effective national system with the participation of all relevant stakeholders (governmental institutions, forest cooperatives, and private sector) on this topic. No study on the value chain of NTFP products has been carried out so far in Turkey. Such assessments can enable effective management of NTFP products at each level of the value chain.

GEF supported “Integrated Forest Management Project” which aims to demonstrate multiple benefits of the high conservation value forests in the Mediterranean forest region, to ensure the conservation of biodiversity and carbon storage in these areas, thus to promote integrated management approach for the management of Turkey’s forests. To achieve these targets one of the important actions is to support ecotourism activities (such as birdwatching, hiking and biking). Furthermore, in the project it is aimed to prepare value chain plans on 6 selected non-timber forest products at the pilot sites (to be identified).

The geographical coverage of this project remains small; the pilot areas of this project are Köyceğiz Forest Enterprise Directorate (FED), Gazipaşa FED, Gülnar FED, Pos FED, and Andırın FED. However, even small, this study sets a first example on sustainable planning of NTFP production, whose implementation would permit creating job opportunities for the local people.

In the absence of sufficient number of studies carried out on this topic, there is a significant need to focus on this topic and carry out further studies at local, regional or national scales. Through new management plans developed with this approach, both synergies between different stakeholders will be created and forest services (in terms of climate and biodiversity) will be strengthened. The experience gained in the GEF project can be upscaled to national level via further financing. The detail of the field of support is as follows:

- a. Establishing an effective system for non-timber forest products and services for supporting local development in forest villages via carrying out inventory and stock analysis for selected NTFPs.

Note: *The projects targeting non-timber forest products can also be effective for sustaining local communities in and around protected areas in Turkey, which can increase participation of local communities in active management and result in effective management of protected areas.*

2. Local development of villages and local communities:

Local development of villages has been supported by the governmental institutions (Ministry of Forestry and Water Affairs General Directorate of Forestry; Ministry of Food, Agriculture and Livestock), regional development agencies, and by NGOs who are supported by national and international funds. Regarding the coastal villages, our interviews concluded that the

support for local development of coastal villages was not sufficiently coordinated and it was not a topic of priority either. For this reason, the projects targeting local development of coastal villages can also be effective for sustaining local communities especially in and around marine protected areas in Turkey (see Figure 11).

In Turkey, the population of forest villages is around 7,332,000, representing 9.6% of the entire country and 35% of the rural population. This population is distributed around the country across 21,549 villages. They account for the poorest section of Turkish society and their agricultural activities are relatively limited due to the harsh geological conditions. Forest villages are eligible for financial and technical support from the Forest Village Relations Department (ORKÖY) within the General Directorate of Forestry. ORKÖY has been operating a grant/loan program since 1974 targeting forest villagers and under this framework it is running two grant/loan schemes: (i) social (non-profit projects, including grants, available only for individuals) and (ii) economic (typically 20% grant, available for both individuals and cooperatives). There is a need for enlarging the scope of these projects at the national scale by establishing new and innovative models to enhance the effectiveness of the supports. Renewable energy production by forest cooperatives, house heating systems with solar panels and ecotourism facilities can be seen as examples to such new and innovative models.

For the local development of both coastal and forest villages, the strategies and action plans developed by Metropolitan Municipalities can be an alternative resource in the medium to long term. The Metropolitan Municipalities have been restructured in 2012 in Turkey and now almost all of them have special departments specifically targeting local development (e.g. agriculture, ecotourism). These new departments are preparing their strategies and action plans and they do need technical assistance. The details of the field of support are as follows:

- a. Supporting projects towards sustainable development of villages by the sea (fishing, ecotourism, agriculture, pescaturismo);
- b. Establishing new and innovative models (house heating systems with solar panels, ecotourism facilities, etc.) for supporting forest villages by micro-credits.

3. Integrated river basin (watershed) management:

There are pilot studies towards developing integrated river basin management approach in Turkey. The by-law on the protection of river basins and preparation of river basin management plans and the presence of government aid agency supported projects on this topic are in line with this vision at the national scale. Yet the “integrated planning approach” remains as a rather new way of functioning for Turkey, where plans are majorly prepared in a rather unilateral way and expected to be implemented by all relevant stakeholders. Therefore there is a need to further support pilot studies in selected new river basins in Turkey, to raise the technical capacity on the topic, and to establish models where integrated management plans can be prepared with the active participation of relevant stakeholders. This approach can then be further upscaled at the national level.

The detail of the field of support is:

- a. Supporting integrated river basin management (multi-sectorial decision making, participation for governance models, climate change models, water budgets, water allocation, ecosystem based approach) at pilot basins with a national scale vision.

4. Ecosystem services:

Ecosystem services mapping and valuation have become one of the most important topics in nature conservation and sustainable natural resource management. Since the establishment of United Nations International Governmental Platform on Biodiversity and Ecosystem Services (IPBES), most of the international organizations integrate this topic into their strategies, action plans and project portfolios. International organizations like UNDP and the World Bank in Turkey have also supported small-scale projects on this topic and aim at developing and supporting larger scale projects for integrating ecosystem services in the decision support mechanisms. The detail of the field of support is as follows:

- a. Creating a decision support mechanism (including a common database) for integrating ecosystem services into development plans at national and regional scales; via economic valuation studies on ecosystem goods and services.

Note: *This topic was mentioned by a high number of sector representatives during the interviews, which had led to its inclusion in this priority list (i.e., governmental institutions, NGOs, universities, private sector, international organizations).*

5. Protected areas:

In Turkey, the total coverage of the protected areas network is 7.24% and according to the national biodiversity strategy and action plan, it is aimed increasing the overall coverage of the protected areas to 10%. However even this increased figure remains low in comparison to the *Natura 2000* network of protected areas representing 18% of the area of 27 Member States of the European Union. Especially when considering the high biodiversity Turkey holds in comparison to EU countries, the need to enhance the protected areas network become more evident. Furthermore, the existing protected areas network in Turkey is not covering all of the terrestrial ecosystems types, and there is a need to extend the protected areas network to cover steppe areas. Marine and coastal ecosystems are also underrepresented in the present network. Apart from these, the management decisions of the protected areas are mainly given by the central governmental institutions. This in turn limits the on the ground management power and technical capacity of the local branches. Lastly, there is a perception in the public that protection and sustainable development are mainly acting against one another in Turkey. There is thus a need to develop models where both biodiversity conservation and sustainable natural resource use can be carried out in harmony, creating livelihoods for local people. The details of the field of support are as follows:

- a. As a tool for operational and effective management plans of protected areas (including marine protected areas) creating trademarks of protected areas at regional level and developing relevant strategies, action plans on specific products and developing models towards decentralized management of protected areas.
- b. Establishing a national coastal and marine protected areas management and monitoring system (using SCP approach and delineating candidate *Natura 2000* sites), which includes management planning, developing governance models and management at site level, implementation, monitoring, and supporting local development.
- c. Developing models at candidate *Natura 2000* sites with nature conservation and sustainable development practices with the specific goal of demonstrating how development and conservation practices can be carried out in harmony.

6. Climate change, agriculture and biodiversity:

Agriculture, which is one of the primary sectors related with natural resource use, is highly sensitive to the climatic changes and extremes, as the success of production is mainly dependent on convenient environmental conditions during growing and harvesting periods. Thus there is a need to address the impact of climate change on agricultural practices and even at the product level. Furthermore, agricultural ecosystems do benefit directly from the goods and services provided by the ecosystems and the biodiversity they host. To sustain agricultural production, there is a need to address the benefits provided from nature and to manage the agricultural landscapes towards ensuring the sustainability of these services in the long term (e.g. climate smart agricultural practices).

Conserving and improving the ecosystem services used by agricultural sector will also enhance the adaptive capacity of agricultural production to climate change. Steppes in Anatolia are one of the birthplaces of agriculture in the world and agriculture has always been one of the major economic activities carried out in benefiting from these ecosystems. Overgrazing is one of the primary threats acting on these ecosystems and there is a need to supporting sustainable grazeland management in Turkey. Lastly, the agricultural (fisheries) and forestry cooperatives are the main actors in small-scale production in Turkey. Yet, they are not effectively represented in the relevant sectors, there is thus a need to support these establishments via increasing the operational power and impact. The details of the field of support are as follows:

- a. Supporting work on food security by both taking into account sustainability of natural resources and enhancing agricultural production (e.g. climate smart agriculture and conservation agriculture practices, integrated pest management).
- b. Supporting sustainable grazeland management (rehabilitation, infrastructure, climate change, biodiversity, management) planning and practices in different regions.

- c. Creating governance models and setting environmental, social and economic criteria for increasing the operational power and impact of agricultural (fisheries) and forestry cooperatives.
- d. Modelling the impact of climate change on different agricultural products (in terms of yield) and developing adaptation and mitigation measures on a product base.
- e. Supporting studies towards enhancing the organic content of soil (e.g. Biogas projects, restoration measures and sensitive agriculture practices).

Note: *The proposed fields of investments such as climate smart agriculture focuses not only on enhancing agricultural production but also aims at tackling climate change and protecting biodiversity and agricultural ecosystems, therefore with both direct and indirect impacts on biodiversity conservation.*

7. Municipalities:

In Turkey there are 30 metropolitan municipalities with populations over 750,000 inhabitants. The metropolitan municipalities have been restructured in 2012 in Turkey and now almost all of them have special departments/directorates for environmental management and control (or environmental protection) and for climate change, energy efficiency, sustainable urbanization and environmental issues. After the new Metropolitan Municipalities Law, all metropolitan municipalities established rural development (or food, agriculture and livestock) departments/directorates working on local development (agriculture, animal husbandry and ecotourism). Most of the Metropolitan Municipalities prioritized climate change action plans, agriculture and rural development as key targets in their strategic plans.

Istanbul Metropolitan Municipality has already started a project on preparation of Climate Change Strategy and Action Plan, which can be a model for other metropolitan municipalities. Investment will be required mainly for the implementation phase of such plans. The detail of the field of support is as follows:

- a. Preparing and implementing Climate Change Strategy and Action Plan for metropolitan municipalities.

Note: *Istanbul Metropolitan Municipality has already started such a project, which can be a model for other metropolitan municipalities. Investment will be required mainly for the implementation phase of such plans.*

8. Private Sector:

In Turkey, some of the banks and companies have their own Corporate Social Responsibility Programmes (CSR) on biodiversity conservation and sustainable natural resource. Some of the private and public banks have integrated sustainability into their operations and use specific environmental risk evaluation tools for the investments. They have special credits lines for SMEs on energy efficiency, renewable energy, and sustainable tourism and

agriculture sectors. However, during our interviews, the limited support for private sector on low carbon development tools was mentioned and it was recognised that there is a need for supporting private sector via banks or other credit lines for sustainable land management, conservation and restoration projects by creating low carbon development tools (green growth; including biodiversity and land degradation) and mechanisms at national and regional levels. For competing with international trademarks, private sector and NGOs offered to develop certificates for different types of goods, products and processes. The details of the field of support are as follows:

- a. Developing certificates following international standards for different type of goods, products and processes specific to Turkey with an environmental notion.
- b. Supporting private sector via banks or other credit lines for sustainable land management, conservation and restoration projects.
- c. Creating low carbon development tools (green growth; including biodiversity and land degradation) and mechanisms at national and regional levels.

Complementary Financial Models to Support Priorities

During the interviews held with the stakeholders, a general conclusion about for the different organizations in Turkey was that there is not an established capacity and experience towards loan management. Therefore it was proposed by different stakeholders to focus not only on loans as a means of investment in Turkey, but also to consider grants and technical assistance supports as complementary financial models. Some organizations especially detailed that rather than supports as loans to governmental institutions or municipalities, project-based supports should be given to ensure environmental standards being followed and effective participation of NGOs are secured. As detailed in the conclusion of Section 3 of the report, there is already limited recognition of the role of NGOs in Turkey and it would therefore be difficult to identify roles for NGOs in loans and other support mechanisms. Yet, the role of NGOs as partner organizations can be ensured by technical assistance and pilot projects. In this respect, some additional modalities are proposed as the means of supporting biodiversity sector in Turkey:

1. Technical Assistance + Projects

On many topics that were identified as priority in Turkey, there is a need to implement technical assistance in order to identify fields of action and to develop strategic frameworks as a first step. Such a model is implemented in Turkey by JICA on different topics. In this framework, Japanese experts visit Turkey for a period of time and work closely with Turkish experts to prepare detailed projects which lead to credit loans in the long term.

2. Pilot Projects

As detailed above, one conclusion about Turkey was the experience of organizations working on biodiversity conservation on project based financing. Therefore we propose to

use tools like FFEM to support priority topics in Turkey. Priorities towards marine and terrestrial protected areas can be supported effectively with this framework.

3. Grants for NGOs

The funding model of UNDP GEF-SGP distributed in the Datça and Bozburun Peninsula can be seen as a good model for a granting scheme in Turkey. The priority fields of action on biodiversity conservation and rural development were identified at the region scale in this example. Following this step, grants on the priority topics were disseminated to different organizations (local and national) with the main funding coming from Community Development and Knowledge Management for the Satoyama Initiative (COMDEKS).

References

- Abdul Malak, D., Livingstone, S.R., Pollard, D., Polidoro, B.A., Cuttelod, A., Bariche, M., Bilecenođlu, M., Carpenter, K.E., Collette, B.B., Francour, P., Goren, M., Kara, M.H., Massuti, E., Papaconstantinou, C. and Tunesi, L. 2011. Overview of the Conservation Status of the Marine Fishes of the Mediterranean Sea. Gland, Switzerland and Malaga, Spain: IUCN. vii + 61pp.
- Agardy, T., Alder, J. et al. 2005. Millennium Ecosystem Assessment. Current State & Trends Assessment. Chapter 19. Coastal Systems (PDF). pp. 513–549.
- Akkaraca Köse, M. 2012. Agricultural Policy Reforms and their implications on Rural Development: Turkey and the EU. Ankara Avrupa Çalışmaları Dergisi 11 (2): 75-98.
- Ambarlı, D. 2012. Factors Affecting Steppe Biodiversity in Central Part of Anatolian Diagonal and Their Use in Conservation. PhD Thesis, Middle East Technical University, Turkey.
- Ambarlı, D., Balkız, Ö., Zeydanlı, U.S., Karaçetin, E., Welch, H.J., Özüt, D., Turak, A.S., Sözen, M., Aslan, S., Vural, M., Ilgaz, Ç., Demirbaş Çağlayan, S., Lise, Y., Bilgin, C.C. *in prep.* An overview of biodiversity and conservation status of steppes and steppe forests of the Anatolia.
- Bann, C. & Başak, C. 2011a. Economic Analysis of Foça Special Environmental Protection Area. Ministry of Environment and Urbanization General Directorate of Natural Assets Protection (GDNAP). Turkey.
- Bann, C. & Başak, C. 2011b. Economic Analysis of Gökova Special Environmental Protection Area. Ministry of Environment and Urbanization General Directorate of Natural Assets Protection (GDNAP). Turkey.
- Bann, C. & Başak, C. 2013a. Economic Analysis of Köyceğiz-Dalyan Special Environmental Protection Area. Ministry of Environment and Urbanization General Directorate of Natural Assets Protection (GDNAP). Turkey.
- Bann, C. & Başak, C. 2013b. Economic Analysis of Fethiye-Gökcek Special Environmental Protection Area. Ministry of Environment and Urbanization General Directorate of Natural Assets Protection (GDNAP). Turkey.
- Bann, C. & Başak, C. 2013c. Economic Analysis of Ayvalık Adaları Nature Park. Ministry of Environment and Urbanization General Directorate of Natural Assets Protection (GDNAP). Turkey.
- Bann, C. & Başak, C. 2013d. Economic Analysis of Datça-Bozburun Special Environmental Protection Area. Ministry of Environment and Urbanization General Directorate of Natural Assets Protection (GDNAP). Turkey.
- Başak, E. 2003. Ecological and Socio-Economic Valuation of Tuz Gölü Specially Protected Area. Wageningen University, the Netherlands.

- Başak, E. 2009. Kaçkar Dağları Sürdürülebilir Orman Kullanımı ve Koruma Projesi, Ekosistem Değerleri Araştırması, Teknik Rapor, Turkey.
- Bilecenoğlu, M. 2010. Alien marine fishes of Turkey - an updated review. Fish Invasions of the Mediterranean Sea: Change and Renewal (D.Golani & B.Appelbaum-Golani, eds.), Pensoft Publishers, Sofia-Moscow, p. 189-217.
- Çevre ve Orman Bakanlığı. 2008. Ulusal Biyolojik Çeşitlilik Stratejisi ve Eylem Planı. Ankara, Turkey.
- Çolak, A.H., and Rotherham, I.D. 2006. A Review of the Forest Vegetation of Turkey: Its Status Past and Present and Its Future Conservation. *Biology and Environment: Proceedings of the Royal Irish Academy* 106B: 343-354.
- Davis, P.H. (eds.) 1965-1985. *Flora of Turkey and the East Aegean Islands Vols. 1-9* Edinburgh University Press.
- Dıvrak, B.B., Ayaş, C. and Iş, G. 2010. Drought trends and impacts on agricultural production and natural resources in the context of climate change. In López-Francos, A. *Economics of drought and drought preparedness in a climate change context. Options Mediterraneennes, Series A. Mediterranean Seminars 2010, Number 95*, Ciheam.
- Eken, G., Bozdoğan, M., İsfendiyaroğlu, S., Kılıç, D.T., and Lise, Y. (eds.) 2006. *Türkiye'nin Önemli Doğa Alanları*. Doğa Derneği, Ankara, Turkey.
- Ekim, T., Koyuncu, M., Vural, M., Duman, H., Aytaç, Z. and Adıgüzel, N. 2000. *Türkiye Bitkileri Kırmızı Kitabı. Türkiye Tabiatını Koruma Derneği ve Van 100. Yıl Üniversitesi*, ISBN-975-93611-0-8, Ankara, Turkey.
- Finlayson, C.M., D'Cruz, R., et al. 2005. *Millennium Ecosystem Assessment. Current State & Trends Assessment. Chapter 20. Inland Water Systems (PDF)*. pp. 551–583.
- Fricke, R., Bilecenoglu, M., Sari, H.M. 2007. Annotated checklist of fish and lamprey species of Turkey, including a Red List of threatened and declining species, *Stuttgarter Beitrage zur Naturkunde, Serie A (Biologie)* 706: 1-169.
- Garanti Bank. 2014. *Sustainability Report 2014*. İstanbul, Turkey.
- Gruber, B., Evans, D., Henle, K., Bauch, B., Schmeller, D.S., Dziock, F., Henry, P-Y., Szabolcs, L., Margules, C., Dormann, C.F. 2012. "Mind the gap!" – How well does *Natura 2000* cover species of European interest? *Nature Conservation* 3: 45–63.
- İnnal, D., Erk'akan, F. 2006. Effects of exotic and translocated fish species in the inland waters of Turkey. *Reviews in Fish Biology and Fisheries* 16:39–50.
- İş Bank. 2014. *Sustainability Report 2014*. İstanbul, Turkey.
- IUCN. 2012. *IUCN Red List Categories and Criteria: Version 3.1. Second edition*. Gland, Switzerland and Cambridge, UK: IUCN. iv + 32pp.

- Karaçetin, E., and Welch, H.J. 2011. Red Book of Butterflies in Turkey. Doğa Koruma Merkezi, Ankara, Turkey. Access: [www.dkm.org.tr]
- Karaçetin, E., Welch, H.J., Turak, A., Balkız, Ö., Gelch, G. 2011. Conservation Strategy for Butterflies in Turkey, Doğa Koruma Merkezi. Ankara, Turkey. Access: [www.dkm.org.tr]
- Kazgan, G. 2003. Tarım ve Gelişme (Agriculture and Development). Publications of İstanbul Bilgi University. p.364-390.
- Kence, A., and Bilgin, C.C. 1996. Türkiye Omurgalıları Listesi (eds: Prof.Dr. Savaş Mater ve Prof.Dr. Nurettin Meriç) 145–146 p. Nurol Matbaacılık, Ankara, Turkey.
- Kılıç, D.T. and Eken, G. 2004. Türkiye'nin Önemli Kuş Alanları. Doğa Derneği, Ankara, Turkey.
- Körner, C., Ohsawa, M. et al. 2005. Millennium Ecosystem Assessment. Current State & Trends Assessment. Chapter 24. Mountain Systems (PDF). pp. 681–716.
- Lise, Y., Çekiç, A.O., Argun, G. (eds). 2015. Doğal Öyküler. Türkiye Ormancılar Derneği, Ankara, Turkey.
- Margules, C.R., Pressey, R.L., 2000. Systematic conservation planning. Nature 405: 243–253.
- Millennium Ecosystem Assessment. 2005. Ecosystems and Human Well-being: Synthesis. Island Press, Washington, DC.
- Mittermeier, R.A., Robles Gil, P., Hoffmann, M., Pilgrim, J., Brooks, T., Mittermeier, C.G., Lamoreaux, J. and da Fonseca, G.A.V. (eds) 2004. Hotspots (revisited): Earth's Biologically Richest and Most Endangered Terrestrial Ecoregions. Conservation International, Cemex, Mexico.
- Orhaner, B., Doğan F. CSR Turkey Baseline Report. 2010. Corporate Social Responsibility Association of Turkey, Ankara, Turkey.
- Özhatay, N., Byfield, A. and Atay, S. 2003. Türkiye'nin Önemli Bitki Alanları / Important Plant Areas in Turkey. WWF-Türkiye (Doğal Hayatı Koruma Vakfı), İstanbul, Turkey.
- Öztürk, M. 2012. Agriculture, peasantry and poverty in Turkey in the neo-liberal age. Wageningen Academic Publishers.
- Pauly, D., Alder, J. et al. 2005. Millennium Ecosystem Assessment. Current State & Trends Assessment. Chapter 18. Marine Systems (PDF). pp. 477–511.
- Plan Bleu. 2014. Technical Report: Methods and tools for socio-economic assessment of goods and services provided by Mediterranean forest ecosystems.
- Redman, M., and Hemmami, M. 2008. Agri-Environment Handbook for Turkey. Buğday Association for Supporting Ecological Living.

- Safriel, U., Adeel, Z. et al. 2005. Millennium Ecosystem Assessment. Current State & Trends Assessment. Chapter 22. Dryland Systems (PDF). pp. 623–662.
- Şekercioğlu, Ç., Anderson, S., Akçay, E., Bilgin, R., Can, Ö.E., Semiz, G., Tavşanoğlu, Ç., Yokeş, M.B., Soyumert, A., İpekdağ, K., Sağlam, İ.K., Yücel, M. and Dalfes, H.N. 2011. Turkey's globally important biodiversity in crisis. *Biological Conservation* 144 (12): 2752–2769.
- Thomas, L. 2009. Report on the Sustainable Financing of Protected Areas in the Caucasus Region. WWF-Turkey, Istanbul.
- TSKB. 2014. TSKB Sustainability Report 2013-2014. Istanbul, Turkey.
- Turunç Peyzaj. 2012. Sultan Sazlığı Milli Parkı Ekosistem Hizmetlerinin Tespiti, Bedellendirilmesi (Biyokiyemlendirilmesi) ve Haritalanması Bileşeni Nihai Raporu. Turkey.
- United Nations Development Programme (UNDP) Turkey. 2009. Strengthening Protected Area Network of Turkey: Catalyzing Sustainability of Marine and Coastal Protected Areas.
- Welch, H.J. (ed.) 2004. GAP Biyolojik Çeşitlilik Araştırma Projesi 2001-2003 – Sonuç Raporu. DHKD (Türkiye Doğal Hayatı Koruma Derneği), İstanbul, Turkey.
- Wood, L.J., 2007. MPA Global: A Database of the World's Marine Protected Areas. Sea around Us Project, UNEP-WCMC and WWF. <<http://www.mpaglobal.org>>.
- Erbaş, B.Ç., Xie, J., Arıkan, E., Nemodova, V.I. 2015. Valuing Forest Products and Services in Turkey: A Pilot Study of Bolu Forest Area. World Bank Group.
- Yarar, M. and Magnin, G. 1997. Important Bird Areas in Turkey. DHKD Yayınları, İstanbul, Turkey.
- Yom-Tov, Y. 1988. Bird migration over Israel. In Yom-Tov, Y. & Tchernov, E. (eds) *The Zoogeography of Israel*: 497-514. Dordrecht: E. Junk
- Zeydanlı, U., Welch, H., Welch, G., Altıntaş, M., Domaç, A. 2005. Gap Analysis and Priority Conservation Area Selection for Mediterranean Turkey Technical Report, WWF-Turkey.
- Zeydanlı, U., Turak, A., Bilgin, C., Kınıkoğlu, Y., Yalçın, S., and Doğan, H. 2010. İklim Değişikliği ve Ormanlık: Modellerden Uygulamaya Adana Orman Bölge Müdürlüğü için Uyum Önerileri. Doğa Koruma Merkezi, Ankara, Turkey.

Annex I. List of stakeholders interviewed in the project

no	Sector	Name
1	Governmental Institutions	Ministry of Development
2	Governmental Institutions	Ministry of Environment and Urbanization General Directorate for Preservation of Natural Heritage
3	Governmental Institutions	Ministry of Environment and Urbanization General Directorate of Spatial Planning
4	Governmental Institutions	Ministry of Food, Agriculture and Livestock
5	Governmental Institutions	Ministry of Food, Agriculture and Livestock General Directorate of Agricultural Reform
6	Governmental Institutions	Ministry of Food, Agriculture and Livestock General Directorate of Agricultural Research and Policies
7	Governmental Institutions	Ministry of Food, Agriculture and Livestock General Directorate of Fisheries and Aquaculture
8	Governmental Institutions	Ministry of Forestry and Water Affairs General Directorate of Combating Desertification and Erosion
9	Governmental Institutions	Ministry of Forestry and Water Affairs General Directorate of Forestry
10	Governmental Institutions	Ministry of Forestry and Water Affairs General Directorate of Nature Protection and National Parks
11	Governmental Institutions	Ministry of Forestry and Water Affairs General Directorate of State Hydraulic Works
12	Governmental Institutions	Ministry of Forestry and Water Affairs General Directorate of Water Management
13	Governmental Institutions	Türkiye Kalkınma Bankası
14	Foreign Governments	British Embassy
15	Foreign Governments	Embassy of the United States of America
16	International Organizations	Delegation of the European Union to Turkey
17	International Organizations	European Investment Bank (EIB)
18	International Organizations	Food and Agriculture Organization of the United Nations
19	International Organizations	Japan International Cooperation Agency (JICA)
20	International Organizations	United Nations Development Programme
21	International Organizations	United Nations Development Programme Global Environment Fund Small Grants Program (UNDP GEF-SGP)
22	Metropolitan Municipalities	İstanbul Metropolitan Municipality
23	Metropolitan Municipalities	İzmir Metropolitan Municipality

24	Non-Governmental Organizations (NGOs)	Buğday Ekolojik Yaşamı Destekleme Derneği (Buğday Association)
25	Non-Governmental Organizations (NGOs)	Doğa Araştırmaları Derneği (Nature Research Society)
26	Non-Governmental Organizations (NGOs)	Doğa Derneği (BirdLife in Turkey)
27	Non-Governmental Organizations (NGOs)	Doğa Koruma Merkezi (Nature Conservation Centre)
28	Non-Governmental Organizations (NGOs)	Sualtı Araştırmaları Derneği (SAD; the Under Water Research Association)
29	Non-Governmental Organizations (NGOs)	The Turkish Foundation for Combating Soil Erosion, for Reforestation and the Protection of Natural Habitats (TEMA)
30	Non-Governmental Organizations (NGOs)	World Wide Fund for Nature (WWF- Turkey)
31	Non-Governmental Organizations (NGOs)	Yaşama Dair Vakıf (YADA Foundation)
32	Private Sector Companies	British Petroleum (BP) - Baku-Tbilisi-Ceyhan Pipeline Company Environmental Investment Programme
33	Private Sector Companies	Garanti Bank
34	Private Sector Companies	İş Bank
35	Private Sector Companies	Koç Holding
36	Private Sector Companies	The Coca-Cola Company
37	Private Sector Companies	The World Bank
38	Private Sector Companies	Türkiye Sınai Kalkınma Bankası A.Ş.
39	Private Sector Companies	Turkish Industry and Business Action (TÜSİAD)
40	Private Sector Companies	Unilever Foundation
41	Universities	Dokuz Eylül University
42	Universities	Gazi University
43	Universities	Karadeniz Technical University
44	Universities	Middle East Technical University
45	Universities	TOBB University