Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project

GCP/TUR/061/GFF

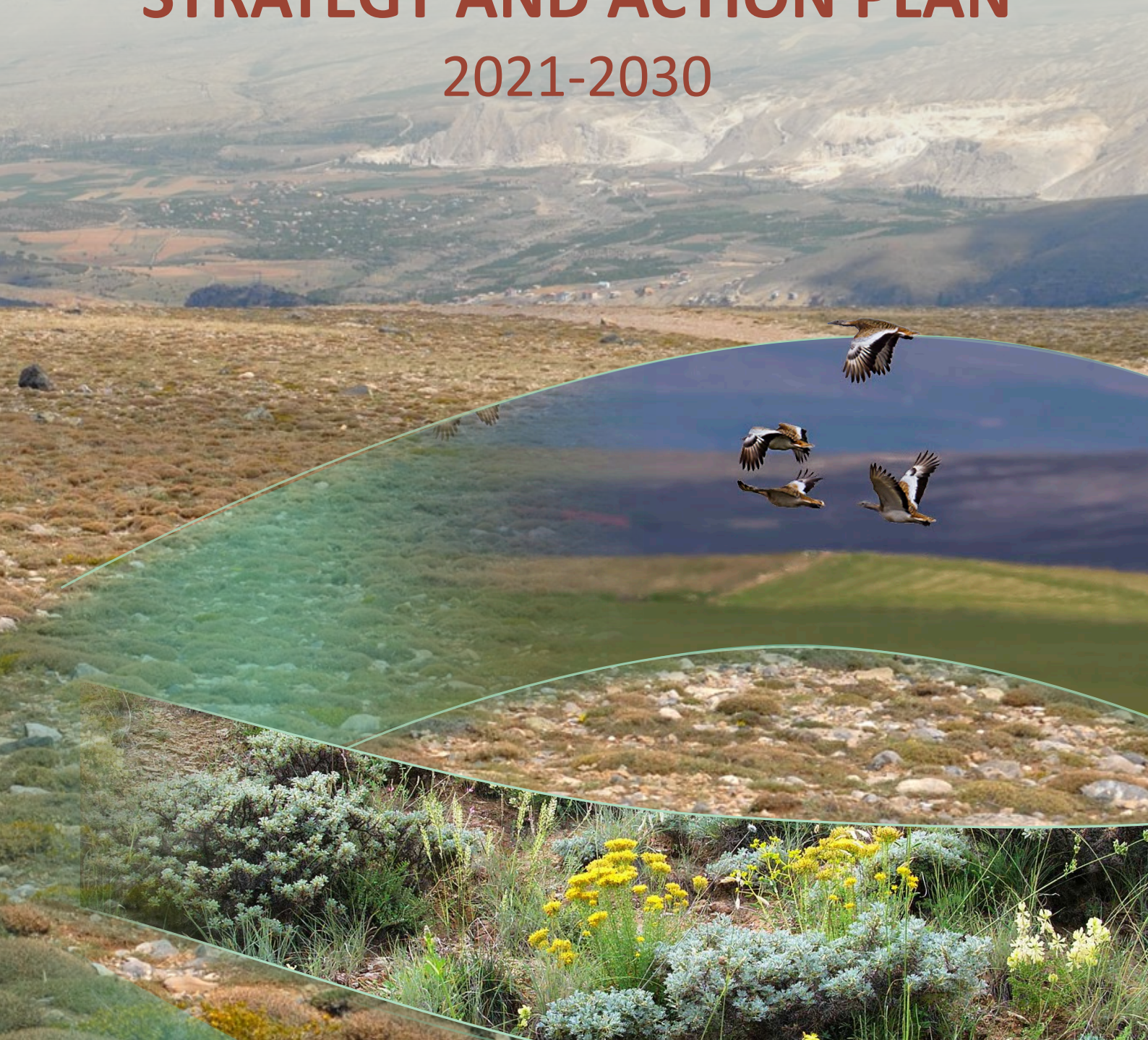# NATIONAL STEPPE CONSERVATION STRATEGY AND ACTION PLAN

2021-2030

Food and Agriculture Organization of the United Nations

Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project

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National Steppe Conservation Strategy and Action Plan was prepared by Doğa Koruma Merkezi (Nature Conservation Centre; DKM) within the scope of the Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project which is carried out collaboratively by the Food and Agriculture Organization of the United Nations (FAO) and the Ministry of Agriculture and Forestry General Directorate of Nature Conservation and National Parks (GDNCNP), General Directorate of Plant Production (GDPP), and General Directorate of Forestry (GDF) with the financial support of the Global Environment Facility (GEF).

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Abbreviations

AARI	Aegean Agricultural Research Institute
ARDSI	Agriculture and Rural Development Support Institution
BERN	Convention on the Conservation of European Wildlife and Natural Habitats
CAE	Chamber of Agricultural Engineers
CBD	Convention on Biological Diversity
CORINE	Coordination of Information on the Environment
CR	IUCN Red List Category "Critically Endangered"
DAP	Eastern Anatolia Project
DD	IUCN Red List Category "Data Deficient"
DKM	Nature Conservation Centre – Doğa Koruma Merkezi
DOKAP	Eastern Black Sea Project
DSD	Directorate of Strategy Development
DTP	Department of Training and Publication
EBA	Ecosystem Based Adaptation
EFALP	Environmentally Friendly Agricultural Land Protection Program
EIA	Environmental Impact Assessment
EVI	Enhanced Vegetation Index
GAP	South-Eastern Anatolia Project
GDAE	General Directorate of Agricultural Enterprises
GDAR	General Directorate of Agrarian Reform
GDARP	General Directorate of Agricultural Research and Policies
GDCDE	General Directorate of Combating Desertification and Erosion
GDDA	General Directorate for Development Agencies
GDEUFR	General Directorate for European Union and Foreign Relations
GDEM	General Directorate for Environmental Management
GDF	General Directorate of Forestry
GDFC	General Directorate of Food and Control
GDH	General Directorate for Highways
GDL	General Directorate of Livestock
GDM	General Directorate of Meteorology
GDNCNP	General Directorate of Nature Conservation and National Parks
GDPNH	General Directorate for Preservation of Natural Heritage
GDPP	General Directorate of Plant Production
GDSHW	General Directorate for State Hydraulic Works
GDSP	General Directorate of Spatial Planning
GDWM	General Directorate for Water Management
GEF	Global Environment Facility
GSP	Global Soil Partnership
FAO	Food and Agriculture Organization of the United Nations
IBA	Important Bird Area
IPA	Important Plant Area
IPARD	Instrument for Pre-Accession Assistance for Rural Development
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
IT PGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area

KOP	Konya Plains Project
LRAIS	Land Registry Archive Information System
MoAF	Ministry of Agriculture and Forestry
MoEU	Ministry of Environment and Urbanization
MoNE	Ministry of National Education
NatP	Natural Park
NBSAP	National Biodiversity Strategy and Action Plan
NE	IUCN Red List Category "Not Evaluated"
NDVI	Normalized Difference Vegetation Index
NGO	Non-Governmental Organization
NM	Natural Monument
NCCAP	Turkey's National Climate Change Action Plan
NCCASAP	Turkey's National Climate Change Adaptation Strategy and Action Plan
NOAA	National Oceanic and Atmospheric Administration
NP	National Park
NR	Nature Reserve
NSAPCD	National Strategy and Action Plan for Combating Desertification
NT	IUCN Red List Category "Near Threatened"
PBA	Prime Butterfly Area
RAMSAR	Convention on Wetlands of International Importance especially as Waterfowl Habitat
RIS	Rangeland Information System
SCP	Systematic Conservation Planning
SDGs	Sustainable Development Goals
SEPA	Special Environmental Protection Area
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TSR	Turkish State Railways
TUBITAK	Scientific and Technological Research Council of Turkey
TUREB	Union of Turkish Tourist Guides Chambers
TÜİK	Turkish Statistical Institute
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WR	Wildlife Reserve
WWF	World Wide Fund for Nature

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Preface

Anatolia is one of the regions of global importance in terms of biodiversity and the traditional knowledge it bears. It is a place where various land use activities linked to the oldest agricultural practices in the world are carried out and where various civilizations existed. Steppes are very important and vulnerable areas in this geography in terms of biodiversity and abundance of genetic resources. At present, there are large partially natural but generally semi-natural steppes abundant in species in the inlands of Anatolia. These steppes represent ecosystems that are extremely rich in biodiversity and serve highly as insurance for the conservation of natural assets and ensuring of food security for humanity. They make up important shelters for the wild relatives of many cultivated species today as well as extremely important habitats for many bird, butterfly, mammalian and reptile species. In other words, steppes are important gene centers that contribute to the achievement of food security for the future.

"The Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project" that is going on with the aims of mainstreaming the conservation of Turkey's steppe biodiversity into production landscapes and strengthening the conservation of steppe ecosystems is instrumental in highlighting the importance attached to the steppes.

The project is carried out collaboratively by the Food and Agriculture Organization of the United Nations (FAO) and the Ministry of Agriculture and Forestry General Directorate of Nature Conservation and National Parks (GDNCNP), General Directorate of Plant Production (GDPP), and General Directorate of Forestry (GDF) with the financial support of the Global Environment Facility (GEF).

This project along with the National Steppe Conservation Strategy shows the importance FAO and the Ministry of Agriculture and Forestry attach to the conservation of Turkey's rich and vulnerable steppe ecosystems, their sustainable and cooperative management and awareness-raising.

This Strategy is instrumental in contributing to the conservation of unique steppe assets possessed by Turkey at national level as well as fulfillment of international commitments such as those arising from the International Convention on Biological Diversity, Aichi Goals of Convention on Biological Diversity and Convention to Combat Desertification. It appears that there are hardly any policies or legal documents directly geared towards steppe ecosystems in Turkey, as opposed to the legal and administrative documents for the conservation and management of mountain-forests, wetlands, and coastal and marine ecosystems. Therefore, the National Steppe Conservation Strategy and Action Plan assumes special importance.

We would like to extend our sincere thanks to the Ministry of Agriculture and Forestry, General Directorate of Nature Conservation and National Parks, the General Directorate of Plant Production and the General Directorate of Forestry and the provincial units that care for steppe ecosystems, especially the Şanlıurfa units, which implemented a steppe-oriented project aiming at conservation of and strengthening sustainable management of Turkey's steppe ecosystems by considering the necessity of a national steppe conservation strategy, and the representatives of all institutions and organizations that supported the process, as well as to the Food and Agriculture Organization of the United Nations (FAO) and Doğa Koruma Merkezi (DKM) teams. The Ministry of Agriculture and Forestry and FAO exhibited an admirable example of cooperation with all the concerned parties in project implementation and strategy preparation. In particular, despite the COVID-19 pandemic that affected the whole world, continuity of work was ensured through the use of various alternative tools. We would like to extend our endless and sincere thanks to all who contributed to and supported this process.

Strategies and actions taking into account all sectors directly or indirectly involved in the conservation and management of steppe biodiversity and assets make up the foundation of this Strategy, which includes approaches and actions regarding the conservation of steppe biodiversity and its management in cooperation with all relevant stakeholders, and the Strategy is based on the fulfillment of commitments arising from international conventions, the National Biological Diversity Strategy and Action Plan and the National Strategy for Combating Desertification. Well aware of the value Turkey's steppe ecosystems hold, we wish the Strategy assists in the conservation and sustainable management of Turkey's natural heritage and assets.

The Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project

National Project Coordinator on behalf of the Project Team

Executive Summary

Steppes represent one of the most ecologically important and vulnerable ecosystems that are prevalent in the Eastern, Southeastern and Central Anatolia Regions of Turkey. Within the Irano-Turanian phytogeography, steppes of Turkey, of all-natural ecosystems, are considered the most threatened ecosystems because of human activities. Some of the threats are destruction and irreversible loss of steppe habitats. With the increase in mechanization in agricultural activities, destruction in all steppes, mainly the lowland steppes, has been intensified. Steppe areas are lost also because of mining activities, energy investments, afforestation practices in unsuitable areas and urbanization pressure. One of the critical factors contributing to the destruction of the natural vegetation of the steppes is overgrazing. Today, steppes remain in stony or rocky areas as islets that contain remains of natural vegetation between agricultural fields and grazing areas. Other factors that threaten the steppe ecosystems and the species that they host include illegal hunting, species trafficking, illegal collection of plants and intensive agricultural activities. The lack of awareness about the importance of steppe species, and effective conservation efforts for these species being limited to protected areas are two other factors that negatively affect the biodiversity of steppes. In recent years, works geared towards mitigation of these threats and conservation and sustainable management of the steppes have become more crucial.

Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project is a leading project that is in progress with the aims of mainstreaming the conservation of Turkey's steppe biodiversity into production landscapes and strengthening the conservation of steppe ecosystems. One of the important activities within the component of "Enabling environment established for the effective conservation of steppe biodiversity across large landscapes" is the participatory preparation of a national conservation strategy and action plan for steppes.

Steppes represent a formation of mostly xerophytic species, which dry out in summer and go dormant in winter, dominated by annual or perennial Poaceae and other herbaceous species and perennial cushion-forming shrubs. The word "steppe", "bozkır" in Turkish, is a Russian word for the pastures to the south of Eastern Europe, which later made its way to Turkish language. Steppes account for one of the main biogeographical groups in the world within the grasslands. Grasslands and steppes that cover 40% of the global surface area, excluding Antarctica and Greenland, are among the most important ecosystems for the continuity of life. **The Steppe Vegetation** section of the Strategy and Action Plan provides an overview of the distribution and classification of steppes in the world. This section also covers detailed evaluations of the distribution of steppes across the country by Doğa Koruma Merkezi. In this context, it is found that the potential zone of steppe and steppe forest ecosystems in Turkey (areas that form sparse or closed forests within the ecological regions dominated by steppes) spans an area of approximately 33.5 million hectares. According to the analyses, there are approximately 17 million ha of steppes and 552,334 ha of steppe forest within the potential steppe zone. The plant diversity of the steppes accounts for an important portion of the floristic richness of Anatolia. Steppes are also significant habitats for many birds, insects, and mammalian, amphibian, and reptile species

The Anatolian steppes have been the center of civilizations throughout history. Before the settled life, the foundations of places of worship such as Göbeklitepe were laid in upper Mesopotamia. Similarly, Anatolia represents the beginning of agriculture and transition to settled life. It has also become the "Gene Center" of agricultural and forage crops such as lentils (*Lens* spp.), chickpeas (*Cicer* spp.), and vetches (*Vicia* spp.), along with wheat (*Triticum* spp.) and barley (*Hordeum* spp.) species. Steppes undertake numerous ecological functions such as creating genetic reserves with the biodiversity they contain and serving as insurance for cultivated plants. In addition, they accommodate vitally important ecosystems in terms of development of animal husbandry, preservation of soil and water and erosion control. **The Steppes of Turkey** section of the Strategy and Action Plan provides information, analyses, and assessments regarding the distribution of the steppes of Turkey, different approaches used in the classification of steppes, floristic characteristics, plant and animal diversity of Turkey's steppes, interactions between people and steppes throughout the history of Anatolia, and the use and state of the rangelands in Turkey.

In Turkey, there exists no steppe definition in the legislation unlike forests and wetlands. On the other hand, many policy documents and pieces of legislation contain supporting elements related to the conservation and sustainable management of steppe ecosystems, including natural steppes, meadows, rangelands and steppes with trees. Although there is no single institutional structure responsible for the conservation and management of steppes, there are capacities and various mechanisms available within different institutions. **The Legal Framework and Institutional Structure Related to Steppes** section of the Strategy and Action Plan reveals the current situation with an assessment of existing policies, legislation and mechanisms as well as institutional structures and capacities at national level related to the conservation and sustainable management of steppe.

Of all steppes of Turkey (about 17.5 million ha), 42% is situated in Central Anatolia, 36% in Eastern Anatolia, 14% in Southeastern Anatolia, 5% in the Black Sea Region, 2% in the Mediterranean Region and 1% in the Aegean Region. In the potential steppe and steppe forest zone of Turkey, there are 75 protected areas holding a legal status, and approximately 4% of 33.5 million hectares is under protection. However, of steppes and steppe forests (about 17.5 million ha) within the potential steppe zone, only 2.9% is legally protected. **The Spatial Assessments Regarding the Steppes of Turkey** section of the Strategy and Action Plan presents spatial assessments on the current situation with respect to the conservation of steppes specifically as protected areas and important biodiversity areas, with attention given to the distribution of steppes and steppe forests by geographical regions and provinces, and threats to and pressures on the steppes of Turkey.

A conservation strategy and action plan adopted by all stakeholders for the conservation and sustainable management of steppes of Turkey is of great importance. The overall aim of the National Steppe Conservation Strategy is to ensure the sociological, ecological and economic sustainability of the steppes of Turkey. In accordance with this overall aim, 4 strategic goals and, under these, 12 strategic objectives were identified taking into account policies, legislation, and mechanisms related to the steppes in line with the current situation of the steppes of Turkey and spatial assessments of the steppes. The first of these strategic goals is to create an enabling environment and develop policies to ensure the effective management of the steppes. The second and third strategic goals are to protect the steppe biodiversity and improve the use of resources in the steppes within the framework of the sustainability principle. The fourth strategic goal is to improve the livelihoods of the local people who benefit from the steppes. **National Steppe Conservation Strategy** and **National Steppe Conservation Action Plan** sections present the strategic goals and objectives for the conservation of the steppes as well as an action plan to achieve these goals and objectives. The action plan includes short, medium, and long-term activities defined for the 2021-2030 period in order to achieve the goals and objectives of the Strategy.

Defining a governance mechanism and monitoring system for the effective implementation, monitoring, and evaluation of the National Steppe Conservation Strategy and Action Plan is one of the most essential requirements. The issue of governance and cooperation gains more importance as steppe conservation and management related tasks are undertaken by different institutions. It is recommended that the main coordination of a National Steppe Conservation Strategy and Action Plan be made by the National Biodiversity Coordination Board in order to ensure coordination and cooperation between governmental organizations and stakeholders. This way, secretariat services of the National Coordination Board are undertaken by the General Directorate of Nature Conservation and National Parks. In addition, a Sub-Committee for the Execution of the Convention on the National Basis under the National Coordination Board, whose tasks include the implementation of the National Biodiversity Strategy and Action Plan, becomes the main body responsible for the coordinated implementation of the Steppe Conservation Strategy and Action Plan. **The Governance Model** and **Monitoring System** sections of the Strategy and Action Plan provide the framework for key approaches and necessary structuring and functioning for coordinated and collaborative implementation, supervision, and monitoring of the Strategy.

The National Steppe Conservation Strategy and Action Plan is considered a leading document in the conservation and sustainable management of steppes at national level with effective governance and cooperation. In addition, it contributes to the fulfillment of international commitments such as those arising from the Aichi Biodiversity Targets of the Convention on Biological Diversity, the United Nations Convention to Combat Desertification and Sustainable Development Goals.

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About the Project

Steppes represent one of Turkey's most important ecosystems in ecological, economic and social terms. Turkey's steppe ecosystems include natural steppes, meadows and rangelands, and cover approximately 33.5 million hectares of land in the country. Steppe ecosystems are prevalent in the Eastern, Southeastern and Central Anatolia Regions, as well as in the high mountains of the Aegean and Mediterranean Regions. Turkey's steppe ecosystems are faced with threats of loss and destruction of habitats, excessive use of production areas and climate change.

In this context, an important project has been carried out in Turkey; the Food and Agriculture Organization of the United Nations (FAO) and the Ministry of Agriculture and Forestry (MoAF) General Directorate of Nature Conservation and National Parks (GDNCNP), General Directorate of Plant Production (GDPP) and General Directorate of Forestry (GDF) are implementing the Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project (GCP/TUR/061/GFF) with the financial support of the Global Environment Facility (GEF). The project aims to improve the conservation of Turkey's steppe ecosystems through effective management of protected areas and mainstreaming steppe biodiversity conservation into production landscapes. The components of the project, which is implemented in three different sites in Şanlıurfa consist of the following:

1) Effectiveness of protected area system increased to conserve steppe biodiversity

2) Steppe biodiversity conservation mainstreamed into production landscapes

3) Enabling environment established for the effective conservation of steppe biodiversity across large landscapes.

Doğa Koruma Merkezi (DKM) is responsible for the 3rd component, namely "Enabling environment established for the effective conservation of steppe biodiversity across large landscapes".

Within the component of establishing enabling environment for the effective conservation of steppe biodiversity across large landscapes, one of the implemented tasks is the preparation of a conservation strategy and action plan at national scale in a participatory way. Preparatory work started in 2019 for development of this strategy and action plan. In this process, a participatory approach was adopted and applied. The first meetings in this context were held face-to-face, but various other meetings and workshops, which were originally planned in face-to-face form, were held in digital environment as an alternative due to the Covid-19 pandemic, and the flow of information was maintained in a healthy manner. Besides, effective and active engagement of all relevant institutions and organizations was ensured.

In this context, 2 face-to-face workshops and 2 online meetings were held, and views were exchanged between experts from all relevant governmental organizations, academia, local schools, private sector and civil society. Members of the Project's National Steppe Conservation Working Group and Scientific Advisory Group also contributed to this process. In this context, 225 experts, including the authors of the Strategy, contributed to the process. Of the contributing experts, 156 were from public institutions (69%), 32 were academics (14%), 26 were from NGOs (12%), 10 from international organizations (4%) and 1 from the private sector (1%). As to the gender breakdown, 72% were male and 28% female. Most of the experts who contributed to the process were from Ankara (40%) and Şanlıurfa (38%), and the rest were from the following 27 provinces: Adana, Adıyaman, Afyon, Aksaray, Antalya, Burdur, Çankırı, Diyarbakır, Düzce, Erzurum, Gaziantep, Istanbul, Karaman, Kars, Kayseri, Kilis, Kırşehir, Konya, Malatya, Mardin, Muş, Ordu, Osmaniye, Samsun, Sivas, Şırnak and Van.

In addition, an online survey, which could provide a wider and more effective opportunity of participation, was prepared as an alternative to face-to-face meetings in order to collect information and contribution from the experts of different institutions and organizations, and the survey was distributed to relevant institutions and persons through FAO and the Ministry of Agriculture and Forestry. A total of 399 experts from national and local public institutions, central and provincial organizations, academia, NGOs, and international organizations contributed to this survey. This way, expert evaluations and suggestions related to (i) threats, (ii) conservation proposals and (iii) situation assessments (SWOT Analysis) sections of the Strategy and Action Plan were collected. In line with the results of the survey, sections on the threats to the steppes on a national scale, conservation, and situation assessment were approved by the participants and finalized. At the same time, a regional assessment of the threats to the steppes and the conservation proposals was made. These inputs and recommendations were incorporated into the National Steppe Conservation Strategy and Action Plan. Finally, the framework of Steppe Terminology was prepared by Doğa Koruma Merkezi experts with the aim of creating a glossary specific to the steppes as a part of the Strategy. The steppe terminology study was delivered to the volunteering experts (30) in the Independent Consultants Group, FAO and MoAF Project team (20) using online tools, and the contributions and opinions of these experts were received. In the process, a Glossary for Steppes consisting of 42 terms was created and included, as an important part, in the Strategy. The present document is the National Steppe Conservation Strategy and Action Plan, prepared in line with the support and opinions of many different stakeholders, as a result of nearly a year-long intense efforts and contributions.

1. The Steppe Vegetation

Steppes can be defined as natural areas dominated by xerophytic herbaceous and woody plants. Steppes represent a formation of mostly xerophytic species, which dry out in summer and go dormant in winter, dominated by annual or perennial Poaceae and other herbaceous species and perennial cushion-forming shrubs. The term "steppe", "bozkır" in Turkish, is a Russian word for the pastures to the south of Eastern Europe, which later made its way to Turkish language. In North America, the equivalent of steppe vegetation is "prairie". Moreover, steppes in South America are called "pampas" (Ketenoğlu et al., 2014).

Trees can also be seen in steppes, but these are either ancient trees or drought-tolerant small trees. The main reason why steppes are dominated by annual or perennial herbaceous plants with only a few trees is the low precipitation. When the precipitation falls below 500-600 mm per year, there would not be many trees around. On the other hand, precipitation is not the only reason why there are herbaceous plants instead of trees in steppes. Various climatic events, recurrent natural fires, avalanches or floods, and sometimes the soil and bedrock structure can be the reason. Nevertheless, a common feature of the vast steppes from one end of Europe to the east of China is low precipitation.

1.1. Steppes in the World

Steppes are included in the grasslands as one of the main biogeographic groups in the world. Grasslands are also divided into two groups according to their region (Figure 1; Olson et al., 2001):

1. **Tropical grasslands:** These areas are warm the whole year, with no cold winters. They have two different seasons, namely dry and rainy. The savanna ecosystems in Africa can be given as an example. In these savannas, the world's most remarkable species such as elephants, giraffes, rhinoceroses, zebras, lions, cheetahs and hyenas exist.

2. **Temperate grasslands:** These areas are dominated by shorter grasses and receive approximately 250-600 mm of precipitation per year. For example, Ankara falls in this group with 400 mm of annual precipitation. There are two separate periods in temperate grasslands, namely dormancy and growth. During the dormant period, plant growth stops because of cold. In this group that covers steppes, there are very few of the remarkable animals seen in the savannas. Animals such as gazelles, wild sheep, wolves and jackals can be found in these areas.
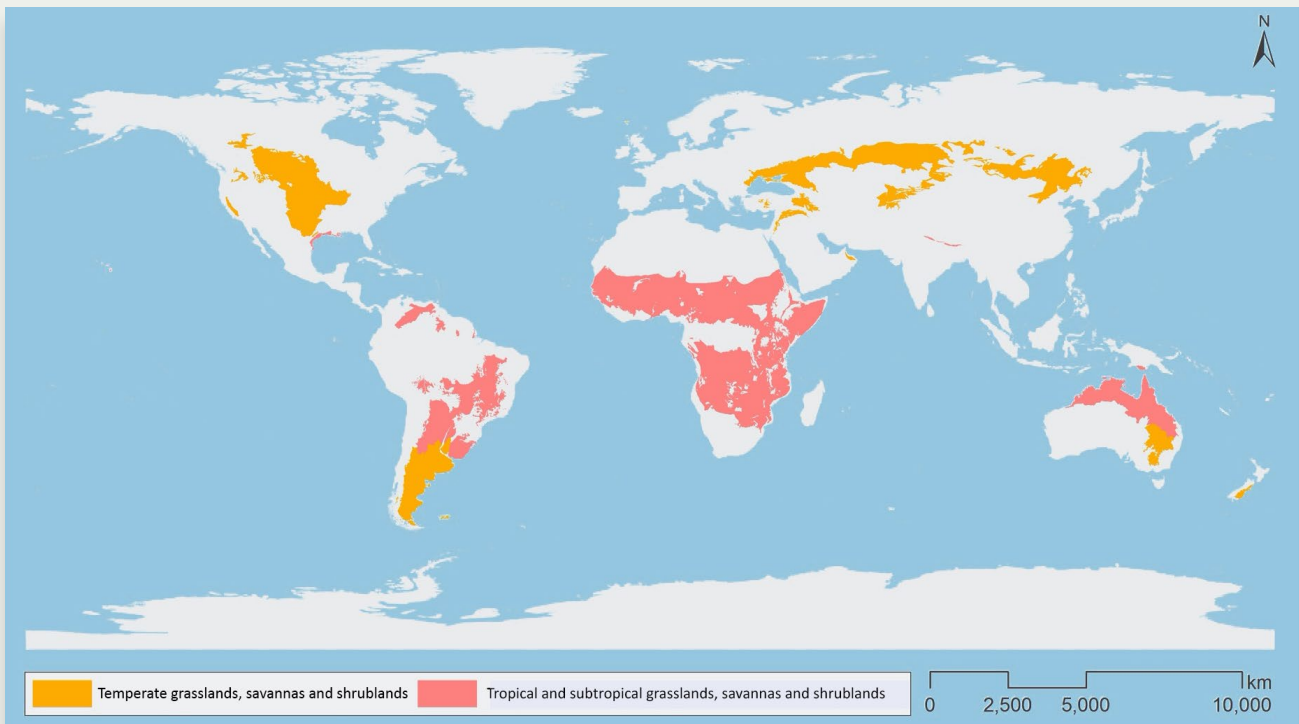
Figure 1. Tropical and temperate grasslands in the world (Data Source: WWF International Terrestrial ecoregions spatial data; Olson et al., 2001).

Steppes are generally considered to be insignificant because of their monotonous appearance. However, meadows and steppes covering 40% of the global surface area, excluding Antarctica and Greenland, represent some of the most important ecosystems for the continuity of life because of the following reasons:

- Food staples such as wheat, barley and oats, which are consumed throughout the world, are grown in the steppes.

- Animal husbandry largely relies on steppes. In this regard, approximately 1 billion people living below the poverty line make a living from sheep breeding and cattle-raising. As much as 27% of milk production and 23% of meat production come from the steppes.

- Besides, 33% of the carbon in the earth is sequestrated in the steppes.

- Steppes represent the most important ecosystem in terms of herbivorous mammals, butterflies and plants.

Similarly, steppes account for ecosystems that accommodate the most diverse plant species and highest number of endemic species in Turkey. Although the common belief is that forests, scrublands, and wetlands are richer, almost 80% of endemic plant species in Turkey are distributed in the steppes. Contrary to popular belief, steppes host a diversity of plant species.

2. The Steppes of Turkey

Steppes are arid ecosystems dominated by grasses, where trees and shrubs are rare and precipitation is low. Steppes in Turkey represent the dominant vegetation in the Southeastern, Eastern and Central Anatolia Regions. All steppes of Turkey are in the Irano-Turanian phytogeography. There are 35 phytogeographical regions in the world (Takhtajan, 1986). The Irano-Turanian phytogeographical region extends from the Central Asian steppes in the east to the Inner Aegean in the west; the northern part of Syria, the parts of Iran outside the Caspian coast, the South Russian deserts, Karakorum, Mongolia and Tibet Plateau also fall within this phytogeographical region. Takhtajan (1986) divides steppes of turkey into Central Anatolia, Eastern Anatolia-Iran and Mesopotamian steppes.

Steppes of the Holarctic phytogeographical region, which is a colder region, are located in the south of Eastern Europe, Ukraine and Russia. The word "steppe", which is "bozkır" in Turkish, is originally a Russian word.

Steppes of Turkey are defined as steppes of anthropogenic character commonly, in other words, they are believed to have emerged as a result of human-induced destruction of forest cover (Louis, 1939; Walter, 1956; Ketenoğlu et al., 2014). The steppes in the Salt Lake Basin and the Southeastern Anatolian plain are regarded as steppes of non-anthropogenic character. On the other hand, according to Schiechtl et al. (1965), Mayer and Aksoy (1986) and Çolak and Rotherman (2006), steppes of non-anthropogenic character include the inner parts of Thrace, a larger area around the Salt Lake Basin, the Malatya Plain, the Iğdır Plain and the Bulanık Plain.

The period when the steppes began to undergo a great change because of human influence is thought to be around 3000 BC. In addition to destruction for agriculture, animal husbandry, shelter and settlement, it can be assumed that the great wars in Anatolia played an important role in this change. Strabon suggests that the wars of the Hittites (2000-1200 BC), the wars between the Persians and the Greeks, the invasion of Anatolia by the Romans had an important role in the transformation of vegetation of Central Anatolia into steppes (63/64 BC – 24 AD). According to Strabo, Roman commanders burned a lot of forests when occupying Anatolia. According to Herodotus, the passage of Xerxes II with his army of 1 million people through Anatolia to invade Greece had a great effect. Likewise, the huge army that Alexander the Great formed for the Indian expedition passed through by trampling the Anatolian lands and plants.

During this time, the forest communities dominated by black pine (*Pinus nigra*) in Central Anatolia started to disappear or deteriorate (Çetik and Vural, 1979). According to Akman (1974), destroyed black pine (*Pinus nigra*) forests left their place to a sparse forest cover consisting of shrubs such as downy oak (*Quercus pubescens*), hawthorn (*Crataegus* spp.), wild pear tree (*Pyrus elaeagnifolia*), and juniper (*Juniperus excelsa* and *J. oxycedrus.*) and eventually to steppes with further degradation (Figure 2). Oak communities in the Central Anatolia Region cover an area over 493,000 hectares.

Figure 2. The distribution of downy oaks in the Central Anatolia Region was used as an indicator in the past to determine the distribution of forests and steppes of anthropogenic character. DKMProduced using the stand data of the General Directorate of Forestry (GDF). Source: DKM, ODTÜ'nün Doğası, 2021).
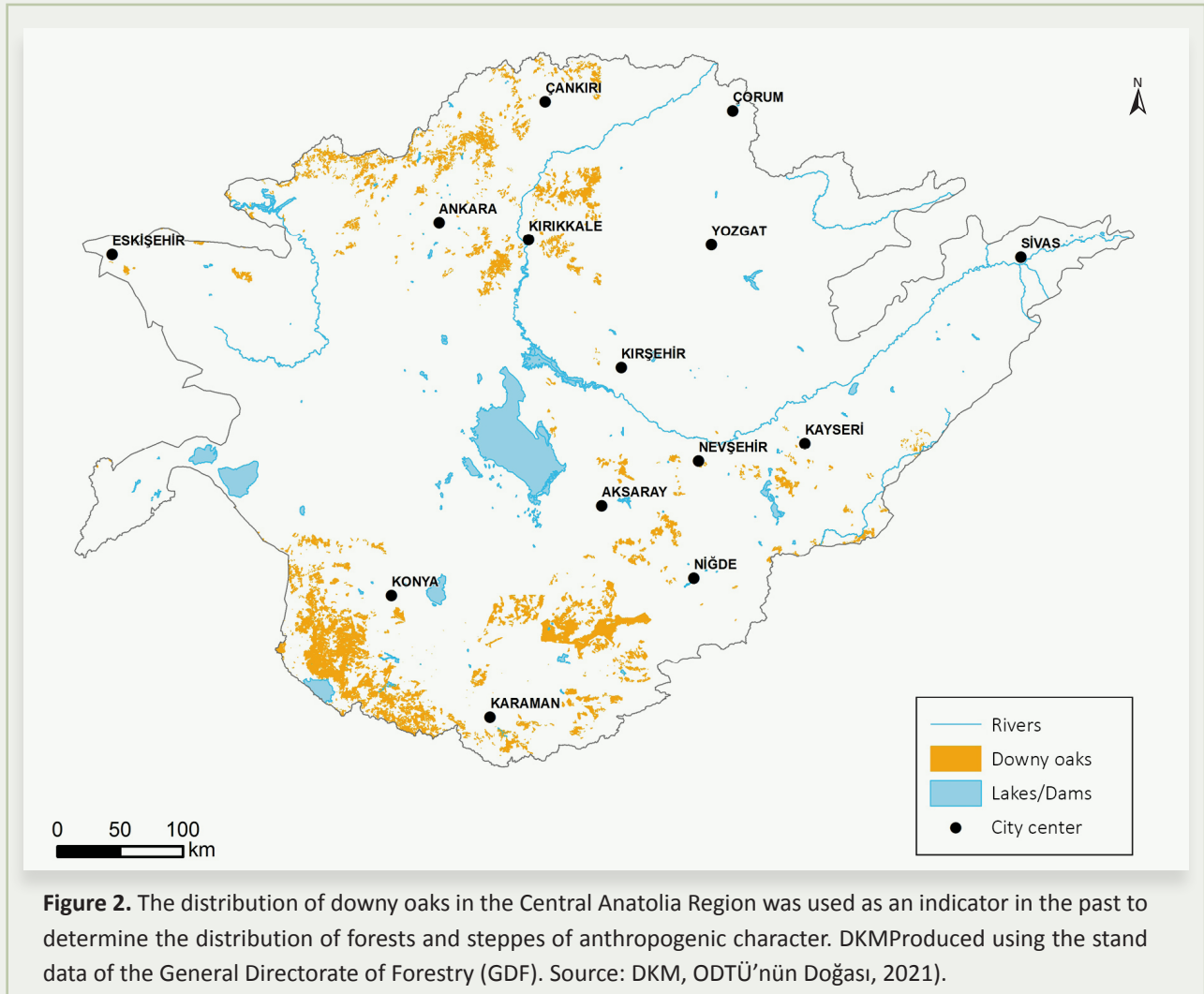
In order to explain the distribution of existing forest and steppe cover, it is necessary to investigate the long-term climate change. It is assumed that the Würmian Ice Age played an important role in the formation of vast forests covering the arid parts of Anatolia, especially the Central Anatolian steppes. During the Würmian Ice Age, which is believed to have happened 115,000 to 11,700 years ago, average temperatures presumably dropped by 10 °C. The cold semi-desert formations in Central Anatolia (Ray and Adams, 2001) started to leave their place to forests during the warm-up period as a result of the end of the ice age approximately 10,000 years ago (Bottema et al., 1993). Approximately 5,000 years ago is indicated as the period when the process of forest destruction and steppe formation accelerated (Louis, 1939).

It should also be remembered that the decrease in the regenerative capacity of the forests due to droughts experienced in Anatolia also played a role in the aforementioned forest destruction. Considering the current climatic conditions, we can assume that it will not be possible to grow forests naturally in many areas classified as steppes of anthropogenic character (Figure 3, Figure 4).

Current studies and findings show that natural steppes spread over a wider area than previous assumptions indicated. In order to distinguish steppes of anthropogenic character from natural steppes, it is necessary to look at the distribution of forest remnants, individual oaks (*Quercus* spp.) and black pines (*Pinus nigra*), especially in Central Anatolia, and uncover the effects of drought experienced in the last 5,000-6,000 years on the regenerative capacity of forests. While many scientific studies have examined the Anatolian steppes and human interaction, Hikmet Birand's book titled "Alıç Ağacı ile Sohbetler (Conversations with the Hawthorn Tree)" (1968) has a special place as it handles this subject in a very wide framework and explains it in a flowing, chatty style.
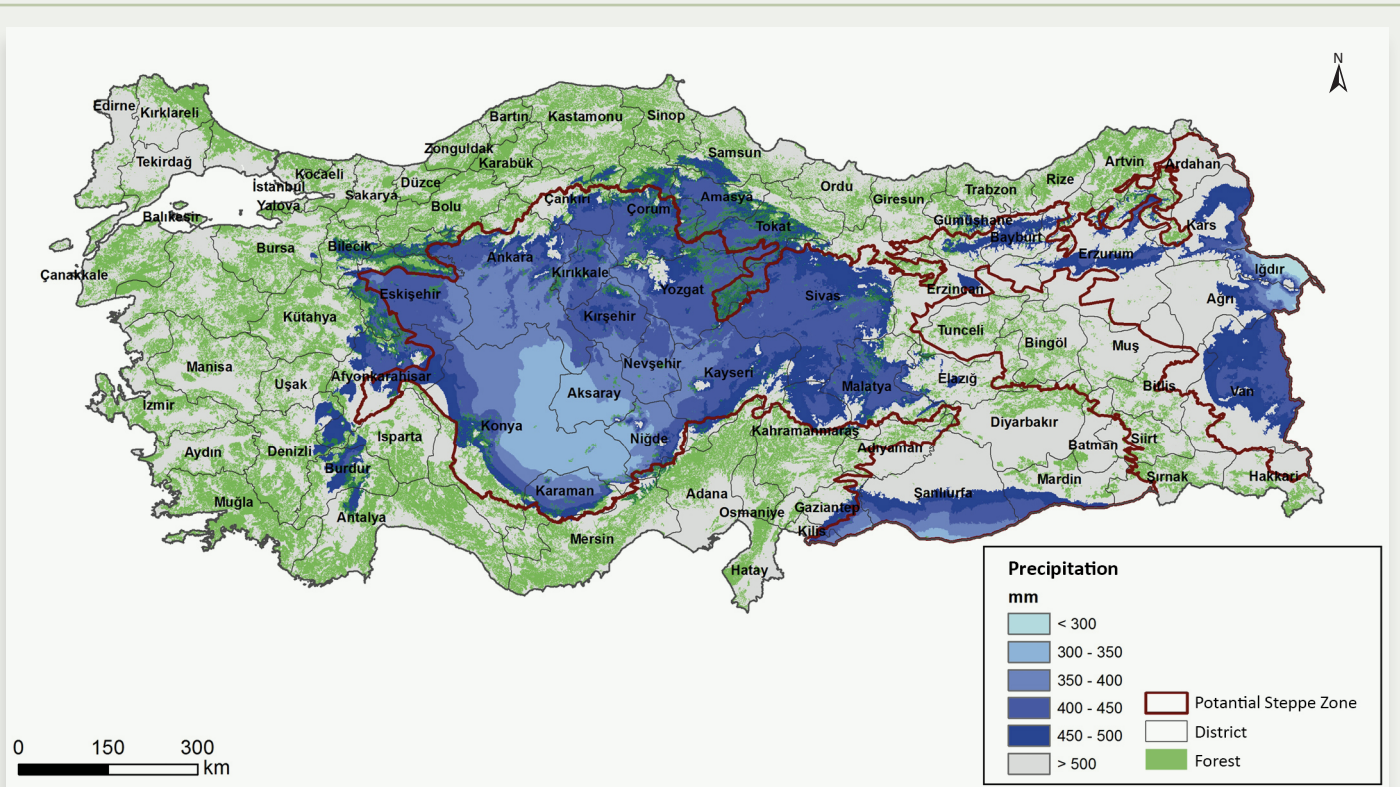
Figure 3. Current distribution of forests and potential steppe zone[1] in relation to precipitation. (The map is produced using the stand data of the General Directorate of Forestry (GDF) and Worldclim data[2]. Source: DKM, ODTÜ'nün Doğası , 2021).
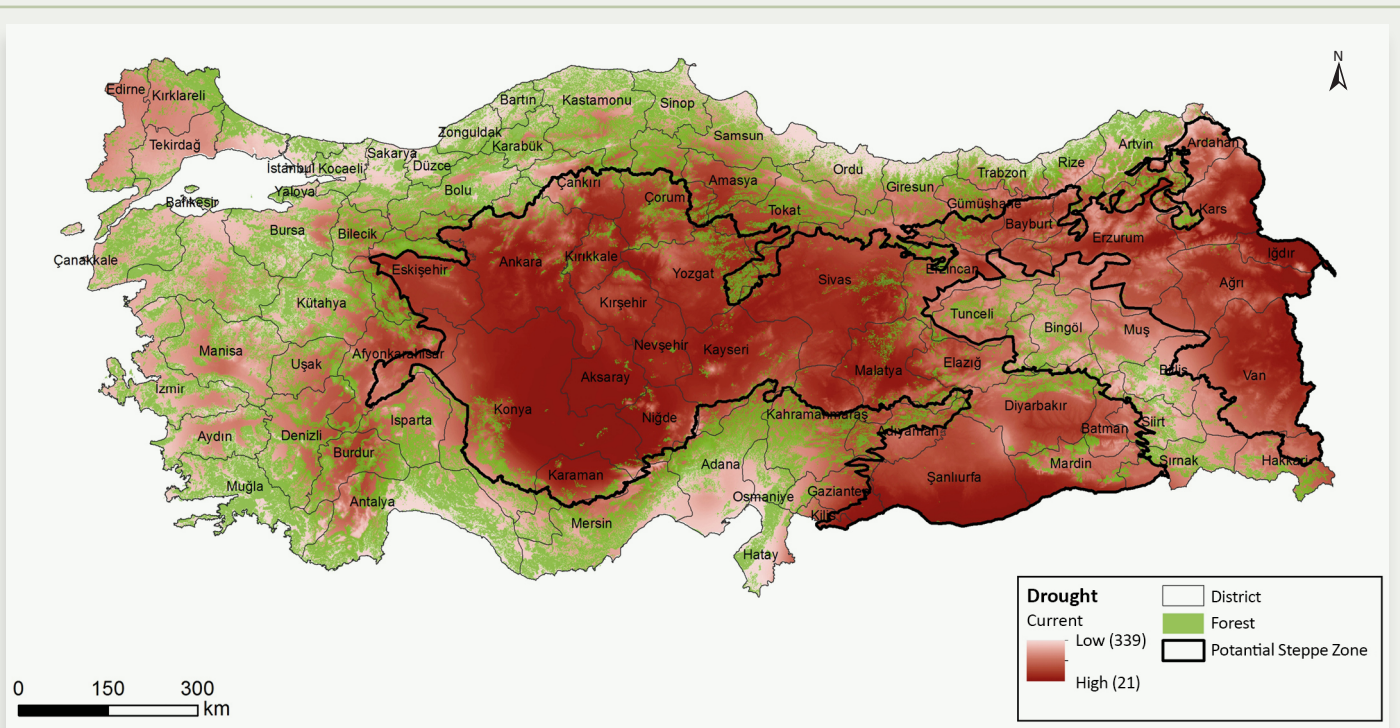
Figure 4. Today's drought values, distribution of forests and potential steppe zone on scale of the Emberger Aridity Indexi[3,4] The map is produced using the stand data of the General Directorate of Forestry (GDF) and Worldclim data. Source: DKM, ODTÜ'nün Doğası, 2021).

1. *See Section 2.2 for details on the potential steppe zone.*
2. *https://www.worldclim.org/bioclim*
3. *In the figure, the aridity value is given on scale of the Emberger Aridity Index, and low values of the index indicate high drought, while high values indicate low drought.*
4. *See Section 2.2 for details on the potential steppe zone.*

2.1.   Classification of the Steppes of Turkey

Different approaches are used to identify and classify the steppes of Turkey. Commonly used classifications are as follows:

1. By Topographic Characteristics:

The steppe vegetation in Turkey varies depending on the elevation.

- Lowland Steppes: Steppes in flatlands or slightly sloping lands
- Low Mountain Steppes: Steppes on slopes generally at 800 to 1,600 meters of altitude
- High Mountain Steppes: Steppes generally above 1,600 meters of altitude

2. By Physiognomic Characteristics:

- Malacophyll Steppes: Steppes dominated by broad- and soft-leaved herbaceous plants (Walter, 1956).
- Grass (Poaceae-Gramineae) Steppes: Steppes dominated by the Poaceae.
- Tragacanth Steppes: Steppes dominated by cushion-forming shrubs such as milkvetch (*Astragalus*) and prickly thrift (*Acantholimon*).

3. By Geographical Distribution:

- The Central Anatolian Steppes
- The Eastern Anatolian Steppes
- The Southeastern Anatolian Steppes

Box 1. The Steppes of Turkey According to the Geographical Regions

We think that providing information about the floristic features of Turkey's steppes according to geographical regions is the easiest method to follow.

Steppes of Central Anatolia:

Grasses such as *Bromus tomentollus*, *Festuca valeiaca*, *Rostraria cristata*, *Stipa lessingiana* and *Stipa holosericea* and cushion-forming chamaephytes such as *Astragalus angustifolius*, *Astragalus microcephalus* and *Onobrychis cornuta* are dominant species in the Central Anatolian Steppes. In the more arid southern regions, especially in Salt Lake Basin, the plants from the families of Amaranthaceae and Plumbaginaceae are common. Mediterranean and Irano-Turanian endemics are seen abundantly in Central Anatolia. Especially in Çankırı, Sivas and Ankara (between Beypazarı-Sivrihisar), there are many narrow-ranged endemics in gypsum-bearing and marly soils. Moreover, the steppes in the Mediterranean mountains above 1,500 m are also rich in species specific to the Mediterranean phytogeographical region. Species that can be listed for this region are *Festuca cyllenica, Helictotrichon pubescens, Marrubium astracanicum, Marrubium lutescens, Tanacetum armenum, Helicrysum plicatum, Chaaecytisus ericarpus, Astragalus angustifolius, Astragalus microcephalus,* and *Onobrychis cornuta*.

The first scientist to research the halophilic steppes in the Central Anatolia Region was Birand (1961). His research led to the finding of the following important species in the halophilic steppes: *Champhorosma monspeliaca, Pucinellia convulata, Petrosimonia brachiata, Aeluropus littoralis, Halimione verrucifera* and *Frankenia hirsuta*.

The steppe communities of the Central Anatolia belong to the *Astragalo microcephali - Brometea tomentelli* (Quézel, 1973) class, *Onobrychido armenea - Thymetalia leucostomi* (Akman et al., 1985) order in terms of plant sociology.

Steppes of Eastern Anatolia:

Average altitude in Eastern Anatolia is over 1,400 m. Steppes in this region, where precipitation is slightly higher than in Central Anatolia, are used extensively for animal husbandry. Animal husbandry, which relies on seasonal migration in large herds, is also an important economic activity for the country.

The main species in the high mountain steppes of the Eastern Anatolia are as follows: F*estuca cyllenica*, *Agrostris stolonifera*, *Alopecurua aequalis*, *Bromus pumilio*, *Dactylis glomerata*, *Gaudiniopsis macra*, *Phleum pratense*, *Poa nemoralis*, *Poa bulbosa*, *Poa pratensis Acanthus dioscoridis*, *Aster alpinus*, *Helichrysum plicatum*, *Myosotis lithospermifolia*, *Sibbaldia parviflora*, *Alchemilla caucasica*, *Anthemis cretica*, *Draba brunifolia*, *Gentiana verna*, and *Minuartia anatolica*.

In the slightly sloping and bottom lands where groundwater is higher and alluvial-hydromorph soil is dominant are mountain meadows dominated by mesophilous species, with a coverage approaching 100%. The main species of these habitats can be listed as follows: *Anthemis cretica, Bromus japonicus, Centaurea depressa, Dianthus calocephalus, Eromopoa persica, Erigeron acris, Filago arvensis, Filipendula vulgaris, Gladiolus atroviolaceus, Lotus corniculatus, Medicago x varia, Onobrychis stenostachya, Papaver orientale, Papaver rhoeas, Phleum montanum, Rumex acetosa, Rumex alpinus, Sanguisorba minor, Salvia verticillata, Trifolium repens, Trifolium pratense* and *Vicia cracca*.

The steppe communities of the Eastern Anatolia belong to the *Astragalo microcephali – Brometea tomentelli* (Quézel, 1973) class, *Festuca oreophilae - Veronicetella orientalis* (Hamzaoğlu, 2006) order in terms of plant sociology.

Steppes of Southeastern Anatolia:

The steppes of Southeastern Anatolia Region, also called the lowland steppes, are located in the north-end of the Syrian-Middle East Desert. This region has hosted many civilizations since the Sumerians and is the place where agriculture was first practiced, which in a way facilitated destruction of vegetation to a great extent. Artemisia steppes, which are normally expected to cover large areas, are largely damaged in this region. A significant part of the steppes of the region was converted into agricultural fields, and the species composition of the remaining parts was altered by overgrazing. The main species of these steppes can be listed as follows: *Gundelia tournefortii, Eryngium campestre, Centaurea virgata, Scutellaria orientalis, Phlomis kurdica, Aegilops triuncialis, Avena sterilis, Xeranthemum annuum*, and *Phlomis bruguieri*.

The steppe communities of the Southeastern Anatolia belong to the *Astragalo microcephali - Brometea tomentelli* (Quézel, 1973) class in terms of plant sociology.

Box 2. Classifying and Mapping Steppes

According to the basic physiognomic classification systems used in mapping studies (di Gregorio, 2005; UNESCO, 1973; Grossman, 1998), the dominant cover should consist of herbaceous plants and the ratio of trees or shrubs should be less than 20-25% in the steppes that fall within the "Herbaceous Vegetation" class. Many steppe areas of Turkey, except ones in the Southeastern Anatolia and Salt Lake Basin, are intertwined with trees and shrubs. This type of area is called steppes with trees. In addition, areas with sparse or closed forests in ecological regions dominated by steppes are called steppe forests. Tree cover in these areas is more than 20-25%.
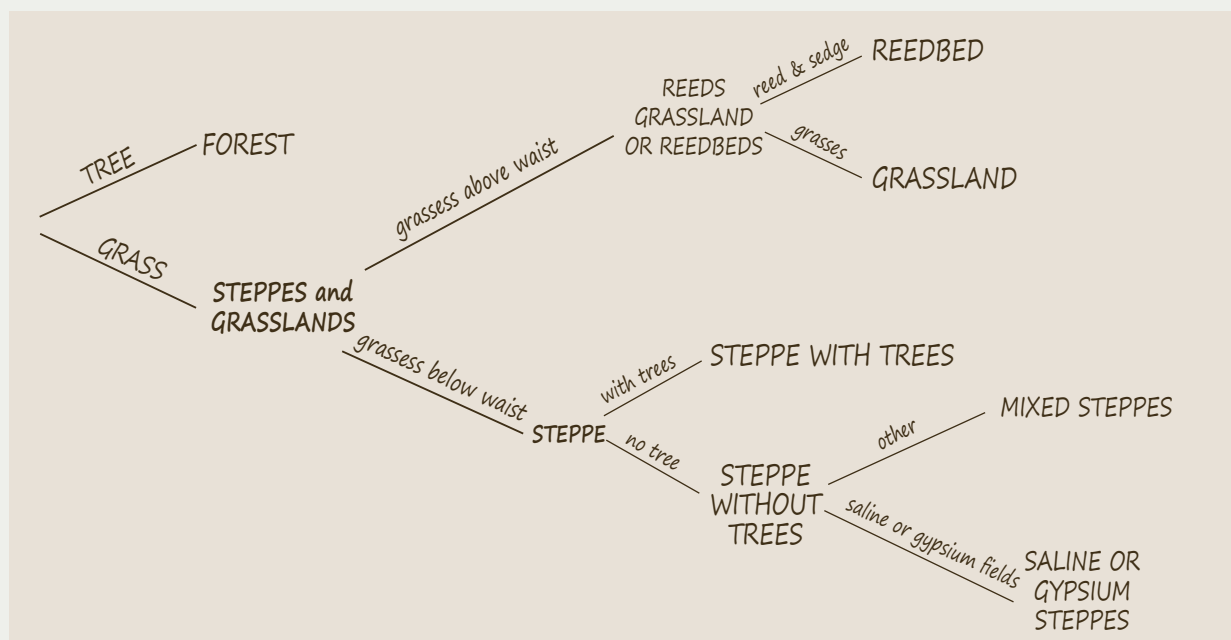
Figure 5. A simple diagram showing the classification of steppes according to their physiognomic and other characteristics. (Source: DKM, ODTÜ'nün Doğası, 2021).

Box 3. What is the difference between steppe, meadow and rangeland?

Steppe	Meadow	Rangeland
- A type of land cover	- A type of land cover	- A type of land use
- Dominated by xerophytic, short herbaceous plants	- Dominated by moist, tall herbaceous plants	- Allocated for grazing animals and benefiting from its grasses and used for these purposes since ancient times
- Distributed in the temperate zone	- Distributed in the temperate zone	
- 300-500 mm of annual average precipitation	- Higher precipitation than in steppes	
- Low levels of groundwater	- High levels of groundwater	
- Few woody plants	- Few woody plants	

2.2. Determining the Borders of Turkey's Steppe Zone

Two separate studies were carried out recently with a view to determining the steppe borders of Turkey (the region covering areas which can house steppe ecosystems):

1. The study coordinated by Doğa Koruma Merkezi (Figure 6; Ambarlı et al., 2016),

2. The study carried out within the scope of "Agricultural Implications for Ecosystem-Based Adaptation to Climate Change in Steppe Ecosystems Project" conducted cooperatively by the Ministry of Agriculture and Forestry and the Food and Agriculture Organization of the United Nations between the years 2017-2019 (Figure 7).

The potential steppe zones (the region covering areas which can house steppe ecosystems) on which these two studies were based differed from each other. In the first study, the Anatolian Biogeography boundaries, one of the biogeographic regions produced by the European Environment Agency (2015), were taken as a basis in determining the region. In addition, drought classes (Dufour-Dror and Ertaş, 2004) were included. As for the indicators, tree species such as Turkish pine (*Pinus brutia*), Scots pine (*Pinus sylvestris*), beech (*Fagus orientalis*), spruce (*Picea orientalis*), cedar (*Cedrus libani*) and fir (*Abies* spp.), with a distribution that did not overlap with the steppes, were used. Areas where these species were distributed were not included in the region. In this stage, the stand data of the General Directorate of Forestry were used. Finally, considering the distribution of herbaceous plant species, which are the indicators of the steppe ecosystems, the region with steppes and steppe forests was determined. According to this study, the potential steppe zone covers approximately 33.5 million hectares of land.

The second study was carried out within the scope of the 'Ecosystem-Based Adaptation (EBA) to Climate Change in Steppe Ecosystems Project' conducted jointly by the Ministry of Agriculture and Forestry and the Food and Agriculture Organization of the United Nations between the years of 2017 and 2019 (Avcıoğlu-Çokçalışkan et al., 2018). In this project, stand data, surface temperature, drought index, soil structure, elevation, geological formations, vegetation indices such as NDVI (Normalized Difference Vegetation Index) and EVI (Enhanced Vegetation Index) were used to determine the potential steppe zone. Using the potential vegetation approach in Turkey (with the help of variables such as climate, soil, and topography), the region covering areas that could house steppe ecosystems was determined. According to this study, the potential steppe zone spans approximately 32 million ha.

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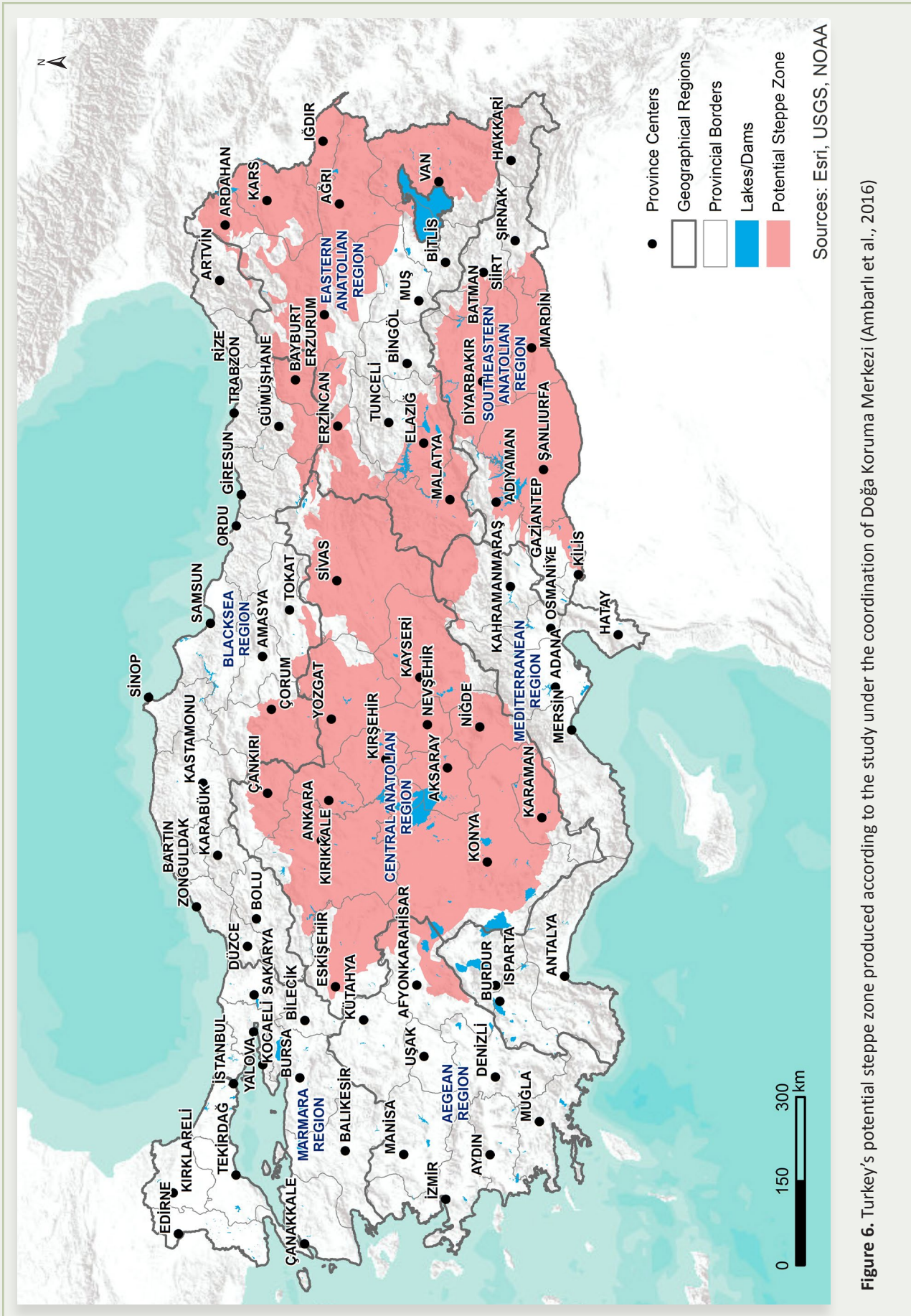
Figure 6. Turkey's potential steppe zone produced according to the study under the coordination of Doğa Koruma Merkezi (Ambarlı et al., 2016)
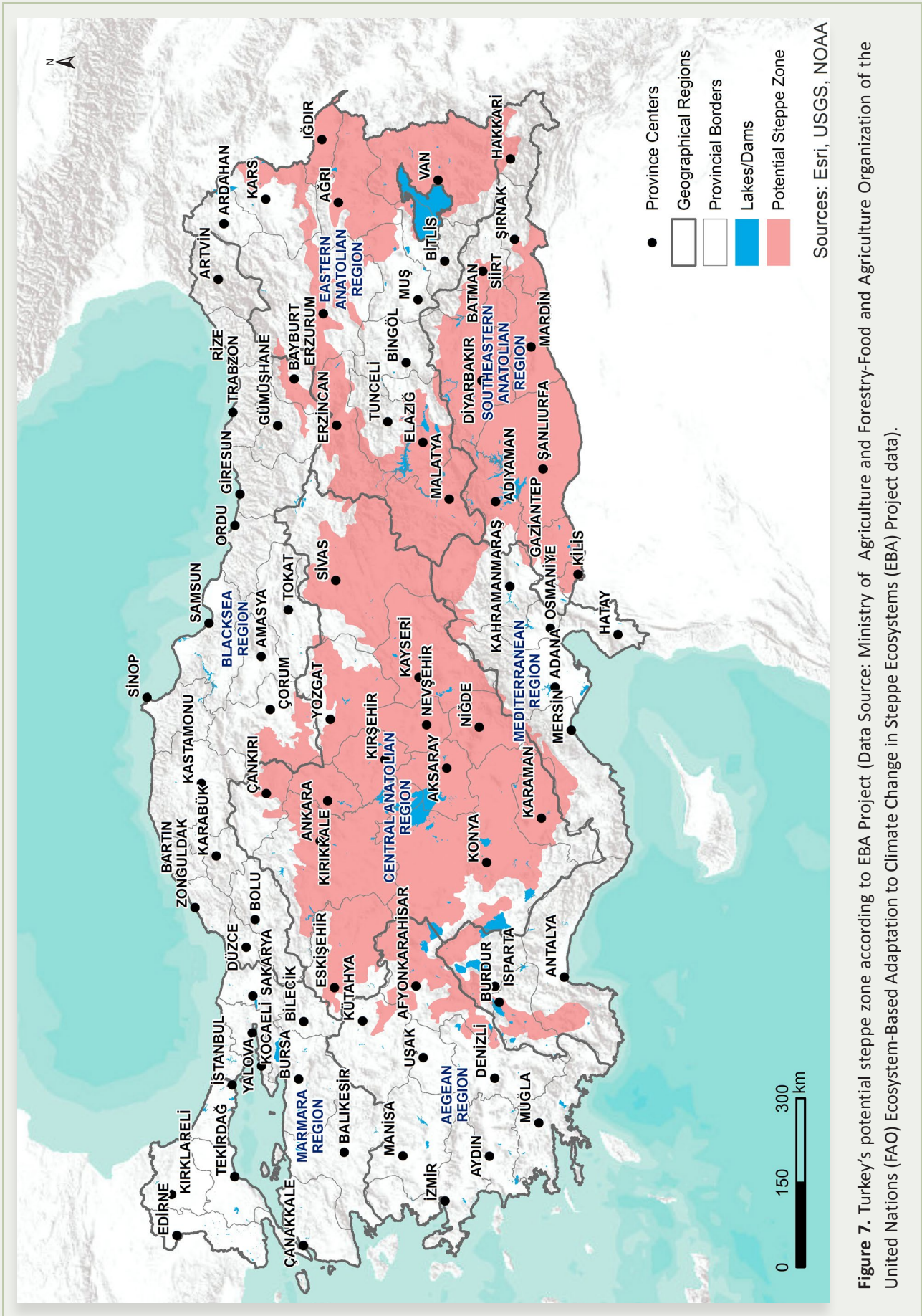
Figure 7. Turkey's potential steppe zone according to EBA Project (Data Source: Ministry of Agriculture and Forestry-Food and Agriculture Organization of the United Nations (FAO) Ecosystem-Based Adaptation to Climate Change in Steppe Ecosystems (EBA) Project data).

2.3. Mapping of the Steppes of Turkey

Distribution of steppe areas and steppe forests of Turkey was reconsidered by Doğa Koruma Merkezi as part of Strategy development efforts in 2020. Accordingly, necessary information was produced based on the steppe map produced under the coordination of Doğa Koruma Merkezi (Ambarlı et al., 2016). The zone potentially containing steppes and steppe forests (areas that form sparse or closed forests in ecological regions dominated by steppes) ecosystems spanned an area of approximately 33.5 million hectares in Turkey. This zone is also the region covering areas which can host steppe ecosystems according to the potential vegetation approach (with the help of variables such as climate, soil, and topography). In this region, there are many different land use types (e.g., agricultural fields, settlements, mines, etc.) in addition to natural steppe areas and steppe forests. In the study by Doğa Koruma Merkezi conducted to determine the distribution of the existing steppe areas and steppe forests in this region, steppe areas were considered to be areas where herbaceous vegetation was dominant and tree and shrub cover was low; additionally, steppe forests were considered to be transitional zones representing transition from areas dominated by forests to steppes.

For determining the current distribution of steppe and steppe forest ecosystems, forest management plans, stand data, registered rangeland data (May 2020 data) and CORINE Land Use and Land Cover data (2018) were used as a basis. The definition of a rangeland refers to a land use type, but rangelands are also steppe areas when it comes to vegetation classification (especially in Eastern Anatolia, Southeastern Anatolia and Central Anatolia Regions). Therefore, rangeland data were also used when evaluating the steppe vegetation within the potential steppe zone.

Sentinel-2 satellite images (images between the years of 2016-2019) were used in cases where forest management plan data were not up-to-date for some Forest Management Directorates (since the management plans are made every 10 years) or it was not possible to directly determine the steppe areas from some composite land classes in CORINE 2018 data. From satellite images, NDVI[5] (Normalized Difference Vegetation Index, Rouse et al., 1974), an indicator of healthy vegetation and efficient photosynthesis function, was calculated. Table 1 gives details about the base data used to determine steppe and steppe forest ecosystems. According to these analyses, there are approximately 17 million ha of steppe area and 552,334 ha of steppe forest within the potential steppe zone. Spatial representation of steppe areas and steppe forests is given in Figure 8.

Table 1. Data used to determine the steppe and steppe forest ecosystems and their details

Steppes	Proprietary Rangelands
	Rangelands (231), Natural Meadows (321), Bare Rocks (332), Sparse Vegetation Areas (333) in CORINE (2018) Land Use and Land Cover data
	Areas with NDVI value <0.3 among Agricultural Fields Mixed with Natural Vegetation (243) in CORINE (2018) Land Use and Land Cover data
	Areas with NDVI value <0.5 among Plant Change Areas (324) in CORINE (2018) Land Use and Land Cover data
	Areas with NDVI value <0.5 among forests with cover less than 40% according to forest management plans
Steppe Forests	Forest polygons with cover higher than 40% (2 and 3 closed) according to forest management plans
	Areas with NDVI value >0.5 among forests with cover less than 40% according to forest management plans
	Areas with NDVI value >0.5 among Plant Change Areas (324) and Sclerophyll Vegetation areas (323) in CORINE (2018) Land Use and Land Cover data

5. The images between May 1 and June 15, 2016-2017-2018 and 2019 of Sentinel-2 satellite images were filtered and passed through a cloud filter. For each image, the NDVI Index and the index mean were calculated:
$NDVI=((B8-B4))/((B8+B4))$
B4: Red band   B8: Near-infrared band
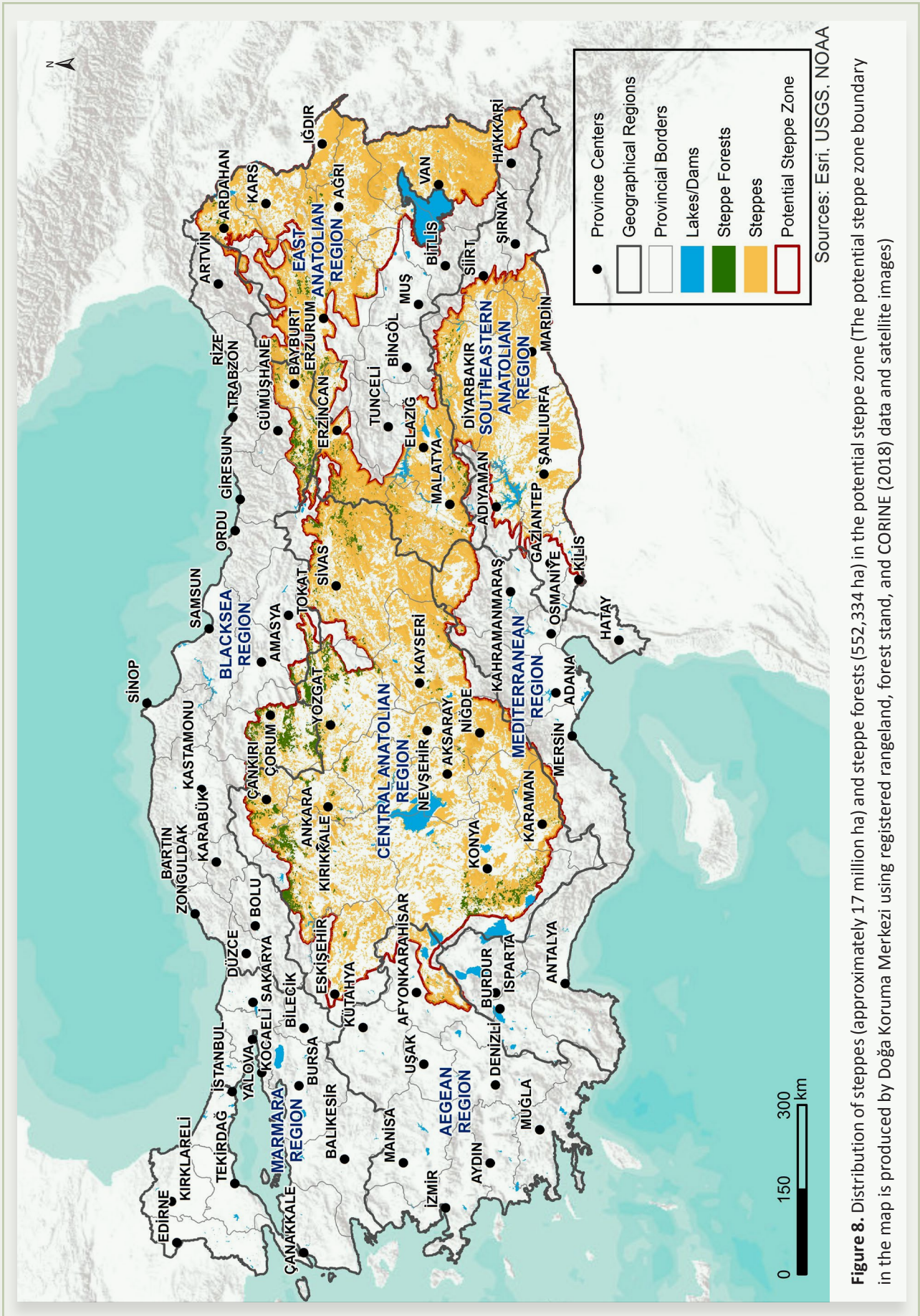
Figure 8. Distribution of steppes (approximately 17 million ha) and steppe forests (552,334 ha) in the potential steppe zone (The potential steppe zone boundary in the map is produced by Doğa Koruma Merkezi using registered rangeland, forest stand, and CORINE (2018) data and satellite images)

2.4.   Plant Richness of the Steppes of Turkey

The plant diversity of steppes makes up an important portion of the floristic richness of Anatolia. Most of the plant species that grow in forests and wetlands are common plants that span a wide part of the world's temperate zone. Therefore, the endemism rate is very low in wetlands and forests. On the other hand, grasslands and rangelands that are usually referred to as "steppes" are very rich in terms of both the diversity of plant species and endemism. This is mostly because steppes could accommodate unusual, seasonal, round-the-clock changes of ecological conditions (climatic conditions such as cold and rainy in winter, dry and hot in summer, and temperature differences between day and night and plenty of light) for the growth of plants as well as a rich geological structure. In places with such extreme features, only those plants that can adapt to these conditions can grow.

Today, most of the Anatolian lands with an altitude of 1,000-1,200 m have been converted to agricultural fields, and the meadows and rangelands that can be described as steppes are present mostly above 1,500 m. The steppes of Anatolia host meadows and rangelands suitable for large-scale grazing. Parts of these areas that fall in between agricultural fields are also rich in steppe plants and can be considered as their shelters indeed. On the other hand, since halophytic (salt-tolerant) vegetation that forms in lands with high levels of ground water is generally accepted as meadows-rangelands, they are regarded as steppe formation. These areas are particularly covered with halophytes as they cannot be used as agricultural fields without land rehabilitation.

Results from screening of more than 7,000 taxa (taxa growing in both steppes and forests, and weeds were excluded from this screening) that was done by reviewing 9 volumes of work entitled Flora of Turkey edited by the British botanist P. H. Davis, the first supplementary volume of which was done by Davis et al. in 1988 as well as the lists and articles published after the second supplementary volume of the given work by Turkish botanists Güner et al. can be summarized as follows: Plants that grow in dense or sparse forests and in forest openings in the formations where woody plants such as scrubs grow constitute approximately 40% of the plant taxa of the aforementioned feature, while plants growing in lowland and high mountain steppes and salt meadows constitute the 60% (Table 2). On the other hand, a more targeted and detailed study, which may result in the observation of increased numbers of steppe plants, may better portray the floristic richness of Turkey's steppes.

It does not take to be a professional botanist to comprehend the plant richness of steppes. As a nature enthusiast, you can observe as many as 10 seed plants within an area of 100 m² during a nature walk into a dense evergreen forest (e.g., pine forests). Since the sunlight reaches the ground better after the leaves fall in deciduous forests, one can observe many plants at these times here although not as many as in the steppes.

Table 2. Comparing plants of steppes and forests in Turkey

	Steppe	Forest
Volume 1	435	225
Volume 2	460	306
Volume 3	410	337
Volume 4	268	338
Volume 5	436	326
Volume 6	433	305
Volume 7	450	315
Volume 8	270	200
Volume 9	360	125
Volume 10	260	85
Volume 11	235	110
Checklists	430	200
TOTAL	**4,447**	**2,872**

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Excluding *Artemisia* steppes that are heavily degraded and subjected to overgrazing and steppes dominated by halophytes in the middle parts where salt concentration is the highest, at least 20-30 plant species can be observed in a steppe area. As the size of the area becomes larger, the number of plant species observed would also increase. *Astragalus*, *Verbascum*, *Centaurea*, *Allium* and *Silene* species, which are among the richest genera of Turkey, exhibit the richest diversity in steppes. Especially cushion-forming species of *Astragalus* are characteristic of mountain steppes. A great majority of the species of this genus grow in steppes. Similarly, approximately 90% of the mullein species are found in steppes. The situation is almost similar for the cornflower species. In addition to these three important genera, others that are extensively distributed in steppes are listed as follows according to the richness of species: *Campanula, Galium, Alyssum, Trifolium, Onosma, Euphorbia, Salvia, Veronica, Hypericum, Stachys, Dianthus, Scrophularia, Lathyrus, Vicia, Potentilla, Cirsium, Onobrychis, Gypsophila, Trigonella, Arenaria, Bupleurum, Minuartia, Tanacetum, Festuca, Asperula, Scorzonera, Sideritis, Achillea, Sedum, Senecio, Thymus, Cousinia, Erysimum, Linum, Iris, Bromus, Aethionema, Phlomis, Papaver, Thlaspi, Nepeta, Convolvulus, Crocus, Isatis, Fritillaria, Alkanna, Hesperis, Medicago, Ferulago, Paronychia, Paracaryum, Ornithogalum, Acantholimon, Poa, Myosotis, Origanum, Pimpinella, Artemisia, Hedysarum, Muscari, Colchicum, Eryngium, Marrubium, Limonium, Linaria, Ononis, Scutellaria, Aegilops, Anchusa, Asphodeline, Ebenus, Genista, Ajuga, Lepidium, Gentiana, Ballota, Taraxacum, Tragopogon*, and *Gagea*.

2.4.1. Endemism in the Steppes

Given that approximately 3,500 of about 10,000 seed plants are endemic, the rate of endemism is around 35% in Turkey. These numbers place Anatolia highly among other countries with temperate climate in terms of floristic richness and attraction. While the endemic plants of Anatolia are distributed in various plant formations, they are most densely found in high mountain meadows (steppes) and plains. Roughly estimated, 10% of the Anatolian endemic plants grow in scrublands and forestlands, and perhaps the same amount in rock environments (which can also be considered steppes), and the remaining 80% are distributed in steppes.

Most of the endemic species belonging to the genera common in steppes (detailed above) also grow in steppe areas. This is also valid for most of the genera whose endemic species are less compared to these. On the other hand, many of the endemic monotypic (only with one species) genera in Anatolia are also distributed in the steppes.

Given all these, meadows and rangelands, especially high mountain meadows, and plant communities in rock environments represent the most important plant formations of Turkey in terms of endemic species.

2.4.2. Steppes in Terms of Conservation

It is known that an endemic plant grows only in a certain region in the world. As Turkey's flora is deeply analyzed, it is found that most of the endemic plants grow in steppes. Most of these endemic plants span relatively wide areas. Some of the endemic plants can cover large areas locally, too. However, some rare endemic plants are distributed over very narrow areas, in fact with very few individuals they can be easily counted.

Here, two examples of local endemic plants can be given. One is *Cyanus tchihatchefii* ("yanardöner" in Turkish). It grows only in the agricultural fields by the water in Gölbaşı district of Ankara. Although it has been observed in recent years that it also grows in the agricultural fields near a pond to the west of Kulu, this is a very limited and small area considering the whole world. Another example is *Campanula ekimiana* ("ekim çanı" in Turkish). It is a rare endemic species that grows locally on the basalt rocks near the Güvem-Fındıklı village in the Kızılcahamam district of Ankara, with a small community in the world.

The steppes, that is to say the richest and most interesting pieces of land in Anatolia in terms of plant diversity, do not generally hold a protected area status. National parks and nature reserves in Anatolia are mostly located within forestlands. Nevertheless, recently accelerated efforts to establish new nature reserves within the steppes are good news. In the future, an increase in the number of such areas will be the most serious measure that can be taken for biodiversity conservation. It may seem that only plant species are protected in protected areas, but in fact, animal species (vertebrates and especially invertebrates) dependent on those plants for nutrition and shelter are also protected together with the plants.

Establishment of a national botanical garden, where the plants that are most threatened are grown and their seeds are preserved under ex-situ conservation conditions, and conduction of effective studies in this field is a point to be emphasized very carefully here. In Turkey, where plants of different phytogeographical regions grow, a botanical garden in at least each of the geographical regions is a necessity.

This text, which introduces the plant richness of Turkey's steppes, was taken from the following source:

Ekim, T., Kart Gür, M. (editors) 2019. Alıç Ağacının Gölgesinde Anadolu Bozkırları. Türkiye İş Bankası Kültür Yayınları, İstanbul.

2.5.   Animal Richness of the Steppes of Turkey

Steppes of Turkey have hosted thousands of species since the last Ice Age, and even before. Although the changing climate and human activities have altered the steppe boundaries in Turkey, many of the typical plant and animal species have survived from ancient times to the present.

The first and most comprehensive assessment of the zoogeography of Turkey' steppes was carried out by Curt Kosswig (1955). According to Kosswig, known as the father of zoology in Turkey, with the end of the ice age 10-14 thousand years ago, Eremial (desert-related) faunal elements infiltrated from the south and east and formed communities that overlapped from time to time with the species specific to cold steppes that existed in earlier periods. Although there is no sharp contrast as in the case of plants, there are differences between the Central Anatolian steppes and the Eastern/Southeastern Anatolian steppes. Southeastern Anatolia is home to more species specific to the steppes, as it is adjacent to the great deserts and semi-deserts to its south. This goes especially for reptile species. The Central Anatolian steppes differ from the Southeastern Anatolian steppes by the presence of some species specific to the Black Sea/Caspian northern steppes. The Anatolian Diagonal creates a biogeographical border that separates these two regions from each other. In the steppes (with trees) of Thrace, there are mostly species observed in similar habitats of Central and Eastern Europe.

Most animal species developed adaptive mechanisms under the pressure of environmental conditions such as the strong seasonality experienced in the steppes and lack of hiding places. These mechanisms include the following: hibernation, aestivation, migration behavior to deal with seasonal variabilities, enhanced digestive physiology and microbial symbiosis enabling herbivorous diet in response to the relatively abundant but hardly digested contents of the dominant herbaceous plants in terms of biomass; quick escape, invisibility through camouflage, and nocturnal or underground life for protection from the enemies.

In the Central and Southeastern Anatolian steppes, there is a dry period from June to September, which becomes direr in time. All plants, save for those that can reach water with their deep roots, either die after giving seeds in the beginning of this period or overwinter in a dry form by stopping their growth. This period is a difficult one for herbivorous animals, plant-dependent invertebrates and predators that feed on them. Therefore, many steppe species try to complete their reproductive cycle before the hot summer months arrive. Those that start breeding as soon as possible have an advantage over others, because they complete this process earlier.

Another solution to avoid heat and drought is aestivation by slowing down the metabolism in a place that helps minimize water loss during a dry season, as snails and some insects do. These species get active at the end of summer and continue their normal lives.

Winter season is another problematic period, especially for animals living in higher grounds. Most invertebrates overwinter in the form of egg or pupa. However, in terms of physiology and behavioral science, the most interesting adaptive mechanism is undoubtedly hibernation. Before the cold arrives, many resident mammals, reptiles, and amphibians prepare for winter by storing energy in the form of fat in their bodies. During hibernation in a suitable cavity under the ground, their body temperature, energy consumption and metabolism rate decrease. Thanks to detailed studies on ground squirrels, we know quite well about the hibernation cycle of a typical steppe creature (Kart Gür and Gür, 2018). Ground squirrels usually hibernate in a cavity in August, staying there from late February

Spermophilus citellus
(Ground squirrel)

©Murat Doğan

Ammomanes deserti
(Desert lark)

© Mahir Karataş

to early March. Their body temperatures range between 5-15 °C during the hibernation. Upon awakening every few weeks during hibernation, the body temperature rises to 35 °C for a short time and metabolism products accumulated in the body are processed to prevent harmful effects.

In the face of these unfavorable conditions, animals with high mobility among non-hibernating species such as birds, bats and butterflies choose to migrate. For instance, almost all insectivorous birds fly to subtropical and tropical regions to the south of Africa's Sahara Desert in September-October. On the other hand, high productivity in the steppes between April and June and the accompanying abundance of food offer ideal conditions for the migrants to raise their young. The return of migratory birds happens in March-May. Although some die in an attempt to take the long difficult journey, these journeys enable the species to overwinter under favorable conditions and sustain their populations.

Another common adaptive mechanism in the steppes is hiding through camouflage. It is very difficult to hide from predatory species in a habitat where vegetation is sparse and short. However, species that make their appearance look like the soil or vegetation around them can survive in these habitats. Larks (Alaudidae) from the birds, orthopteras (Orthoptera) from the insects, and lizards from the reptiles stand out when it comes to camouflage.

A group of mammals and amphibians choose nocturnal life both to minimize water loss and stay protected from predatory species active in the daytime. For these animals, which usually spend the day in a cavity under the ground, the life begins at sunset. Senses of hearing and sight of these species, which are active all night, are well developed.

Underground life represents an important aspect of ecology not only for nocturnal species, but also many diurnal mammals, reptiles, frogs and even birds. It takes just a few centimeters below the ground to be cooler in summer and warmer in winter, and this provides a shelter out of reach of many predators. Therefore, the advantages of a cavity under the ground become apparent in open biotopes such as steppes. It is observed that different species sometimes coexist in such cavities. Also, for hibernating species, subsoil creates the safest environment.

To bear in mind, the mole rat species that spends almost its entire life underground due to the advantages of the subsoil are well adapted to this environment in many aspects. Mole rats are often mistaken for insectivorous moles that live in more humid environments, but mole rats differ from them in that they are rodents that use their forelegs rather than their teeth to dig the ground. The mole rat that feeds on the underground organs of plants, can keep out of the above-ground dangers through the tunnels they dig. They regularly carry to

© İdris Ölmez

Gazella marica
(Arabian sand gazelle)

© İdris Ölmez

Ovis gmelini anatolica
(Anatolian mouflon)

the surface the earthwork they produce in piles. Some ecologists define the mole rats as key species due to the "ecological engineering" feature they have, which can change the habitats in such a way that affects other living creatures, since they are active round-the-year, feed on plants, cover developed plants and form a suitable seedbed for other plant species with their earth piles.

Another adaptive mechanism observed in steppe animals is the long and strong legs and a strong aerobic metabolism, which allows the animals to escape quickly from enemies. Most of the herbivorous mammals in open spaces around the world are noted for these features. Of the hoofed species in Turkey, the gazelles and mountain sheep can be caught by only a few predators. William's jerboa, one of the rodent species, escape from their enemies by jumping on their long hind legs and rapidly changing direction.

The special ecological relationship between plants and insects seen all over the world is also observed in the steppes. The pollinators of many steppe plants are bumble-bees and flies. Butterfly species typically lay their eggs only on plants belonging to a certain plant family or genus. Caterpillars hatching out of these eggs sometimes feed on these plants without being affected by chemicals that are toxic to other herbivorous insects. This special relationship can be observed between False Apollo (*Archon appolinus*) and plants of the genus *Aristolochia*, rare Steppe fritillary (*Euphydryas orientalis*) and *Scabiosa* spp., and blues (*Polyommatus* spp.) and grasses belonging to the Graminae family (Baytaş, 2019).

Archon apollinus
(False apollo)

©Hasan Sevgili

Ammoperdix griseogularis
(See-see partridge)

Motacilla flava
(Western yellow wagtail)

Two-thirds of the reptile and amphibian species recorded in Turkey exist in the steppes. Most of the lizard and snake species, which are less affected by heat and thirst than other living creatures, are distributed in the lowland and mountain steppes. The most notable examples of the eremial fauna are also found in this group.

Steppe birds are typically well-camouflaged species that spend most of their time on the ground, some even prefer running to flying. They nest on the ground. Partridges, grouses, larks, wheatears and pipits can be easily observed in Turkey's steppes. Predators such as the red hawk and kestrel, perhaps the most common birds of Turkey, spend hours soaring in the sky or waiting on a pole to catch small mammals, birds and reptiles. The steppes also serve as winter quarters for thousands of Fringillidae and Alaudidae.

Many of the small mammal species of Turkey are well adapted to the steppe environment. Vole (*Microtus* spp.) populations, which mostly exist in colonies, reach high numbers in some years. Although their complex taxonomic conditions are not yet fully established, it is likely that the endemic forms such as *Microtus anatolicus* and *Microtus dogramacii* exist in Turkey. Ground squirrels (*Spermophilus* spp.) forming loose colonies have two ecologically similar species in Thrace and Anatolia. The ground squirrels differ from other small mammals in their manner of life. On the other hand, nocturnal Tristram's jird (*Meriones*), William's jerboa (*Allactaga*) and golden hamster (*Cricetidae*) species contribute significantly to the faunistic richness of the steppe.

Some of the mammal species living in the steppes of Turkey are ecologically and culturally important species. Although Arabian sand gazelle (*Gazella marica*) is naturally observed only in Şanlıurfa province today, it is known that it ranged over the plains extending from the Euphrates to Cizre in the not-too-distant past. This species could survive after being taken under protection within Ceylanpınar State Farm (CSF) in 1960s (Turan, 1984).

Another species whose extinction was prevented by effective conservation efforts is Anatolian mouflon (*Ovis gmelinii anatolica*). Distribution area of this species, also known as "Ceran" and is the ancestor of the domestic sheep, had been shrunk to only Konya Bozdağ area 25 years ago. Thanks to the successful resettlement studies,

Microtus guentheri
(Günther's vole)

Allactaga euphratica
(Euphrates jerboa)

© İdris Ölmez

© Mustafa Akça

Pterocles alchata
(Pin-tailed sandgrouse)

Otis tarda
(Great bustard)

today, there are also small populations in Karaman, Ankara and Afyon. In the last centuries, the mouflon existed not only in many regions of Central Anatolia, but also in the Aras and Van steppes in Eastern Anatolia.

Unfortunately, other large mammal species associated with steppes, at least in Turkey, have become extinct. Aurochs (*Bos primigenius*), the ancestor of domestic cattle, is a species that went extinct a few thousand years ago. Kulan (Asiatic wild ass, *Equus hemionus*), which could live in the driest and saltiest steppes, disappeared from Central Anatolia about two thousand years ago and from Southeastern Anatolia a thousand years ago. Nevertheless, today, it is possible to observe its close cousins in the steppes of Iran and Central Asia. Gazelles could be seen in the plains to the west of the Euphrates, even in Çukurova, in the second half of the 19th century. At the beginning of the last century, gazelles and one of their close cousins existed on Iğdır plains. However, it is more likely to see sheep herds and tractors in the habitats of these wild species today.

Of the 10,930 vascular plants, bird, butterfly, mammal and reptile/amphibian species known in Turkey, 1,130 living predominantly in the steppes - at least at national level - have been classified as threatened, near threatened (NT) or deficient data (DD) (Ambarlı et al., 2016). Among these, there are species from every living creature group. For example, five of the reptile species (*Phrynocephalus horvathi, Acanthodactylus harranensis, Eremias pleskei, Montivipera wagneri, Vipera darevskii*) hold a Critical (CR) status. Similarly, among the bird species living in the steppes, steppe eagle (*Aquila nipalensis*), pallid harrier (*Circus macrourus*), saker falcon (*Falco cherrug*), little bustard (*Tetrax tetrax*), Sociable lapwing (*Vanellus gregarious*), Pin-tailed sandgrouse (*Pterocles alchata*) and desert lark (*Ammomanes deserti*) are endangered. In addition, among the steppe birds, the most endangered species is undoubtedly the great bustard (*Otis tarda*), an iconic, flagship bird among the heaviest birds of Turkey, the number of which does not exceed a few hundred. The future of this iconic species, which does not exceed a few hundred in number and is among the heaviest birds, is uncertain in Turkey.

The main reasons behind extinction, narrowing of habitats and population declines throughout history have been undoubtedly the expansion and intensification of agriculture, development of hunting weapons and transportation, and overgrazing pressure by livestock. Although notable efforts have been made and resources have been allocated to protect and increase the numbers of the large mammal species mentioned above, the same is not true for the steppe ecosystems whose functions and integrity also need protection. The proportion of protected steppe areas among all current protected areas is quite low. On the other hand, it is clear that more radical solutions are needed than establishing a protected area. It is essential that possible solutions be developed in a way that can turn the protection-use balance in favor of nature without destroying the livelihoods of people, especially by handling agriculture and animal husbandry with a new understanding, and if needed, using rehabilitation and restoration techniques.

2.6. Interaction between the People and Steppes in Turkey's Steppes

The Anatolian steppes have been the center of civilizations throughout history. Before the settled life, the foundations of places of worship such as Göbeklitepe were laid in upper Mesopotamia. Likewise, Anatolia is the center of agriculture and transition to settled life. However, as a result of all these, there has been a dramatic change in the vegetation.

It is known that between 8000-7000 BC, the people in Anatolia came out of caves and lived in open-sided huts and large nomad tents resembling villages (Kılınç, 1976). During this period, the people who encountered nature learned to take advantage of seeds and fruits of some plants, especially to collect grains, and even to store them for winter or other difficult times. In 7000-6500 B.C., they learned to plant and cultivate, based on the idea that the plants grew out of the ground. In this respect, especially Upper Mesopotamia was the place where agriculture was discovered (Kılınç, 1976).

After the establishment of villages and towns and the first settlements in Anatolia, in 6500-5500 BC, pottery was discovered in Mesopotamia and spread throughout the near east and Anatolia within 500 years. There were great advances in mining operations between 5000-4000 BC and in architecture and fine arts between 4000-3000 BC. When urbanization took place and different cultures emerged, nearby forests were destroyed because of the increased need for timber in construction sector and for wood in furnaces to be used to cook ceramics, make works of art, and process copper, bronze, iron and other precious metals.

In early ages, when humans came out of caves and established permanent settlements, they also domesticated animals around them. Humans domesticated dogs as housemates around 10000 BC and goats to benefit from their meat and milk around 7000 BC. Later, they domesticated sheep around 6000 BC to benefit from their wool and milk. Cattle were also domesticated by people around 500 BC (Kılınç, 1976).

Clearing of lands for agriculture, growing population, encroachment of settlements, increased need for rangelands due to the development of animal husbandry and the use of wood as an energy source for heating and mining have weakened the forest cover in the Southeast, East and Central Anatolia Regions, causing the forests to turn into steppes with Irano-Turanian characters (Akman, 1974).

Karahan Hill

© Bahattin Çelik

2.6.1. Human Activities Compatible with the Steppes – the Steppe Culture

The steppe culture emerged as a result of diversifying and developing possibilities of where people can live to survive. While the steppe culture forms the social and economic structure, the horse and iron constitute the most important elements of this culture. The customs, which developed in parallel with those of the nomadic culture, represent another important element of this culture.

Steppe nomads represent a productive (agriculture and animal husbandry) organization unlike fishing nomads or those of forests and deserts.

2.6.2. Importance of the Steppes as Genetic Reserves

Steppes are biogenetic reserves. One of the most important features of steppes is that they serve as "Gene Centers" of field and forage crops, including nutritional legumes such as lentil (*Lens* spp.), chickpeas (*Cicer* spp.), and vetches (*Vicia* spp.) as well as wheat (*Triticum* spp.) and barley (*Hordeum* spp.) (Harlan, 1971). In terms of genetic diversity, Turkey holds a special place in the world because of its steppes (Kurt et al., 2014). According to a classification made in this context, Anatolia is extremely rich in genetic resources because of its location at the intersections of two important gene centers (Mediterranean and Near East) (Ladizinsky, 1998; Figure 9).
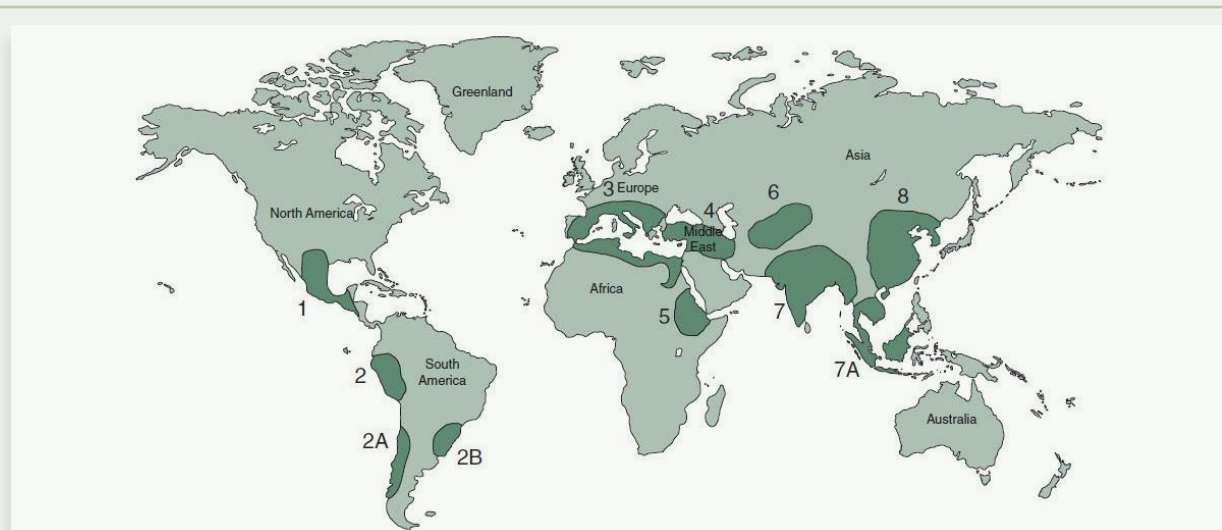
Figure 9. Main centers of cultivated plants (1 Southern Mexico and Central America, 2 North of South America – Peru, Ecuador, Bolivia, 2A Chiloe island – Islands near Chile, 2B Brazil-Paraguay, 3 Mediterranean, 4 Near East- Asia Minor- Transcaucasia, Iran and Turkey, 5 Ethiopia and Somalia, 6 Central Asia- Northwest India, Afghanistan, 7 Northeast India and Myanmar, 7A Indonesia-Malaysia, 8 China)

In Turkey, there are 5 microgene centers where more than 100 species show a wide variety (Harlan, 1995). In addition, Turkey is the origin or diversity center of numerous cultivated plants and other plant species. The micro-gene centers and common species in Turkey are shown in Table 3.

Tablo 3. The microgene centers and common species in Turkey according to Harlan

Microgene Center	Species
Thrace-Aegean	Bread wheat, durum wheat, Polish wheat, Persian wheat, einkorn, Triticum spelta, grits, yellow melon, lentil, chickpea, common vetch, clovers.
Southeastern Anatolia	Einkorn, emmer, spelt, vegetable marrow, watermelon, yellow melon, cucumber, grape, bean, lentil, chickpeas, vetches, forage crops.
Samsun-Tokat-Amasya	Fruit types, bean, lentil, vetches, legumes, forage crops.
Kayseri and its surroundings	Apple, almond, pear, fruit types, vine, lentil, chickpeas, clover, sainforn.
Ağrı and its surroundings	Apples, apricots, sour cherry, cherry, yellow melon, forage, legumes.

Astragalus plumosus
(Milkvetch)

©Latif Kurt

Verbascum lasianthum

©Latif Kurt

Anatolian steppes are considered the formation center of some other taxonomic groups in addition to being a gene center of many cultivated plants. Since steppe plants host the ancestral forms of cultivated plants, they act as insurance for cultivated plants.

Three important genera originated from the steppes of Anatolia are *Verbascum*, *Centaurea* and *Astragalus*. *Astragalus* is represented by 450 species, 50% of which are endemic; *Verbascum* by 244 species, 79% of which are endemic; and *Centaurea* by 162 species, 64% of which are endemic. As examples of herbaceous plants, *Isatis* spp., *Draba* spp., *Alyssum* spp., *Astragalus* spp., *Alcea* spp., *Phlomis* spp., *Salvia* spp., *Verbascum* spp., *Scrophularia* spp., *Veronica* spp., *Campanula* spp., *Anthemis* spp., *Centaurea* spp., *Achillea* spp., *Allium* spp., and *Iris* spp. can be given, while a typical example of woody plants would be oak *Quercus* spp.

Steppe is the last cover that holds the soil. Steppe areas, which constitute the largest rangelands in Turkey, have been subjected to a grazing pressure that they cannot take since the domestication of goats and sheep. The overgrazing has caused species such as *Acantholimon*, *Astragalus* spp., *Cousinia* spp., *Alhagi pseudalhagi*, *Peganum harmala*, and *Euphorbia tinctoria*, which are spiny and bitter species that animals cannot eat, to reach a climax and thus has led to the decrease or even the disappearance of characteristic steppe species in these natural areas. Due to overgrazing, the vegetation of steppes has deteriorated significantly, the species composition has changed, and nutrient-poor species have become prevalent. As a result, erosion has been intensified in some places. The most typical example is the unstable dunes caused by wind erosion in Karapınar.

The first written information regulating the use of steppes as rangelands is seen in the famous Hittite Laws drafted by Hittites between 1390-1350 BC. From past to present, the pressure on steppe ecosystems (land clearing, grazing, etc.) has gradually increased. There was no significant change in the number of bovine and ovine animals, nevertheless, especially steppe ecosystems, which were 44 million hectares in the 1940s, declined to approximately 14 million hectares with the transition to mechanical agriculture. In many regions, especially in the large plains, steppes can be ranged in mosaic form especially in the slopes that cannot be cultivated as agricultural fields.

Steppes have undertaken many ecological functions such as creating genetic reserves with the biodiversity they contain, serving as insurance for cultivated plants, and serving for different uses.

Additionally, as the cheapest roughage source in countries where animal production costs are high, as in Turkey, steppes assume special importance. In addition, steppes account for regions where the best quality honey is produced by beekeepers.

Steppes represent extremely important ecosystems in terms of development of animal husbandry, preservation of soil and water, erosion control, and conservation and sustainability of genetic resources.

2.7.   The Use of Rangelands in Turkey

Rangelands are natural areas with a wide range of ecological and economic assets, including genetic resources, biodiversity, habitats for wildlife, erosion prevention, medicinal materials and beekeeping, in addition to being lands allocated for livestock grazing and similar purposes.

Rangelands, uniquely instrumental in preventing disasters such as erosion, vegetation fires, and floods, are natural resources that almost insure the country together with forests. In many countries, rangelands are considered to be very important resources both for meeting the roughage requirement of the livestock and protecting the environment. Also, these areas are considered to be very productive and profitable with high nutrient inputs in regions where ecological conditions especially rainfall are favorable (Kendir, 2017).

In Turkey, an important part of the roughage used for feeding livestock is met from the rangelands. These forage acres still maintain their importance for animal husbandry due to their high feed potential, and their benefits to the environment and human health. As the cheapest roughage source in countries where animal production costs are high, as in Turkey, rangelands assume special importance. Considering the energy requirements of the livestock, rangelands are indispensable in breeding livestock that need good and quality feed; in case these rangelands are not used, breeders will have to purchase feed, which may be costly. In addition, rangelands represent regions where the best quality honey is produced by beekeepers. Rangelands provide an average of 12-18.5% crude protein, depending on the species composition and environmental conditions, whereas the wheat straw contains 3.6% crude protein. Besides, rangeland grasses are especially rich in vitamins A, E and B and minerals. Animals that graze in rangelands are healthier and calmer. In addition, the products of animals in rangelands are of better quality and delicious (Gökkuş, 2018).

Since rangelands in Turkey are legally protected against construction, allocating steppe and meadow ecosystems as rangelands, especially around settlements, plays an important role in the conservation of these areas in Turkey. On the other hand, over-use of steppe and meadow ecosystems allocated as rangelands may cause a decrease in biodiversity.

Plant and animal species in properly managed rangelands add to the biological value of these lands, contribute to the formation, development and maturation of the soil they depend on, and play a key role in the sustainability of steppe ecosystems. In this way, the soil is protected with a rangeland culture and becomes a more suitable habitat for many species. Rangelands contribute to the increased soil fertility as source of plant nutrients, and play a role in erosion control and land rehabilitation, and even in crop rotation. In addition, rangelands host a large number of plant species that make up the vegetation, which are very important in soil improvement because they have different root systems (such as pile roots that can go deep and fringe roots that can form a dense root system in the upper soil) (Koç et al., 1994).

A large part of Turkey is located in a climate zone that is accepted as semi-arid. In semi-arid regions, the precipitation is low and erratic throughout the year. The lack of rainfall is the biggest factor that restricts plant growth. Rangelands infiltrate the rainfall deep into the soil and help store it in different layers; this way, underground water increases in amount, and the limited water is not lost to runoff. Since meadows and rangelands are important catchments, they take a vital role in the natural water cycle by feeding the ground waters, springs and rivers throughout the year by way of letting the rainfall into the soil.

According to the Pasture Law No. 4342, rangeland is "the place allocated or used for these purposes since ancient times for grazing animals and benefiting from their grasses". Rangelands, which represent a specific land use under the steppe ecosystems, also have different types. The main underlying reason for this is the emergence of different vegetation types in different ecological regions. While in Bedouin geography it is the deserts that are used as rangeland, in Central and Western Europe it is artificial grazing lands, in Northern Europe the areas with dense vegetation and in Turkey the steppe ecosystems (Altın et al., 2011).

2.7.1. Rangelands in the World

On a global scale, rangelands span 52.5 million km^2. This area corresponds to approximately 40% of the terrestrial surface area, excluding the frozen areas of the world. Rangelands can be found in every region, with the largest ones in Sub-Saharan Africa (14.5 million km2) and Asia (8.9 million km2). Grasslands with different types of vegetation are found in semi-arid regions (28% of the world's rangelands), humid regions (23%), cold regions (20%), and arid regions (19%). In some sources, more than half of the global surface area is defined as areas used for grazing, in other words as rangelands.

Rangelands are mostly formed on soil structures that are not suitable for agricultural practices due to topographic and climatic reasons. Most of these areas are intensively used for grazing with low input application. In European countries and New Zealand, rangelands are areas used for grazing intensely. Rangelands, whether used extensively or intensively, account for the most important roughage source of livestock in countries where they are found. In the USA, 40% of the feed consumed by livestock comes from rangelands, 20% from forage crops, and 40% from concentrated feed. 97% of the feed consumed by ruminants in Ireland, 83% in England and 71% in France is obtained from rangelands (Altın, 2006). On a global scale, rangelands contribute to approximately 7% of beef production, 12% of sheep and goat meat production, and 5% of the global milk supply. Therefore, this type of land use makes a significant contribution to the supply of livestock products, food security of shepherds, and national economic development (Dettenmaier et al., 2017).

Rangelands may be owned by the State or they may be private property. In many industrialized countries, public-owned rangelands are used by individual livestock enterprises for a certain rent. In the USA, public-owned rangelands are rented to private livestock enterprises by the government. Nevertheless, the use and care principles of these areas are planned by the government, and private livestock enterprises implement these plans. The implementation of the plans is regulated by the government (Altın, 2006).

In industrialized countries whose economy is heavily dependent on animal husbandry, specialized livestock enterprises benefit from these types of areas. In underdeveloped or developing countries, most of which are located in the arid regions of Africa and Asia, the use and care of rangelands go unregulated, and they are mostly degraded because of unfavorable ecological conditions (Altın, 2006).

2.7.2. The Current Situation in Turkey

Areas with natural vegetation used for grazing in Turkey have three different statuses in terms of ownership. These are as follows;

   i) Rangelands governed by the Pasture Law

   ii) Lands for grazing under the Forest Law

   iii) Public lands (used for grazing)

According to TÜİK, there are approximately 14.6 million hectares of rangelands in Turkey. In addition, 12 million hectares of registered land in the forest inventory is used for grazing livestock. As to the grazing activities in those areas, the Forest Law No. 6831 forms the legal basis for forest lands whereas the Pasture Law No. 4342 governs rangelands. There is no such legislation for public lands.

In Turkey, the biggest changes happened in rangelands of all fundamental land resources, always to the penalty of rangelands. For example, 9 million hectares of rangelands were plowed and converted into agricultural fields in 1945 with the "Law on Villagers with Lands". In 1969, with the establishment of the Ministry of Forestry (abolished), 7.5 million hectares of scrublands were put in the scope of forestlands and heathlands. Rangelands, which were reported as 21.7 million ha in the land classification study made by the General Directorate of Soil and Water of the period, were recorded as 14.6 million ha as a result of the general agricultural census. Determination works covered 11,696,494 hectares of the total rangeland area, which was 21,698,400 ha in 1970 and 14,616,687 ha in 2001. There was a significant reduction in rangeland areas (approximately 33%) on a national scale from 1970 to 2001. Southeastern Anatolia and Eastern Anatolia regions experienced the highest decrease (Table 4).

Table 4. Changes in the rangelands

Regions	1970 Rural Services (ha)	1991 Agricultural Census (ha)	2001 TÜİK Census (ha)	2019 Determined Rangeland Area (ha)	2001-2019 Change Rate (%)
Aegean	1,027,900	615,900	802,879	276,924	-22
Marmara	463,600	564,100	552,662	283,743	19
Mediterranean	1,002,400	434,300	659,334	580,406	-34
Central Anatolia	5,884,200	3,890,300	4,570,182	4,166,634	-22
Black Sea	1,993,100	1,556,000	1,533,605	1,263,469	-23
Eastern Anatolia	9,162,100	4,573,400	5,485,449	4,337,580	-40
Southeastern Anatolia	2,165,100	743,600	1,012,576	787,739	-53
TOTAL	**21,698,400**	**12,377,600**	**14,616,687**	**11,696,494**	**-33**

2.7.3.   The Balance Between the Area of Rangelands and the Number of Livestock

The number of livestock has changed in different directions in Turkey since 1970; it increased from 1970 to 1980, decreased from 1980 to 2001 and then increased steadily again (Figure 10). Considering the rangelands used by livestock, a serious decline was experienced until 1990, and no major decline/change was experienced in the following years. In the light of this information, it is safe to state that there is a constant decrease in the rangeland area per livestock unit in Turkey. These figures indicate an increase in intensity of grazing in rangelands all the years except for between 1990-2001. Overgrazing causes weakening of the vegetation of the rangelands. As a matter of fact, in a study that covers most of Turkey's rangelands, it has been concluded that only 12.4% of the rangelands in Turkey can produce sufficient and quality animal feed, and the remaining 87.6% are in moderate or poor conditions (Ayan et al., 2020).
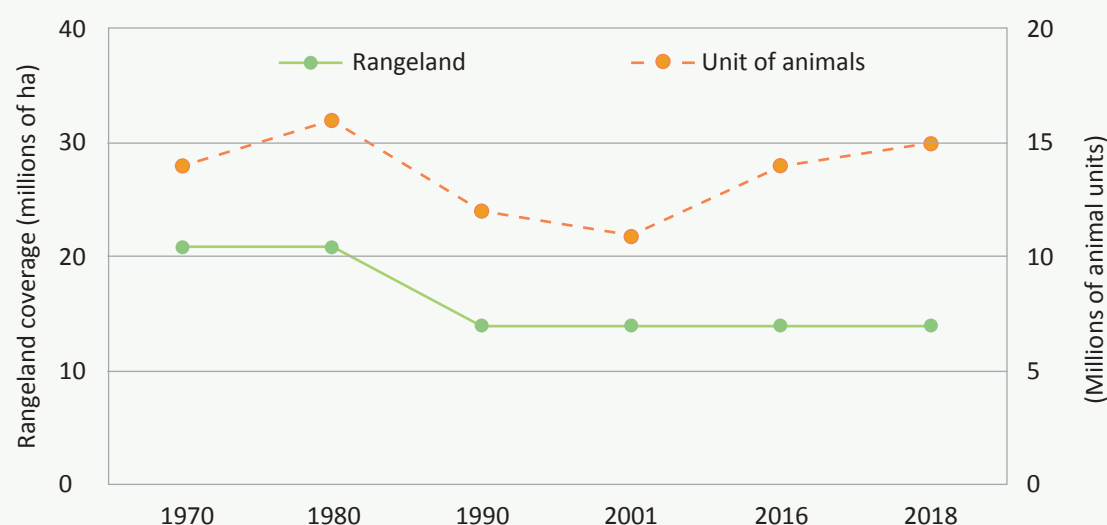
Figure 10. Changes by Years in Rangeland Area and Animal Existence (1970-2018)

The fact that rangelands in Turkey hold a common property status can cause them to be used without necessary care and improvement. This situation is one of the biggest dilemmas in rangeland use and animal husbandry. Breeders benefiting from rangelands use these areas in an unrestricted and uncontrolled manner generally without incurring any costs other than the cost of a shepherd. The "grazing fee" that is imposed by the law cannot usually be charged from the breeders. Overgrazing in the rangelands, lack of care and improvements in return and inadequate regulations on rangeland use cause these areas to significantly lose their productive potential and ecological functions.

Although the Pasture Law and the regulations enacted accordingly impose restrictions on the use of rangelands, there are problems in practice. This type of use has caused substantial land degradation in the rangelands. Especially, rangelands in the Central Anatolia Region (sloping generally over 30%) have become unable to retain the soil they depend on.

An important reason behind rangeland degradation is "overgrazing". As a result of overgrazing, plants are left with insufficient photosynthetic tissues and buds to regenerate. Accordingly, plants that have to consume more of the spare nutrients become physiologically weak and sensitive to unfavorable use and environmental factors and gradually disappear from the vegetation. Overgrazing pressure on rangelands in Turkey is not very severe (Gökkuş, 2018). However, the risk of severity is quite high in some regions, especially in the Southeastern Anatolia. For this reason, it is of great importance to pay attention to the carrying capacity of a rangeland during the grazing season. Respecting the start and end date of grazing and the number of livestock declared is also very important for the sustainability of rangelands. Grazing planning and putting these plans into force are essential.

2.7.4. Rangeland Improvement Projects

In accordance with the Pasture Law No. 4342, rangeland improvement and management projects have been implemented in Turkey with a view to undertaking care and improvement efforts in meadows and rangelands allocated to a particular village or municipality, and then delivering them to Rangeland Management Unions to be established in villages. The necessary financing for these projects is provided by the Ministry of Treasury and Finance from a separate allowance in the government budget. The primary aim of these projects is to achieve sustainable use of rangelands in villages or municipalities with rangelands, by establishing a balance between feed resources and livestock count over a period of 3-5 years. In order to achieve this balance, the projects aim at meeting the quality roughage requirements of the existing livestock by taking all feed sources in the village or town into account. To this end, increased feed production in rangelands and feed utilization rates of livestock are targeted by use of techniques such as fertilization, irrigation, over seeding, sown rangeland establishment, watering through, canopy construction, and fence construction. On the other hand, in order to close the feed deficit and to let the rangelands rest by reducing the pressure on them, cultivation of forage crops is supported. To this end, seed, machinery and fertilizer supports are provided. In meadows and rangelands that are used in accordance with the principles of grazing management, feed yield can go up by 2-6 times. At the end of the project, management and responsibilities of the rehabilitated rangelands are handed over to the Rangeland Management Unions established in villages (Kendir, 2017).

2.8.   The Legal Framework and Institutional Structure Related to Steppes

2.8.1. The Policies, Legislation and Mechanisms Associated with the Conservation and Sustainable Management of the Steppes

Unlike forests and wetlands, steppes are not defined in the Turkish legislation. On the other hand, steppe ecosystems of Turkey comprise natural steppes, meadows, rangelands and steppes with trees, and there are supporting elements associated with conservation and sustainable management of steppes in many policy documents.

In this context, while preparing this strategy and action plan within the scope mentioned above, all international conventions and programs, legislation, policies and mechanisms that may be related to steppe ecosystems were taken into consideration.

International Conventions and Programs

The conventions to which Turkey is a party have the force of law and are part of national legislation. The main international conventions related to steppes and conservation of environment and biodiversity, to which Turkey is a party, are as follows:

- The Convention on the Conservation of European Wildlife and Natural Habitats; BERN (signed by Turkey in 1984)

- The Convention on Wetlands of International Importance especially as Waterfowl Habitat; RAMSAR (signed by Turkey in 1994)

- The Convention on Biological Diversity; CBD (signed by Turkey in 1997)

- The United Nations Convention to Combat Desertification; UNCCD (signed by Turkey in 1998)

- The United Nations Framework Convention on Climate Change; UNFCCC (signed by Turkey in 2004)

- The International Treaty on Plant Genetic Resources for Food and Agriculture; ITPGRFA (signed by Turkey in 2006)

Most of these international conventions aim directly or indirectly at the conservation of steppe ecosystems and the biodiversity they contain. The United Nations Convention on Biological Diversity (CBD) sets out the main framework of the equitable sharing of benefits arising from the use of genetic resources with the conservation and sustainable use of steppe biodiversity, and of how the conservation and sustainable use of steppe biodiversity can be addressed (CBD, 2019).

"Dry and Sub-humid Lands Biodiversity Programme of Work" and "Agricultural Biodiversity Programme of Work" under the Convention on Biological Diversity contain objectives supportive of the conservation and sustainable use of steppe biodiversity. In particular, the importance of assessing the state and trends of biodiversity, identifying and disseminating knowledge and practices of local communities, promoting ecosystem-based resource management, and supporting sustainable livelihoods are addressed.

In addition, the United Nations Framework Convention on Climate Change (UNFCCC) is important for the sustainable use of steppe resources and improving their adaptive capacity to climate change. The United Nations Convention to Combat Desertification (UNCCD) contributes to the conservation of steppe ecosystems in line with the strategic objectives of improving the conditions of degraded ecosystems, including steppe ecosystems, combating desertification/land degradation, promoting sustainable land management and

contributing to land degradation neutrality, increasing drought tolerance of fragile ecosystems and contributing to biodiversity and climate change issues (UNCCD, 2019).

The United Nations General Assembly convened the Sustainable Development Summit in 2015 and adopted the "2030 Sustainable Development Goals (SDG)". The Sustainable Development Goals, consisting of 17 Global Goals, are a universal call for action to eradicate poverty, protect our planet, and ensure that all people live in peace and prosperity. Under Global Goal 15, the conservation, sustainable use and restoration of terrestrial ecosystems, the conservation of habitats and species, the support of fair and equitable sharing of benefits from the use of genetic resources, and the promotion of access to such resources, the prevention of illegal hunting and trafficking, financing and provision of sustainable livelihoods for local people are emphasized. This goal underlines the importance of protecting steppe ecosystems and the biodiversity they host, on the way to sustainable development (UNDP, 2019). In addition, on March 2019, the UN General Assembly declared 2021–2030 the "UN Decade on Ecosystem Restoration" and emphasized that along with the conservation of ecosystems, the restoration of ecosystems is needed more than ever and is necessary to achieve the Sustainable Development Goals. This will provide ecological, social and economic benefits in many areas such as ecosystem restoration, biodiversity conservation, poverty alleviation, food security and climate change. At the same time, the UN aims to prevent, stop and reverse the degradation of ecosystems with this global initiative, which contributes to implementation of conventions related to biodiversity, climate change and combating desertification. In this context, the restoration of ecologically important and sensitive steppe ecosystems is becoming increasingly important.

Turkey, as a member of United Nations, is a member of platforms and partnerships, especially organizations affiliated to the UN and other global entities. Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) is an independent intergovernmental body established to support the formulation of policies for protection of the world's biodiversity and ecosystems and the services offered to humanity. It was established in 2012 with the membership of countries that are members of the United Nations Food and Agriculture Organization (FAO) Global Soil Partnership (GSP) in order to contribute to the conservation and sustainable use of soils to ensure food security on a global scale. The aim of the initiative is to support main ecosystem services, protect healthy and fertile soils for food security and improve the world's limited land resources. Both of these platforms offer significant opportunities for steppes.

National Laws and Regulations

All laws and regulations that can contribute to the conservation and sustainable management of steppes, including regulations on conservation of biodiversity, sustainable use of natural resources, agriculture, and animal husbandry, have been addressed in detail (Annex 1). The main laws and regulations considered in this context are as follows:

- Law on Pastures (Law No. 4342, dated 25.02.1998) and Regulation on Pastures (OG No. 23419 of 31.07.1998)

- Forest Law (Law No. 6831, dated 31.08.1956) and Forest Management Regulation (OG No. 26778 of 05.02.2008)

- National Afforestation and Erosion Control Mobilization Law (Law No. 4122, dated 23.07.1995), Regulation on Forest Services on Afforestation and Erosion Control (OG No. 29945 of 11.01.2017), Regulation on Afforestation (OG No. 30927 of 23.09.2019)

- Environmental Law (Law No. 2872, dated 09.08.1983)

- National Parks Law (Law No. 2873, dated 09.08.1983)

- Terrestrial Hunting Law (Law No. 4915, dated 01.07.2003)

- Law on Conservation of Cultural and Natural Property (Law No. 2863, dated 21.07.1983)

- Wetland Conservation Regulation (OG No. 28962 of 04.04.2014)

- Regulation on Procedures and Principles of Determination, Registration and Approval of Protected Areas (OG No. 28358 of 19.07.2012)

- Agricultural Law (Law No. 5488, dated 15.04.2006), Agricultural Basins Regulation (OG No. 27695 of 07.09.2010), Regulation on Good Agricultural Practices (OG No. 27778 of 07.12.2010)

- Soil Conservation and Land Use Law (Law No. 5403, dated 03.07.2005) and Law Amending the Soil Conservation and Land Use Law (Law No. 6537, dated 30.04.2014), Regulation on the Conservation, Use and Planning of Agricultural Lands (OG No. 30265 of 09.12.2017), Regulation on Subsidizing Farmers That Implement Environmentally-Friendly Agricultural Land Protection Program and Providing Technical Assistance to These Farmers (OG No. 25994 of 15.11.2005)

- Organic Farming Law (Law No. 5262, dated 01.12.2004) and Regulation on the Principles and Implementation of Organic Farming (OG No. 27676 of 18.08.2010)

- Law on Land Reform regarding rearrangement of land in irrigated areas (Law No. 3083, dated 22.11.1984), Implementation Regulation on Land Consolidation and On-Farm Development Services (OG No. 30679 of 07.02.2019), Regulation on Preparation, Implementation and Follow-up of Basin Management Plans (OG No. 28444 of 17.10.2012)

- Biosafety Law (Law No. 5977, dated 18.03.2010)

- Veterinary Services, Phytosanitation, Food and Feed Law (Law No. 5996, dated 11.06.2010)

- Seed Law (Law No. 5553, dated 31.10.2006)

- Regulation on the Collection, Production and Export of Natural Flower Bulbs from Nature (OG No. 30014 of 21.03.2017)

A significant part of steppes is used as rangelands/pastures with public ownership. Rangelands may hold three different statuses in terms of ownership:

(i) Rangelands under the Pasture Law,

(ii) Lands for grazing under the Forest Law and

(iii) Public lands (used for grazing).

As to regulation of grazing, Forest Law No. 6831 is taken as legal basis for the forest lands whereas Law on Pastures No. 4342 is taken as legal basis for the rangelands. There is no such legislation for public lands. The Law on Pastures aims at determination and delimitation of pastures, summer pastures, winter pastures, public pastures and meadows, their allocation on behalf of village or municipality legal entities, their use in accordance with the rules to be determined, provision of care and improvement for increasing and maintaining their productivity, continuous monitoring and protection of their use, and changing the type of use when necessary. Regulation on Pastures, which includes the procedures and principles regulating the implementation of the Law on Pastures, includes administrative and executive provisions regarding the delimitation and allocation of rangelands, pastures, and grasslands and grazing plans. In our country, the studies for determination, delimitation and allocation of rangelands still continue. Completion of these studies is important in terms of realizing the necessary conservation and sustainable resource management practices.

There is no special protected area status for steppes in Turkey. Based on the National Parks Law, Terrestrial Hunting Law, International Ramsar Convention, Wetlands Regulation, Law on Conservation of Cultural and Natural Property, and the Environmental Law, some of our natural steppes are covered by different protected area statuses such as National Park, Natural Park, Natural Monument, Nature Reserve, Wildlife Reserve,

Wetland of National Importance, Wetland of Local Importance, Special Environmental Protection Area, and Natural Protected Area. These laws contain provisions on the protection of the wildlife and ecosystem values offered by these areas and thus constitute an important base for the conservation of steppes and species.

In addition to these protection statuses, the Soil Conservation and Land Use Law and related regulations, and accordingly declaration of steppes as Agricultural Protected Areas (Large Plains Project) for prevention of degradation of areas with high agricultural potential due to erosion, aridity, pollution and misuse provide an important opportunity for steppes.

Another important law that directly concerns the steppes in Turkey is the Agricultural Law. The Agricultural Law aims to develop and support the agricultural sector and the rural areas and includes provisions for conservation and improvement of natural and biological resources. Steppes are mostly classified and managed as farming areas and rangelands. In the law, the issue of agricultural basins is included as an explicit provision in order to concentrate, support, organize, specialize and integrate agricultural production in suitable areas for its own ecology. For this purpose, regulations that concern supports for the agricultural basins, rural development, animal husbandry, and Environmentally-Friendly Agricultural Land Protection Program provide opportunities for the sustainable use of soil and water resources, conservation of steppes with agricultural and animal husbandry practices that support biodiversity, and reduction of intense agricultural pressure on these areas. The Soil Conservation and Land Use Law, which is another important law on this issue, envisages procedures and principles for planned use, in accordance with the principle of protection and use of soil by preventing loss of quality and quantity of soil, and the sustainable development that prioritizes the environment. This law aims to protect agricultural fields, including agricultural lands with steppe ecosystems. All kinds of interventions to open the natural steppes up for agriculture are within the scope of this law. The studies on land size and land management efficiency within the scope of the law will increase productivity and reduce opening and conversion of marginal lands to agriculture. In addition, the Soil Conservation Boards established in each province within the scope of the Regulation on the Conservation, Use and Planning of the Agricultural Lands have important duties such as the conservation, development and efficient use of agricultural fields, development, conservation and recovery of land features, and adoption of soil conservation measures on a local scale.

Lastly, the Organic Farming Law and the relevant Regulation and Good Agricultural Practices Regulation form the legal basis to encourage eco-friendly agricultural practices. Such practices reduce the degradation of natural lands around the agricultural fields due to agricultural practices. In addition, regulations regarding foraging and protection of plant and genetic resources contribute to the conservation of steppe biodiversity.

National Policy Papers

The relevance of the policy documents to the conservation and sustainable management of the steppes is evaluated in detail under 4 different headings, namely National Development Plans and Programs, National Strategies and Action Plans, Institutional Plans and Programs, Regional Plans and Programs (GAP Region) (Annex 1). These documents were scanned for the term "steppe" and it was seen that the term "steppe" is not mentioned in many documents. In this scanning work, the objectives, goals and actions that can contribute to the conservation and management of steppes were examined and assessed in detail, especially in the documents that do not contain the term "steppe".

National Development Plans

The term "steppe" does not appear in the 9th, 10th, and 11th Development Plans of Turkey; however, nature conservation and biodiversity policies are included in the national programs as a part of the five-year development plan. In the 9th Development Plan, conservation and development of biodiversity and added economic value are determined as a priority (Article 459; Başbakanlık Devlet Planlama Teşkilatı, 2007). As

to the goals and objectives of the 10th Development Plan, natural resources and ecosystem services are covered as well as implementation processes by measuring their value, and identification, conservation, sustainable use, development and monitoring of biodiversity, which is important for agriculture, forestry, food and pharmaceutical industries (Article 1037 and 1039; Kalkınma Bakanlığı, 2012). In the 11th Development Plan (2019-2023), policies and measures related to "Determination, registration, protection, sustainable use, development, and monitoring of biodiversity and genetic resources, prevention of their trafficking, and bringing the benefits of genetic resources and related traditional knowledge to our country (Article 716)" and "Effective management of protected areas by increasing the number of protected areas on land and sea for protection, restoration and sustainable use of ecosystems and ecosystem services (Article 717)" under the subject of "Environmental Protection" constitute an important legal basis for steppes. Under the subjects of "Agriculture", "Urban Infrastructure" and "Rural Development", there are policies and measures related to the conservation, development and sustainable use of natural resources and biodiversity (Türkiye Cumhuriyeti Cumhurbaşkanlığı Strateji ve Bütçe Başkanlığı, 2019).

National Strategy and Action Plans

The Strategy and Action Plans with direct objectives related to the conservation and sustainable management of steppes are as follows:

- National Biodiversity Strategy and Action Plan - NBSAP (2007) and National Biodiversity Action Plan - NBAP (2018-2028)

- Draft-Ecosystem-Based Adaptation Strategy in Anatolian Steppe Ecosystems (2018)

- National Strategy and Action Plan for Combating Desertification - NSAPCD (2015-2023)

- Turkey's National Climate Change Strategy (2010-2023), Turkey's National Climate Change Strategy and Action Plan - CCSAP (2011-2023) and Turkey's National Climate Change Adaptation Strategy and Action Plan - NCCASAP (2011-2023)

- Draft-National Capacity Action Plan (2011)

- Draft-Turkey's National Protected Areas and Climate Change Strategy (2011)

NBSAP emphasizes that the existing protected areas do not adequately represent the biodiversity components of Turkey, especially steppe and marine ecosystems. The Strategic Goal 5, "Conservation of steppe biodiversity, sustainable use of its components, equal and fair sharing of benefits arising from the use of genetic resources and combating the loss of steppe biodiversity and its socio-economic consequences", includes objectives and actions related to steppe ecosystems (Çevre ve Orman Bakanlığı, 2007). Since the NBSAP Goals and Objectives are valid for the period of 2018-2028 and are associated with the NBAP, the national goals specified in the NBAP also support steppe ecosystems (Tarım ve Orman Bakanlığı, 2019a). The Draft Ecosystem-Based Adaptation Strategy in Anatolian Steppe Ecosystems includes goals related to the conservation and management of steppes under many different subjects, aiming to facilitate and encourage ecosystem-based adaptation strategies and practices in steppe ecosystems for adaptation to climate change (Avcıoğlu-Çokçalışkan et al., 2018; Doğa Koruma Merkezi, 2018). In the Climate Change and Climate Change Adaptation Strategy and Action Plans, there are objectives for determining the carbon sequestration potential of steppe areas and determining and monitoring the effects of climate change on steppe ecosystems and developing adaptation measures (Çevre ve Şehircilik Bakanlığı, 2011a, 2011b, 2011c). In addition, the objectives and actions related to agriculture and food security, land use, forestry, water resources management, ecosystem services and biodiversity contribute to the conservation and sustainable management of steppe ecosystems. NSAPCD includes outputs and actions directly related to the improvement of steppe ecosystems, increasing management efficiency and ensuring their representation in the protection system (Orman ve Su İşleri Bakanlığı, 2015).

In the remaining Strategy and Action Plans specified in Annex 1, the term "steppe" is not mentioned, and there is no policy and measure directly related to steppe ecosystems. On the other hand, all Strategy and Action

Plans include indirect goals and actions that can contribute to the conservation and sustainable management of steppe ecosystems under the subjects of agriculture and food security, forestry, land use, climate change and adaptation, rangeland and animal husbandry management, rural development, environmental protection, natural resource management, water management, drought, biodiversity and ecosystem services.

Institutional Plans and Programs

In the Strategic Plan of the Ministry of Agriculture and Forestry (2019-2023), the term "steppe" is not mentioned, but the terms "meadow" and "rangeland" are mentioned. This Strategic Plan includes goals and strategies that can contribute to the conservation and management of steppe ecosystems under the objectives of increasing welfare in rural areas, increasing productivity and quality in agricultural production, sustainable management of soil and water resources, combating climate change, desertification and erosion, and conservation and sustainable management of biodiversity (Tarım ve Orman Bakanlığı, 2018a). The Strategic Plan of the General Directorate of Forestry (2019-2023) aims to prevent soil erosion and reduce grazing pressure by carrying out rehabilitative activities in the rangelands in the forests, forest edges and upper tree lines which are used as rangelands but cannot be transformed into forestlands (Tarım ve Orman Bakanlığı, 2018b). In the resolutions of the III. Agriculture and Forestry Council (2019), there is reference to the determination, conservation, improvement and monitoring of natural resources and biodiversity, especially the sustainable management and implementation of agricultural fields and rangelands (Tarım ve Orman Bakanlığı, 2019b).

Regional Plans and Programs

With the 2021-2023 Regional Development Programs prepared by the Southeastern Anatolia Project (GAP) Regional Development Administration, Eastern Anatolia Project (DAP) Regional Development Administration, Konya Plain Project (KOP) Regional Development Administration, and Eastern Black Sea Project (DOKAP) Regional Development Administration operating under the Ministry of Industry and Technology, leading the development and advancement in the regions in terms of social and economic aspects is aimed. In addition, regional plans prepared by the Development Agencies coordinated by the Ministry of Industry and Technology also contribute to reducing interregional inequalities and ensuring regional development.

The Regional Development Programs prepared by the Regional Development Administrations and the regional plans prepared by the Development Agencies in the Level-2 Regions including the steppe areas are as follows:

- Southeastern Anatolia Project (GAP) Regional Development Program (2021-2023)

- Eastern Anatolia Project (DAP) Regional Development Program (2021-2023)

- Konya Plain Project (KOP) Regional Development Program (2021-2023)

- Eastern Black Sea Project (DOKAP) Regional Development Program (2021-2023)

- Ahiler Development Agency, Ankara Development Agency, Dicle Development Agency, Eastern Anatolia Development Agency, Fırat Development Agency, İpekyolu Development Agency, Karacadağ Development Agency, Northeast Anatolia Development Agency, Mevlana Development Agency, Central Anatolia Development Agency, Serhat Development Agency "Regional Plans" (2014-2023)

In the programs of the Regional Development Administrations, the term "steppe" is not mentioned and there is no policy and measure directly related to steppe ecosystems. However, the following Sectoral Operational Programs within the mentioned Regional Development Programs are related to the National Steppe Conservation Strategy and Action Plan in terms of their subjects.

- Mainstreaming Innovative and Competitive Practices in Agriculture, Efficiency in Agriculture and Agricultural Industry, Mainstreaming Precision Agriculture and Sustainable Practices, Agricultural Education and Extension, Integrated Rural Development, Development of Livestock Infrastructure, Use of Renewable Energy Resources and Increasing Energy Efficiency and Tourism Infrastructure Strengthening Programs included in the GAP Regional Development Program).

- Irrigation, Increasing Forage Crops Production, Rangeland Support, Development of Beekeeping, Rural Development, Agricultural Organization and Support of Production-Sales and Marketing of Local Products and Agricultural Education and Extension Programs included in the DAP Regional Development Program.

- Water Management, Increasing Agricultural Water Potential, Agricultural Education and Extension, Rural Development, Agricultural Organization and Supporting the Production-Sales and Marketing of Local Products, Agricultural Research, Supporting Modern Livestock, Bringing Animal Wastes to Agriculture, Strengthening the Tourism Infrastructure and Renewable Energy and Energy Efficiency Programs included in the KOP Regional Development Program.

- Small Scale Irrigation Works, Supporting Production of High Value Added Crop Products, Development of Beekeeping, Rural Development, Agricultural Organization and Supporting the Production-Sales and Marketing of Local Products, Agricultural Education and Extension and Tourism Development Programs included in the DOKAP Regional Development Program.

Although the regional plans prepared by the Development Agencies do not contain the words "steppe", they mostly include priorities and measures related to the conservation of biological diversity and sensitive ecosystems. Meadow and pasture areas stand out in regional plans, and almost all plans include priorities and measures regarding the improvement of meadow-rangeland areas, sustainable use, and management of rangelands.

2.8.2. Institutional Structure and Capacity in the Conservation and Management of the Steppes

In Turkey, there is no specific institutional structure authorized and responsible for the management of steppe ecosystems. The steppe ecosystems comprise natural steppes, meadows, and rangelands, and the steppes with trees and are managed through authorities and responsibilities of different institutions under different laws and regulations. The studies on the conservation and management of steppes are mainly performed by two ministries, namely Ministry of Agriculture and Forestry and Ministry of Environment and Urbanization. These studies are carried out by various general directorates and affiliated provincial directorates.

The General Directorate of Nature Conservation and National Parks (GDNCNP) (Ministry of Agriculture and Forestry) and the Regional Directorates of NCNP are responsible for inventory, research, conservation, planning and management, rehabilitation, restoration and monitoring activities related to biodiversity and protected areas as well as regulation of terrestrial hunting, operation and control of hunting resources. It is a key institution in terms of conservation and sustainable management of steppe biodiversity, and establishment and management of protected areas representing steppes. The inventory and monitoring studies carried out in 81 provinces in order to take the inventory of biodiversity in Turkey and monitor the species and habitats that are determinants of changes in ecosystem dynamics provide an important base for determining and recording steppe biodiversity. Even though there is no protected area status specially for steppes in Turkey, steppe ecosystems are included in existing protected areas such as National Park, Natural Park, Natural Monument, Nature Reserve, Wetland of National Importance, Wetland of Local Importance, and Wildlife Reserve. In this respect, inclusion of potential steppe areas in protected areas and protection of steppe species and habitats within the existing protected areas, and preparation, implementation and monitoring of species action plans for steppe species are of great importance.

The General Directorate of Forestry (GDF) (Ministry of Agriculture and Forestry) and the Regional Directorates carry out rehabilitative measures for glades located in forests, forest-edges, and upper tree lines and also in rangelands, summer pastures, winter pastures and grasslands located in the areas where afforestation, soil conservation, and basin improvement activities are carried out. The General Directorate is responsible for the conservation, care and improvement of rangelands, summer pastures, winter pastures and grasslands in the forests, forest edges and upper tree lines of the forests, which are used as rangelands but cannot be converted into forestlands. In these areas, rangeland improvement studies with cultural and technical measures (fertilization, artificial insemination, erosion control etc.) are carried out as well as regulation and planning of grazing. These studies put responsibilities on GDF for in-forest rangelands, that is to say steppe areas.

The General Directorate of Plant Production (GDPP), the General Directorate of Livestock (GDL), the General Directorate of Agrarian Reform (GDAR), the Agriculture and Rural Development Support Institution (ARDSI), the General Directorate of Agricultural Research and Policies (GDARP), and the General Directorate of Agricultural Enterprises (GDAE) under the Ministry of Agriculture and Forestry are the authorized institutions for the sustainable management of natural resources offered by steppe ecosystems used as agricultural fields and rangelands.

Duties of the **GDPP** include increasing the plant production, plant productivity and plant diversity, developing and disseminating organic agriculture and good agricultural practices, popularizing the conscious use of fertilizers based on soil analyses, determination and development of agricultural basins, establishing basin-based production policies, conducting research on water, soil, environment, climate change, cultivation techniques, harvesting and storage, and contributing to improvement and conservation of meadows, rangelands and pastures.

In this context, the GDPP Department of Meadow-Rangeland and Forage Crops and the Department of Good Agricultural Practices and Organic Farming conduct studies that directly contribute to conservation of steppe ecosystems. The Department of Meadow-Rangeland and Forage Crops works on the determination, delimitation and allocation of rangelands, summer pastures, winter pastures, general grasslands and meadows, increasing the production of perennial forage crops and establishing sown pastures. The authority to carry out activities related to rangelands is given to the Ministry of Agriculture and Forestry at the central level and to the Provincial Pasture Commissions at the provincial level The Rangeland Improvement and Management Projects are carried out collaboratively by the Ministry of Agriculture and Forestry, universities and research institutes. In addition, the training and extension activities are carried out for villagers and shepherds. The Rangeland Information System (RIS) is an important system in which rangeland areas are recorded, visualized and monitored via satellite images.

Supports provided within the scope of the Environmentally-Friendly Agricultural Land Protection Program (EFALP) managed by the GDPP set a model for the dissemination of eco-friendly agricultural practices. Such practices support the steppe creatures that use agricultural fields and contribute to reducing the pressure of intensive farming practices on the surrounding natural steppe areas.

Among the duties of the **GDL** are improvement of animal husbandry and livestock production, dissemination of high-quality animal breeds, encouraging animal production with methods that protect human health and ecological balance, implementation of livestock improvement programs, and marketing of animal products. Supporting animal breeding in a way to keep the quality of rangelands, performing rotational grazing by determining the stocking capacity, and creating subsidy models for the sustainable management of rangelands in order to reduce the grazing pressure on rangelands are important efforts for the conservation and sustainable management of the steppes used as rangelands.

The **GDAR** is responsible for taking the necessary measures to protect agricultural fields and ensuring their proper use as well as performing land and soil surveys, classification and mapping, preparing land use plans for agricultural purposes or having them prepared, managing agricultural product planning and supports, increasing productivity in agricultural irrigation, ensuring the use of proper irrigation techniques, and paving the way for working on global climate change, drought and desertification.

Sustainable land management and climate-smart agricultural practices, conservation of agricultural biodiversity and increasing the adaptative capacity to climate change in agricultural practices implemented within the scope of the Strategy and Action Plan to Combat Drought (2018-2022) under the coordination of the Agricultural Drought Management Coordination Board, whose secretariat and coordination is assumed by the GDAR, are important studies (Gıda, Tarım ve Hayvancılık Bakanlığı, 2018). Determining the agricultural support framework, priority issues and support items and the amount, and directing agricultural supports within the Agricultural Supports and Steering Board, whose secretariat and coordination is assumed by the GDAR Department of Agricultural Supports, offer opportunities for conservation of steppe biodiversity.

The Instrument for Pre-Accession Assistance for Rural Development (IPARD) is operated by the **ARDSI** in order to compensate for the income losses arising from the producer's commitments to protect the environment and natural resources. With the Agricultural and Environmental Measures within the scope of the program, it is aimed for farmers to adopt more eco-friendly and sustainable practices that can support the conservation of soil, underground waters, surface waters, biodiversity and agricultural fields with high natural value. It provides an important opportunity for economically supporting the rural population in steppe areas and promoting economic activities and production methods suitable for these areas. In this context, a precaution program is being developed to support the great bustard (Otis tarda) friendly agricultural practices, which is an endangered steppe bird, in selected agricultural fields in Polatlı, Ankara.

The **GDARP and its affiliated Research Institutes** are responsible for preparing and managing research projects on agricultural fields, vineyards-orchards, meadows-rangelands and forage crop production resources, biodiversity and genetic resources, effective use of soil and water resources, soil moisture conservation, biological fertilizers, biological pest management, land degradation, erosion, drought and climate change.

Konya Soil Water and Desertification Research Institute works on the conservation of natural resources, and biodiversity, and determining the plant species resistant to semi-arid areas. Bahri Dağdaş International Agricultural Research Institute and Drought Test Centre conducts research on cereals, cash crops, edible legumes, medicinal and aromatic plants, meadow-rangeland forage crops, fruit growing, vegetable growing, biodiversity, genetic resources and animal husbandry. The Aegean Agricultural Research Institute (AARI) and Field Crops Central Research Institute are the leading institutes responsible for the conservation (generally ex-situ) and management of plant genetic diversity. The National Genebank, Turkey Seed Genebank, and a herbarium were established within these institutes. These studies contribute to the conservation and sustainable use of steppe biodiversity and genetic resources.

The **GDAE** is responsible for transferring the seeds, saplings, seedlings and similar goods that it grows, and the breeding animals and the semen, to the breeders in order to increase and diversify the production of crops and animals and to improve the product quality. In agricultural practices to be carried out in enterprises where steppe ecosystems and related species exist, it is important to promote the breeding of local plant and animal species, implement eco-friendly practices and protect natural and semi-natural steppe ecosystems.

The **General Directorate of Combating Desertification and Erosion (GDCDE), the General Directorate of State Hydraulic Works (GDSHW), the General Directorate of Water Management (GDWM),** and **the General Directorate of Meteorology (GDM)** under the Ministry of Agriculture and Forestry are also other relevant institutions that have direct and indirect plans and programs for the conservation of steppe ecosystems. The **Department of Education and Publishing (Ministry of Agriculture and Forestry)** makes a significant contribution to in-service and non-public agricultural training and extension activities by observing the biodiversity values of the steppes and sustainable resource use and including them in training programs.

The **Ministry of Environment and Urbanization and the Provincial Directorates of Environment and Urbanization** are the main institutions responsible for landscape planning, in addition to many other roles. The General Directorate of Spatial Planning has an important position in this regard. In this context, the institution is currently preparing landscaping plans and integrated coastal area plans, and the Spatial Strategy Plan preparation studies, which will bring a landscape planning perspective into the practice in the near future, still continue. With their powers and responsibilities, the General Directorate of Environmental Management for prevention of environmental pollution and adaptation to climate change and the General Directorate for Protection of Natural Assets for registration, approval and announcement of protected areas and especially for the determination, registration and approval of special protected areas and natural protected areas under its authority and management of biodiversity and habitats in these areas are two important bodies considering the steppe ecosystems.

The **Ministry of National Education** for non-formal and formal education, The **Ministry of Industry and Technology** for inclusion of priorities regarding steppes in regional plans and programs, **Academic Institutions** for human resource, research and technology development, Chambers of Agriculture, Producer Organizations

and Producer Unions, **Non-Governmental Organizations** (especially those working on nature conservation) for adoption and dissemination of measures related to nature conservation and sustainable resource use, and the **Private Sector** for implementation and financial support are important stakeholders considering conservation and sustainable management of steppes.

Local Governments are also important stakeholders in terms of planning and management authorities at local level and supporting agricultural and rural services that uphold sustainable resource use. With the "Law No. 6360 on the Establishment of Metropolitan Municipalities and Twenty-seven Districts in Fourteen Provinces and Amendments to Certain Laws and Decree Laws", which was adopted on 06/12/2012 and names and some articles of which were changed with the Law No. 6447 of 14/03/2013, Metropolitan municipalities were established in Aydın, Balıkesir, Denizli, Hatay, Malatya, Manisa, Kahramanmaraş, Mardin, Muğla, Tekirdağ, Trabzon, Şanlıurfa, Van and Ordu provinces with a total population of over 750,000. The borders of Adana, Ankara, Antalya, Bursa, Diyarbakır, Eskişehir, Erzurum, Gaziantep, İzmir, Kayseri, Konya, Mersin, Sakarya and Samsun metropolitan municipalities were extended to the provincial administrative borders. The legal entity statuses of the special provincial administrations in the provinces of Istanbul and Kocaeli, as well as the 28 provinces mentioned above, were removed. In addition, the legal entities of village and town municipalities in these provinces were abolished and they were attached to the municipality of the related district. Consequently, the metropolitan municipality administration showed an expansion from city administration to area administration. As a result, local governments together with the Ministry of Environment and Urbanization started to have an important authority in reducing the pressure created by construction works on agricultural areas, rangelands and forests and preventing the misuse of these areas. New measures should be taken in order to protect rangelands, summer pastures, winter pastures and public pastures and meadows from construction pressure, especially after the extension of the metropolitan municipality borders to the provincial borders.

Although there is no single institutional structure responsible for the conservation and management of steppes in Turkey, there is capacity and various mechanisms within different institutions. In this regard, institutional cooperation becomes even more important for the conservation and management of steppes. In addition, in order to prevent duplication of efforts and to ensure coordination of works between these institutions, capacity should be increased, and efforts should be made more effectively through information sharing and coordination. In this direction, organizational structuring under different strategic purposes, capacity increase and coordination should be prioritized. Moreover, in the Governance Section, recommendations for the establishment of a governance structure that can enable more effective work are presented.

2.8.3. Assessment of Legislation and Institutional Responsibilities on the Conservation and Management of Steppes

In this part of the Strategy and Action Plan, laws and regulations related to the conservation and management of the steppes as well as the duties and responsibilities of the key institutions in this field are covered. DKM experts made various evaluations in this context. Firstly, an organogram showing central and local level institutions was prepared (Figure 11). Secondly, by examining together the legislation and the duties and responsibilities of institutions, the overlaps and gaps in key issues related to the conservation and management of the steppes were revealed. In Table 5 produced for this purpose, the legislation and institutional responsibilities were evaluated in two different axes under the key topics related to the conservation and management of the steppes. The evaluation made in terms of laws and regulations is shown in the main axis of the table. For the sections, the cells with relevant legislation are shown in green color. In addition, the institutional responsibilities under different topics are specified in the bottom column of the table. The evaluation of the duties and responsibilities of institutions is based on the evaluation results of the survey study conducted with participating institutions in the First National Steppe Conservation Workshop held in Şanlıurfa on 2-3 December 2019, within the scope of the Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project. In the study in question, the extent of overlapping duties and responsibilities of different institutions and the importance of cooperation for the sustainable management of the steppes stood out. The results of this evaluation, in which 90 experts from the First National Steppe Conservation Workshop participated, are presented in Annex 2.

Central

Local

Research Institutions, Universities, NGOs, Professional Associations

Agricultural practices supporting biological diversity

DG of Agricultural Reform (TRGM) Sustainable land management and climate-friendly agricultural practices, conservation of agricultural biological diversity

DG of Agricultural Research and Policies (TAGEM) Research of nature friendly agricultural practices

DG of Plant Production (BÜGEM) Development and dissemination of organic and good agricultural practices ÇATAK

Agricultural and Rural Development Support Institution (TKDK) Supporting environment friendly and sustainable agricultural practices

Regional Development Administrations

Development Agencies

Municipalities

Universities, NGOs, Professional Associations

Department of Training and Publication (EYDB) In-service and non-public agricultural training and dissemination

Sustainable use of natural resources

Rangeland Management

DG of Livestock (HAYGEM) Supporting livestock breeding suitable for grazing capacity

DG of Combating Desertification and Erosion (ÇEM)

DG of Agricultural Enterprises (TIGEM)

DG of Forestry (OGM) Protection of in-forest and forest edge rangelands

DG of Plant Production (BÜGEM) Determination, limitation and allocation of rangelands, Improvement of rangelands, Forage crop production, Grazing planning

DG of Agricultural Research and Policies (TAGEM) Meadow-rangeland forage crops and rangeland improvement researches

Regional Directorates of Forestry

Provincial Rangeland Commissions

Technical Teams →

Rangeland Management Unions/ Village Headmen

Ministry of Agriculture and Forestry

Conservation of biological diversity

DG of Livestock (HAYGEM) Conservation of animal genetic resources

DG of Plant Production (BÜGEM) *Ex-situ* conservation of steppe plant genetic resources

DG of Agricultural Research and Policies (TAGEM) *Ex-situ* conservation of steppe plant genetic resources

DG of Nature Conservation and National Parks (DKMPGM) Planning and management of protected areas Conservation of steppe species and their habitats *In-situ* conservation of genetic resources of steppe species

DG of Forestry (OGM)

Ministry of Environment and Urbanization General Directorate for Protection of Natural Assets

Provincial Directorates of Agriculture and Forestry

Soil Conservation Boards

Research Institutes affiliated to TAGEM

MoAF Regional Directorates NCNP Provincial Directorates

Figure 11. Institutional structure scheme

Table 5. Assessment of Legislation and Institutional Responsibilities on the Conservation and Management of Steppes

Legislation columns (left to right):
1. Law on Pasture
2. Regulation on Pasture
3. Forest Law
4. Forest Management Regulation
5. National Afforestation and Erosion Control Mobilization Law
6. Regulation on Afforestation
7. Reg. on Forest Services on Afforestation and Erosion Control
8. Environment Law
9. National Parks Law
10. Land Hunting Law
11. Cultural and Natural Heritage Prot. Act
12. Wetland Conservation Regulation
13. Reg. on Proc. and Prin. of Determ., Registr. and Approval of Protected Areas
14. Agriculture Law
15. Agricultural Basins Regulation
16. Reg. on Good Agricultural Practices
17. Soil Pres. and Land Util. Law and Amend. Law
18. Regulation on the Conservation, Use and Planning of Agricultural Land
19. Reg. on Supporting and Providing Technical Assistance to Producers
20. Organic Farming Law and Reg. on the Princi. and Applic. of Organic Farming
21. Agrarian Reform Act for Land Arrangements in Irrigation Areas
22. Applic. Reg. on Land Consolidation and On-Farm Development Services
23. By-Law on Prep., Implementation, Monitoring and Rev. of Basin Management Plans
24. Biosafety Law
25. Veterinary Services, Plant Health, Food and Feed Law
26. Seed Law
27. Reg. on the Collection, Production, and Export of Natural Flower Bulbs from Nature

SUBJECT HEADINGS	Marked legislation columns (green)	INSTITUTIONS (*Principal Institution, **Related Institutions)
Conservation of important species*	3, 4, 8, 9, 10, 11, 12, 13, 14, 27	*GDNCNP **GDF-GDARP-GDPP-GDL
Conservation of plant genetic resources*	3, 4, 8, 9, 11, 12, 13, 14, 24, 25, 26	*GDARP-GDPP **GDNCNP GDF-GDL
Conservation of animal genetic resources	3, 4, 5, 8, 9, 11, 12, 13, 14, 24, 25	*GDARP-GDNCNP-GDL (livestock) **GDPP-GDF
Conservation of vegetation	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 18, 19, 20, 21, 22, 23	*GDNCNP-GDPP-GDF **GDARP-GDL
Conservation of in-forest/ forest-edge rangelands/ steppes	3, 4, 6	*GDF **GDPP-GDNCNP-GDARP-GDL
Conservation of plant species composition - Forage crop diversity*	2, 14, 20	*GDPP **GDARP-GDNCNP-GDF-GDL
Conservation of plant species composition – Species diversity*	3, 9, 13	*GDPP-GDNCNP **GDARP-GDF-GDL
Conservation of soil (including erosion in forest, agricultural fields)	1, 2, 3, 4, 5, 6, 7, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	*GDF-GDPP-GDARP-GDAR- GDCDE **GDNCNP-GDL
Grazing planning	1, 2, 4, 9	*GDPP-GDL **GDF-GDARP-GDNCNP
Determining the carrying capacity of rangelands	2	*GDPP-GDL **GDARP-GDF-GDNCNP
Determining the number and type of animals to graze	1, 2, 3, 9	*GDL-GDPP **GDARP-GDF-GDNCNP

LEGISLATION ON THE CONSERVATION AND MANAGEMENT OF STEPPES

SUBJECT HEADINGS	Law on Pasture	Regulation on Pasture	Forest Law	Forest Management Regulation	National Afforestation and Erosion Control Mobilization Law	Regulation on Afforestation	Reg. on Forest Services on Afforestation and Erosion Control	Environment Law	National Parks Law	Land Hunting Law	Cultural and Natural Heritage Prot. Act	Wetland Conservation Regulation	Reg. on Proc. and Prin. of Determ., Registr. and Approval of Protected Areas	Agriculture Law	Agricultural Basins Regulation	Reg. on Good Agricultural Practices	Soil Pres. and Land Util. Law and Amend. Law	Regulation on the Conservation, Use and Planning of Agricultural Land	Reg. on Supporting and Providing Technical Assistance to Producers	Organic Farming Law and Reg. on the Princi. and Applic. of Organic Farming	Agrarian Reform Act for Land Arrangements in Irrigation Areas	Applic. Reg. on Land Consolidation and On-Farm Development Services	By-Law on Prep., Implementation, Monitoring and Rev. of Basin Management Plans	Biosafety Law	Veterinary Services, Plant Health, Food and Feed Law	Seed Law	Reg. on the Collection, Production, and Export of Natural Flower Bulbs from Nature	INSTITUTIONS * Principal Institution ** Related Institutions
Allocation of rangelands (areas with important species in general and forest regime)		X																										*GDPP-GDF **GDL-GDARP-GDNCNP
Prevention of out-of purpose use (quarry, solar power plant, afforestation, etc.)	X	X	X		X	X	X	X	X	X	X						X					X	X					*GDPP-GDF-GDNCNP **GDARP-GDL
Research on improvement and rehabilitation of steppes or rangelands	X	X																										*GDARP-GDPP **GDF-GDNCNP- GDL
Implementation of the improvement and rehabilitation of steppe or rangelands	X				X	X					X	X																*GDPP-GDNCNP-GDCDE ** GDARP-GDF-GDL
Agricultural practices supporting biodiversity														X	X	X			X									* GDPP-GDAR-ARDSI ** GDARP-GDNCNP (protected areas)

*It is important to divide the conservation of important species and plant genetic resources into in-situ and ex-situ conservation and to define institutional responsibilities within this framework. There is need for better cooperation on these issues.

**Conservation of plant species composition is given under two different headings – forage crop diversity and species diversity - for the evaluation of duties and responsibilities separately. Nevertheless, there is need for cooperation due to overlaps in institutional powers in important areas for both forage crop diversity and biodiversity.

3. The Spatial Assessments Regarding the Steppes of Turkey

3.1. Current situation: The Conservation and Management of the Steppes

As shown in detail in Section 2.3, the zone with potential steppe and steppe forest (areas with sparse or dense forests in ecological regions dominated by steppes) ecosystems in Turkey cover an area of approximately 33.5 million hectares. According to an up-to-date analysis made by Doğa Koruma Merkezi, the potential steppe zone spans approximately 17 million ha of steppes and 552,334 ha of steppe forests.

As for the distribution of steppes according to the geographical regions of Turkey, of all steppes and steppe forests (17.5 million ha), 42% is in Central Anatolia, 36% in Eastern Anatolia, 14% in Southeastern Anatolia, 5% in the Black Sea region, 2% in the Mediterranean Region and 1% in the Aegean Region (Table 6).

Table 6. Distribution of the steppes and steppe forests by geographical regions

Geographical Region Name	Steppe area (ha)	Steppe forest (ha)	Ratio (%)*
Central Anatolia	7,100,719	286,857	42
Eastern Anatolia	6,240,417	87,486	36
Southeastern Anatolia	2,401,139	10,283	14
Black Sea	760,401	165,339	5
Mediterranean	320,070	1,028	2
Aegean	208,136	1,341	1

The ratio shows the distribution of the steppes and steppe forests by geographical regions.

Secondly, for each province, the size of the area covered by steppes within the totality of the potential steppe zone and its ratio to the provincial surface area were assessed. As to the steppes that cover the largest areas on a provincial basis, it was determined that Sivas, Konya, Van and Erzurum hosted steppe vegetation in the largest areas (total steppe areas in these provinces are respectively 1,539,635 ha, 1,355,367 ha, 1,282,438 ha, 1,041,766 ha; Table 7, Figure 12). The provinces with the highest ratio of areas with steppe vegetation in comparison to the provincial area are Iğdır (70%), Bayburt (63%) and Ağrı (61%).
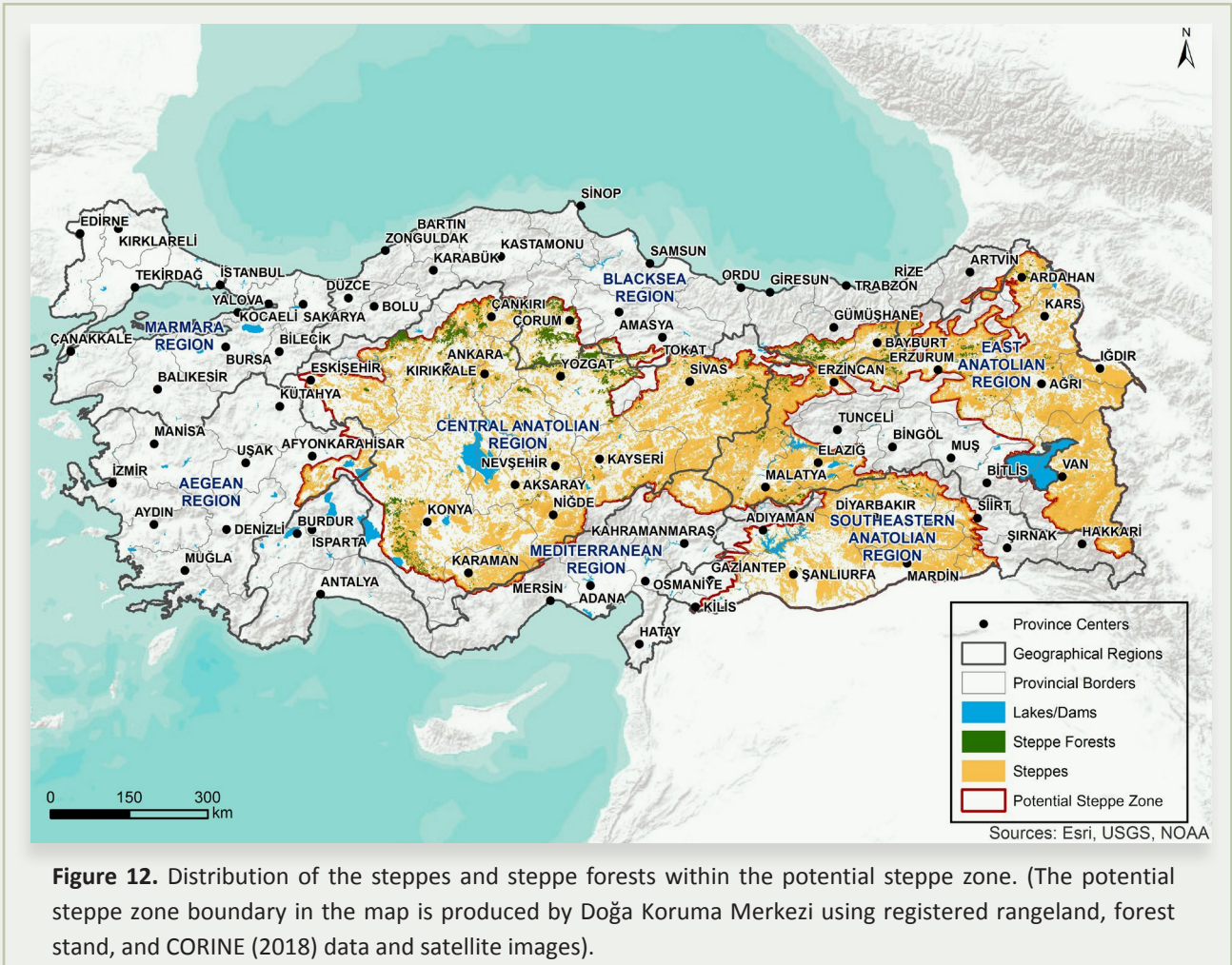
Figure 12. Distribution of the steppes and steppe forests within the potential steppe zone. (The potential steppe zone boundary in the map is produced by Doğa Koruma Merkezi using registered rangeland, forest stand, and CORINE (2018) data and satellite images).

Table 7. Distribution of the steppe area, steppe forest area, registered rangeland area, agricultural fields, number of livestock and population in the provinces within the potential steppe zone

Province Name[+]	Geographic Region Name	Area (ha)	Area in potential steppe zone (ha)	Overlaping with the potential steppe zone (%)*	Steppes (ha)	Steppe forests (ha)	Ratio of the steppe area in the province (%)**	Ratio of steppe forests in the province (%)**	Area of registered rangelads (ha)***	Area of agricultural fields (ha)****	Number of bovine animals	Number of ovine animals	Population
Sivas	Central Anatolia	2,854,651	2,351,212	82	1,539,635	36,217	54	1	670,039	728,624	357,866	578,436	646,608
Konya	Central Anatolia	4,078,657	3,515,033	86	1,355,367	49,732	33	1	563,926	1,873,503	921,572	2,252,461	2,205,609
Van	Eastern Anatolia	2,113,101	1,835,381	87	1,282,438	314	61	0.01	1,024,791	310,940	177,346	2,650,531	1,123,784
Erzurum	Eastern Anatolia	2,523,960	1,614,397	64	1,041,766	30,746	41	1	503,642	512,572	768,997	746,733	767,848
Kayseri	Central Anatolia	1,693,642	1,518,418	90	799,554	6,999	47	0.41	341,370	647,254	349,696	647,093	1,389,680
Ankara	Central Anatolia	2,546,883	2,185,546	86	775,040	64,342	30	3	103,533	1,158,225	538,755	1,581,795	5,503,985
Şanlıurfa	Southeastern Anatolia	1,941,343	1,939,577	100	761,688	1,714	39	0.09	273,654	1,100,575	352,084	2,148,664	2,035,809
Malatya	Eastern Anatolia	1,240,080	1,090,465	88	745,089	16,161	60	1	135,486	295,551	174,321	338,433	797,036
Ağrı	Eastern Anatolia	1,156,208	1,148,918	99	710,892	2,687	61	0.23	16,023	393,019	388,452	1,322,805	539,657
Diyarbakır	Southeastern Anatolia	1,539,831	1,395,031	91	680,733	7,558	44	0.49	121,448	658,314	589,462	1,834,639	1,732,396
Erzincan	Eastern Anatolia	1,172,606	770,241	66	581,876	21,179	50	2	215,999	149,071	114,915	434,457	236,034
Mardin	Southeastern Anatolia	874,263	873,868	100	535,602	9	61	0.00	36,558	322,137	116,825	975,482	829,195
Kars	Eastern Anatolia	1,029,913	953,79	93	498,964	4,729	48	0.46	54,091	420,362	450,101	456,500	288,878
Elazığ	Eastern Anatolia	932,036	741,129	80	483,141	3,666	52	0.39	67,117	184,503	187,418	698,745	595,638
Niğde	Central Anatolia	703,916	645,637	92	399,871	1,707	57	0.24	120,236	230,149	172,477	572,969	364,707
Karaman	Central Anatolia	883,838	606,054	69	389,134	627	44	0.07	145,010	210,920	68,266	662,853	251,913
Yozgat	Central Anatolia	1,343,228	1,202,100	89	357,009	73,961	27	6	72,993	747,419	247,809	378,798	424,981
Eskişehir	Central Anatolia	1,411,628	835,248	59	327,543	3,337	23	0.24	135,004	470,619	155,273	800,732	871,187

Province Name[+]	Geographic Region Name	Area (ha)	Area in potential steppe zone (ha)	Overlapping with the potential steppe zone (%)*	Steppes (ha)	Steppe forests (ha)	Ratio of the steppe area in the province (%)**	Ratio of steppe forests in the province (%)**	Area of registered rangelads (ha)***	Area of agricultural fields (ha)****	Number of bovine animals	Number of ovine animals	Population
Aksaray	Central Anatolia	778,835	778,835	100	267,922	1,214	34	0.16	140,285	404,889	266,483	678,635	412,172
Kahramanmaraş	Mediterranean	1,431,759	422,339	29	267,312	543	19	0.04	131,058	143,372	215,223	837,589	1,144,851
Çankırı	Central Anatolia	749,580	474,404	63	260,143	32,725	35	4	93,015	175,348	151,099	129,203	216,362
Iğdır	Eastern Anatolia	365,994	364,312	100	257,168	84	70	0.02	81,469	95,863	150,633	1,028,322	197,456
Çorum	Black Sea	1,260,589	771,937	61	246,264	89,516	20	7	36,292	415,713	241,485	234,412	536,483
Bayburt	Black Sea	381,831	372,526	98	239,204	13,008	63	3	76,606	112,213	98,060	48,787	82,274
Ardahan	Eastern Anatolia	502,538	384,626	77	237,273	6,806	47	1	150,949	121,383	306,925	74,238	98,907
Kırşehir	Central Anatolia	665,495	665,495	100	235,120	6,549	35	1	70,404	381,718	223,145	277,170	241,868
Batman	Southeastern Anatolia	452,975	355,656	79	220,466	0	49	0	19,82	118,150	107,784	820,155	599,103
Afyonkarahisar	Aegean	1,397,484	490,555	35	208,136	1,341	15	0.10	18,352	244,027	391,507	949,973	725,568
Kırıkkale	Central Anatolia	487,683	487,683	100	199,762	8,892	41	2	43,053	260,501	73,216	135,102	286,602
Nevşehir	Central Anatolia	557,884	557,884	100	194,620	556	35	0.10	71,675	346,073	90,683	145,970	298,339
Hakkari	Eastern Anatolia	730,845	186,916	26	153,507	0	21	0	62,813	26,432	44,443	668,041	286,470
Gümüşhane	Black Sea	666,191	289,110	43	153,205	42,896	23	6	23,291	82,449	82,202	37,339	162,748
Şırnak	Eastern Anatolia	724,034	176,983	24	120,461	0	17	0	10,972	52,819	71,120	1,138,629	524,190
Siirt	Southeastern Anatolia	574,490	143,034	25	92,439	23	16	0.00	15,834	49,739	34,918	1,250,453	331,670
Adıyaman	Southeastern Anatolia	732,367	284,872	39	69,445	978	9	0.13	18,856	162,030	129,194	343,577	624,513
Muş	Eastern Anatolia	880,178	210,338	24	62,447	9	7	0.00	3,041	139,317	306,542	1,041,102	407,992
Tokat	Black Sea	989,639	142,446	14	50,333	10,638	5	1	8,600	76,820	310,431	390,190	612,646
Tunceli	Eastern Anatolia	770,334	86,320	11	44,107	0	6	0	3,740	19,316	33,939	368,089	88,198

Province Name[+]	Geographic Region Name	Area (ha)	Area in potential steppe zone (ha)	Overlapping with the potential steppe zone (%)*	Steppes (ha)	Steppe forests (ha)	Ratio of the steppe area in the province (%)**	Ratio of steppe forests in the province (%)**	Area of registered rangelads (ha)***	Area of agricultural fields (ha)****	Number of bovine animals	Number of ovine animals	Population
Giresun	Black Sea	704,641	60,987	9	35,512	7,817	5	1	4,977	15,608	112,481	106,101	453,912
Gaziantep	Southeastern Anatolia	681,469	197,564	29	33,541	0	5	0	9,714	155,290	271,879	625,949	2,028,563
Artvin	Black Sea	756,612	28,890	4	27,392	557	4	0.07	14,467	777	61,174	129,794	174,010
Mersin	Mediterranean	1,593,008	26,807	2	26,770	0	2	0	4,892	273	115,473	1,370,420	1,814,468
Adana	Mediterranean	1,414,060	33,603	2	24,220	435	2	0.03	5,852	7,962	265,430	807,900	2,220,125
Bitlis	Eastern Anatolia	834,613	234,012	28	16,727	1,077	2	0.13	10,216	40,009	94,880	645,291	349,396
Rize	Black Sea	397,291	8,046	2	8,038	0	2	0	6,367	0	25,480	27,660	348,608
Kilis	Southeastern Anatolia	141,223	55,641	39	7,226	0	5	0	2,188	45,721	12,999	210,009	142,541
Bingöl	Eastern Anatolia	817,262	5,216	1	4,561	27	1	0.00	0	424	132,772	510,781	281,205
Total***		**52,480,687**	**33,519,082**	-	**17,028,662**	**551,378**	-	-	**5,739,717**	**14,107,996**	**10,553,235**	**34,113,007**	**36,296,185**

[+] The ranking was made according to the size of the steppe. The registered rangeland areas in the table indicate data as of April 2020, and the population and animal statistics indicate data as of 2018.

* The provinces where the overlapping of provincial area with the potential steppe zone is <50% are shown in gray. The provinces where the overlapping is lower than 1% are not shown.

** In this ratio, the entire provincial area is taken into consideration.

*** The area of the registered rangelands within the potential steppe zone in the province is given.

**** The area of the agricultural fields within the potential steppe zone in the province is given. Agricultural field data were taken from CORINE 2018 Land Use and Land Cover (211,212,213,221,2 22,223,231,241,242,243,244 coded land classes). The methods applied to distinguish steppes and mixed agricultural fields are explained in Section 2.3. The lands that are not classified as steppes in these classes are regarded as agricultural fields.

***** In the table, the provinces with an overlapping of more than 1% with the potential steppe zone are shown and the data of these provinces are included in the total.

Another factor taken into consideration in the assessment is the population density of the provinces dominated by steppe vegetation. The total population of the provinces with a large amount (≥50%) of steppes is generally high and corresponds to approximately 29% of the population of Turkey (23.6 million). Among these provinces, Ankara, Konya and Şanlıurfa are the most densely populated ones, whereas Bayburt, Ardahan and Iğdır are the provinces with the lowest population density (Table 7). It is expected that the pressure on the steppes will be more intense in the provinces where the population is dense, and the settlements cover larger areas. According to CORINE 2018 Land Use and Land Cover Data, the settlements within the potential steppe zone covers 411,947 ha, corresponding to 1.4% of the total area of the potential steppe zone (Figure 13). In this context, it is safe to state that the human-induced pressure on the steppes is high in the provinces of Ankara, Konya, Şanlıurfa, Diyarbakır, Kayseri and Van, which host both dense populations and large steppe areas.

Figure 13. The settlement pressure on the steppe areas (17 million ha) within the potential steppe zone in Turkey. On this map, the settlements (411,947 ha) from the CORINE 2018 Land Use and Land Cover data are shown.
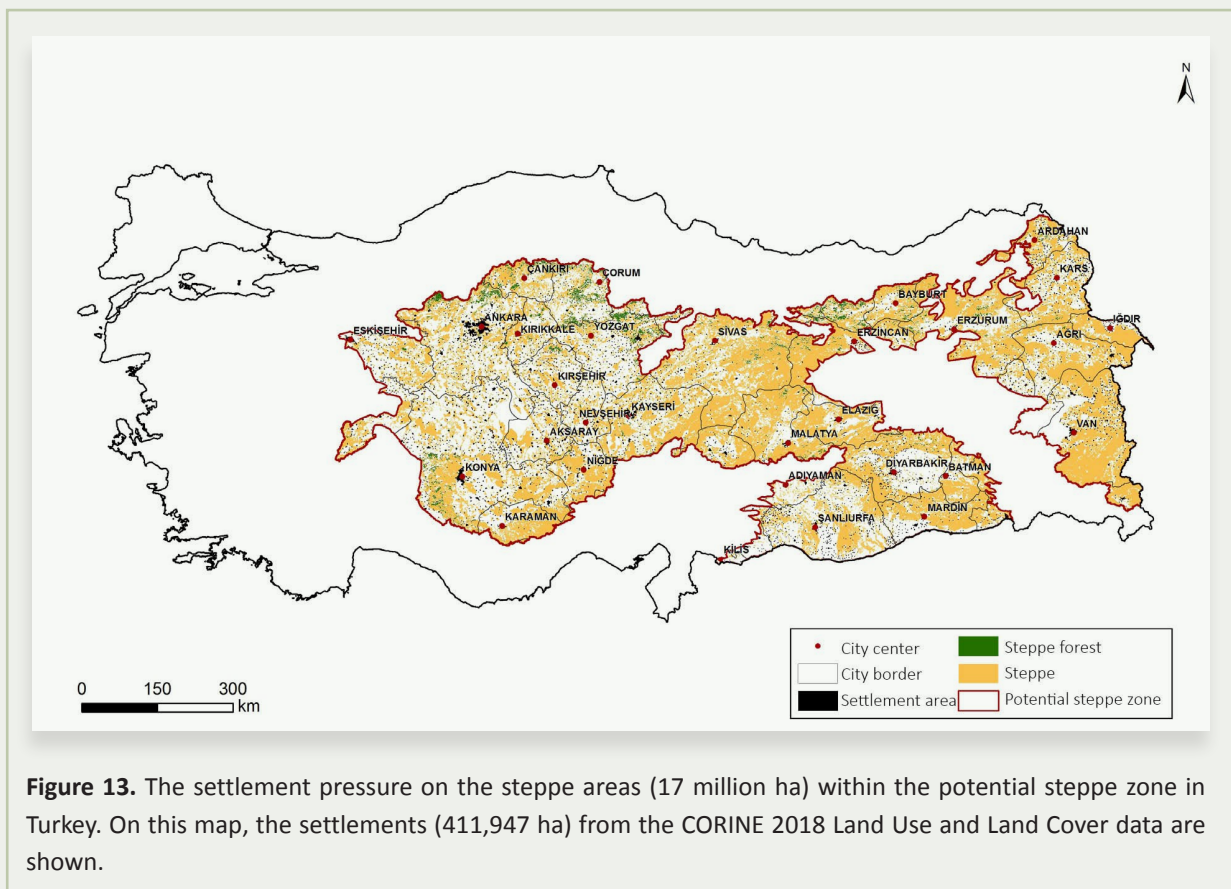
In addition to sourcing biodiversity, steppes are an important source of income for local people, as they are used as rangelands in livestock breeding. Across Turkey, the provinces where livestock breeding is practiced most frequently are located within the boundaries of the potential steppe zone. While the provinces with the highest number of livestock within the potential steppe zone are Konya, Van and Şanlıurfa (Figure 14, Table 7), the provinces where the registered rangelands span the largest areas are Van, Sivas and Konya (Figure 15, Table 7). Van and Konya stand out in terms of both large rangelands and high numbers of livestock. Registered rangelands within the potential steppe zone cover 5,739,717 ha.
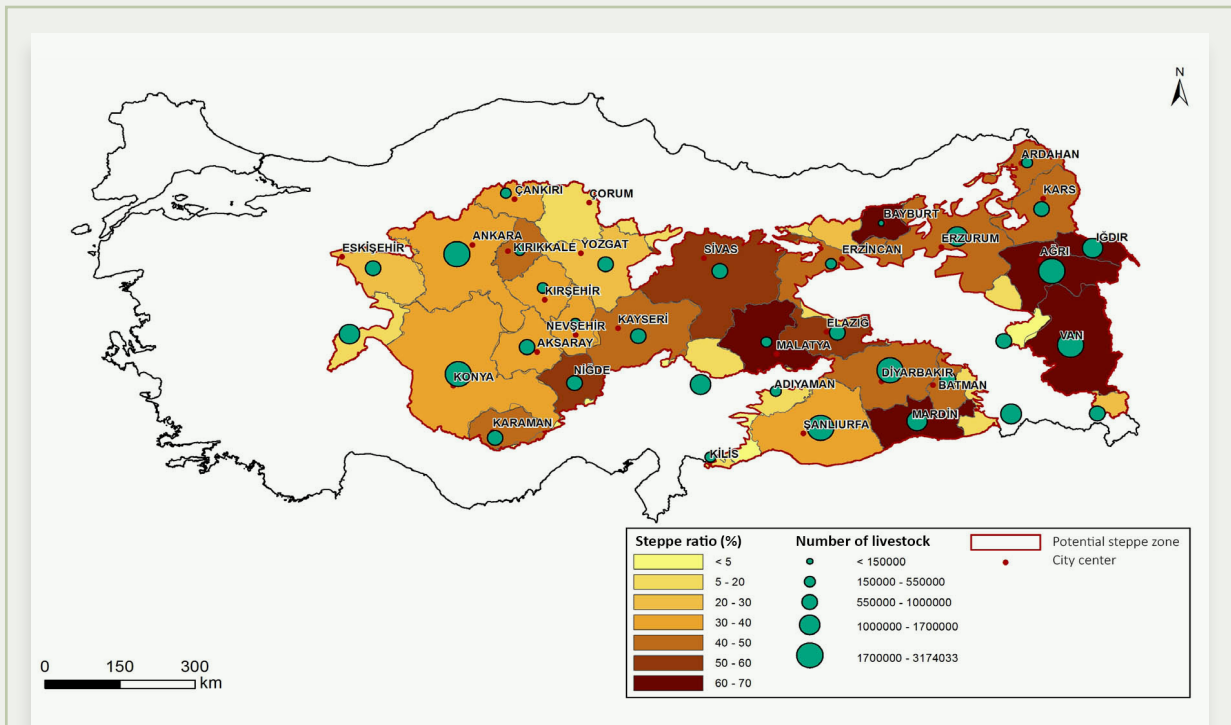
Figure 14. The ratio of steppe areas and the number of livestock on provincial basis within the potential steppe zone in Turkey (Data Source: TÜİK livestock statistics)
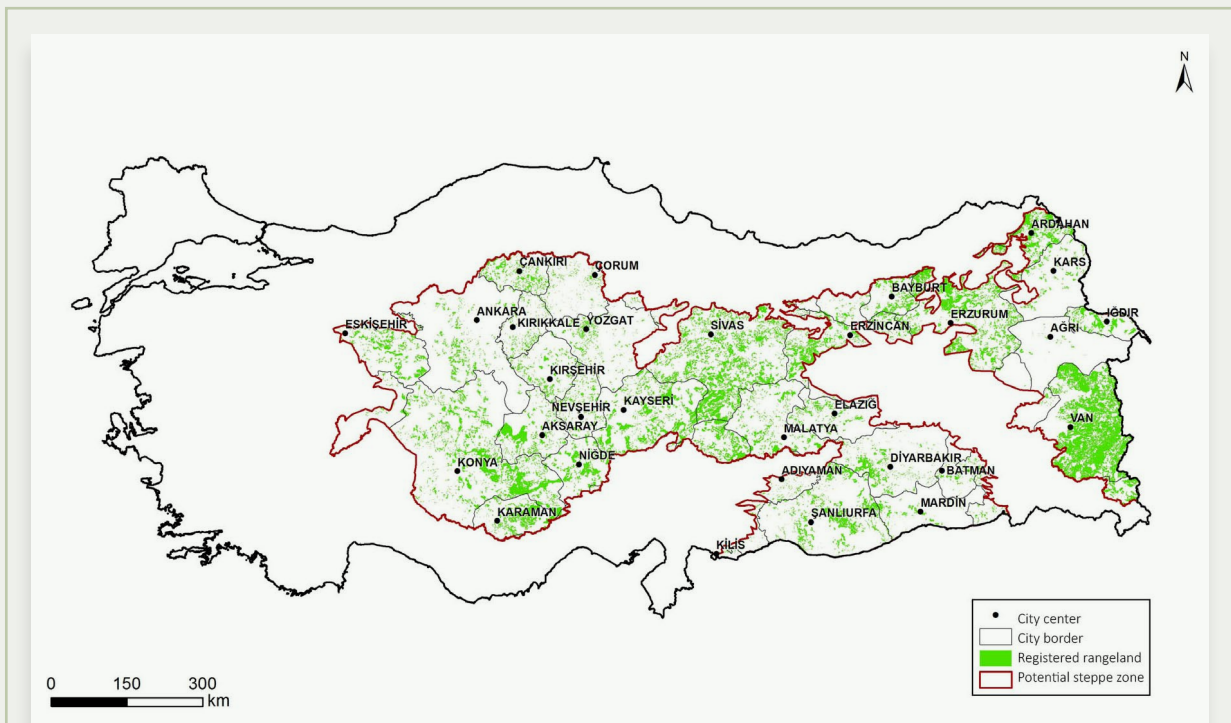
Figure 15. Distribution of the registered rangelands within the potential steppe zone in Turkey (Data Source: Ministry of Agriculture and Forestry General Directorate of Plant Production)

3.1.1. Protected Areas

Within the potential steppe zone, there are 119 protected areas with a legal status, 15 National Parks, including 6 Historical National Parks (HNP), 39 Wetlands with protection status, 2 Nature Reserves (NR), 19 Wildlife Reserves (WR), 10 Natural Monuments (NM), 32 Natural Parks (NP) and 3 Special Environmental Protection Areas (SEPA) (Table 8, Figure 16). The protected areas in the zone span a total area of 1,634,418 ha, corresponding to 29% of the total protected area and 20% of the number of protected areas in Turkey. In other words, 5% of the potential steppe zone is under protection with a legal status. Considering the representation of protected areas in the steppes, 4% of the 17.5 million ha of steppes and steppe forests (694,200 ha) are protected with a legal status.

Table 8. Numbers of the protected areas and the surface areas they cover

Protected area type	Potential steppe zone		Turkey		Ratio (%)	
	Number of protected areas	Area (ha)	Number of protected areas	Area (ha)	Number of protected areas	Area
National Park*	15	285,857	45	913,110	33	31
Wetlands	39	536,263	72	1,064,637	54	48
Nature Reserve	2	19,213	30	46,767	7	41
Wildlife Reserve	19	338,702	84	1,162,788	23	29
Natural Monument	10	-*	115	-	9	-
Natural Park	32	9,255	249	107,360	13	9
Special Environmental Protection Area	3	773,646	18	2,601,597	17	30
Total**	**120**	**1,634,418**	**613**	**5,720,304**	**20**	**29**

Natural Monuments are left blank due to absence of data about their size.

*** Overlapping values are not included in the total for areas with more than one protected area status when calculating the total area.*
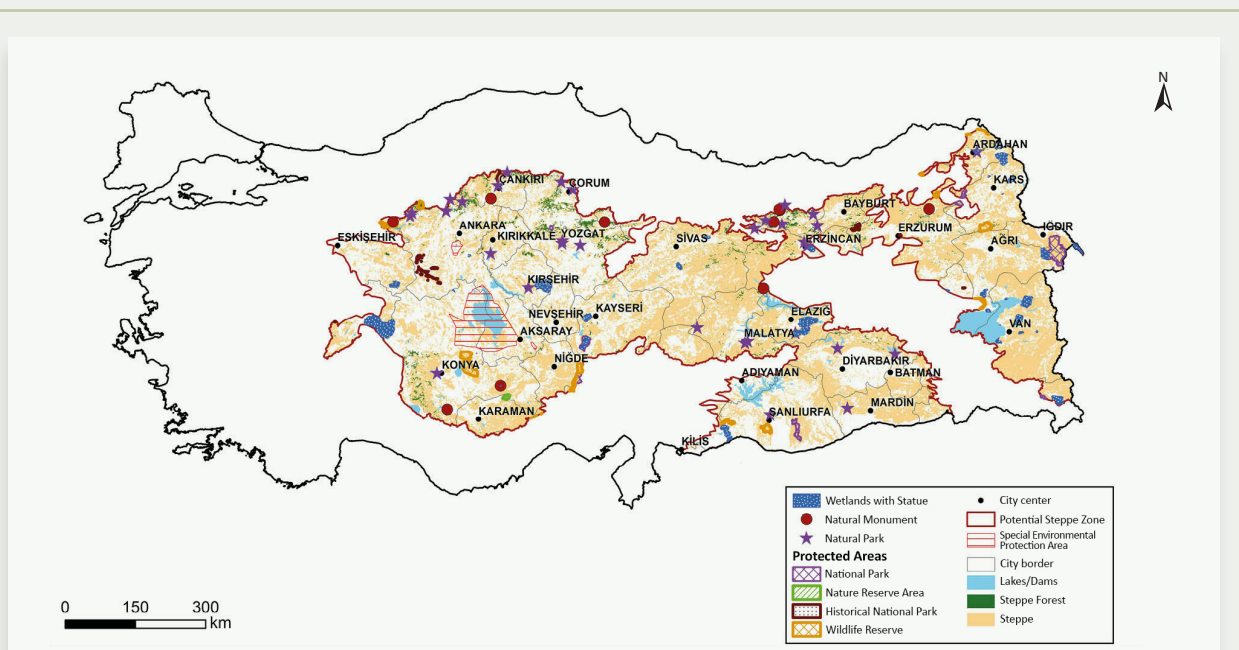
Figure 16. Protected areas with a legal status within the potential steppe zone in Turkey. (Data Source: MoAF General Directorate of Nature Conservation and National Parks and MoEU General Directorate of Protection of Natural Assets).

The protected areas within the potential steppe zone in Turkey host different types of ecosystems such as wetlands, lakes, forests, and steppes. A separate study was carried out to evaluate the representation of the steppe ecosystems in these protected areas. In this context, the density of the steppe vegetation in the protected areas within the potential steppe zone was addressed. When assessed by the geographical regions, the protected areas in the Central Anatolia stand out with their steppes of 295,936 ha (Table 9). Central Anatolia is followed by Eastern Anatolia and Southeastern Anatolia. As for the distribution of steppe vegetation in the protected areas, Ağrı Mountain NP, and Kars Sarıkamış Kağızman WR stand out in the Eastern Anatolia Region. In the Southeastern Anatolia Region, Tek Tek Mountains NP and Kızılkuyu WR, Karkamış Floodplain and Birecik WR, which are the habitats of the Arabian sand gazelles (Gazella marica), come as prominent protected areas in terms of steppes. In the Central Anatolia Region, Salt Lake SEPA, Konya-Bozdağ WR, an important area for Anatolian mouflon (Ovis gmelinii anatolica), Akşehir-Eber Wetland, Niğde Çamardı WR and Aladağlar NP stand out with their steppe area (Table 9).

Table 9. The area covered by steppe vegetation in the protected areas

No	Protected Area Name	Type	Geographical Regions*	Area (ha)**
1	Salt Lake	SEPA	Central Anatolia	200,188
2	Ağrı Mountain	NP	Eastern Anatolia	87,523
3	Konya Bozdağ	WR	Central Anatolia	52,290
4	Akşehir, Eber Lake	Wetland with status	Central Anatolia	22,129
5	Kars Sarıkamış Kağızman	WR	Eastern Anatolia	19,185
6	Tek Tek Mountains	NP	Southeastern Anatolia	18,738
7	South Keban	Wetland with status	Eastern Anatolia	18,060
8	Bendimahi Delta	Wetland with status	Eastern Anatolia	17,504
9	Niğde Çamardı Demirkazık	WR	Central Anatolia	16,840
10	Doğubeyazıt Marshes***	Wetland with status	Eastern Anatolia	15,610
11	Seyfe Lake***	Wetland with status, RAMSAR	Central Anatolia	15,038
12	Hazar Lake	Wetland with status	Eastern Anatolia	14,682
13	Kızılkuyu	WR	Southeastern Anatolia	14,328
14	Aladağlar	NP	Central Anatolia	13,555
15	Sarıkamış Allahuekber Mountains	NP	Eastern Anatolia	13,071
16	Emresultan	WR	Central Anatolia	11,658
17	Battle of Sakarya	HNP	Central Anatolia	10,840
18	Yüksekova Marshes	Wetland with status	Eastern Anatolia	10,414
19	Sultansazlığı	NP, RAMSAR and Nationally Important Wetland	Central Anatolia	9,769
20	Hürmetçi Marshes	Wetland with status	Central Anatolia	8,646
21	Balıkdamı***	Wetland with status	Central Anatolia	7,533
22	Aras Karasu Floodplain	Wetland with status	Eastern Anatolia	6,662
23	Erçek Lake	Wetland with status	Eastern Anatolia	5,899
24	Çıldır Lake	Wetland with status	Eastern Anatolia	5,734
25	Gölbaşı	SEPA	Central Anatolia	5,395
26	Kop Mountain Defence	HNP	Black Sea	5,044
27	Erzurum Oltu	WR	Eastern Anatolia	4,909

No	Protected Area Name	Type	Geographical Regions*	Area (ha)**
28	Sultansazlığı***	Wetland with status, RAMSAR	Central Anatolia	4,684
29	Bitlis - Adilcevaz Süphandağı	WR	Eastern Anatolia	4,36
30	Gümüşhane Şiran Kuluca	WR	Black Sea	4,182
31	Karkamış Floodplain***	Wetland with status	Southeastern Anatolia	4,180
32	Ekşisu Marshes	Wetland with status	Eastern Anatolia	3,990
33	Hakkari Cilo ve Sat Mountains	NP	Eastern Anatolia	3,794
34	Kuyucuk Lake	Wetland with status	Eastern Anatolia	3,171
35	Putka Lake	Wetland with status	Eastern Anatolia	2,921
36	Seyfe Lake	NRA	Central Anatolia	2,863
37	Adana Pozantı Karanfildağ	WR	Mediterranean	2,813
38	Akgöl (Ereğli Marshes)	NRA	Central Anatolia	2,768
39	Aktaş Lake	Wetland with status	Eastern Anatolia	2,439
40	Ulaş Lake	Wetland with status	Central Anatolia	2,434
41	Turna Lake	Wetland with status	Eastern Anatolia	2,380
42	Tödürge Lake	Wetland with status	Central Anatolia	1,818
43	Ardahan Posof	WR	Eastern Anatolia	1,469
44	Artvin Yusufeli Çoruh Valley	WR	Black Sea	1,445
45	Ihlara	SEPA	Central Anatolia	1,422
46	Botan Valley	NP	Southeastern Anatolia	1,106
47	Dönemeç Delta	Wetland with status	Eastern Anatolia	1,019
48	Arin Lake	Wetland with status	Eastern Anatolia	900
49	Tol Lake	Wetland with status	Central Anatolia	665
50	Boğazköy Alacahöyük	NP	Black Sea	600
51	Sarısu Plain	Wetland with status	Eastern Anatolia	563
52	Ankara Beypazarı Kapaklı	WR	Central Anatolia	512
53	Birecik	WR	Southeastern Anatolia	501
54	Çelebibağ Marshes	Wetland with status	Eastern Anatolia	480
55	Meke Maar	Wetland with status	Central Anatolia	444
56	Torum Lake	Wetland with status	Karadeniz Bölgesi	429
57	Bulanık Plain	Wetland with status	Eastern Anatolia	375
58	Çalı Lake	Wetland with status	Eastern Anatolia	330
59	Akgöl	Wetland with status	Eastern Anatolia	314
60	Nenehatun	NP	Eastern Anatolia	305
61	Aygır Lake	Wetland with status	Eastern Anatolia	286
62	Mersin Çamlıyayla Cehennem Stream	WR	Mediterranean	247
63	Malazgirt Battle	HNP	Eastern Anatolia	184
64	Eskişehir Sivrihisar Balıkdamı	WR	Central Anatolia	157
65	Kızören Pothole	Wetland with status	Central Anatolia	110
66	Başkomutan	HNP	Aegean	89
67	Karasu Delta	Wetland with status	Eastern Anatolia	74
68	İstiklal Road	HNP	Central Anatolia	56

No	Protected Area Name	Type	Geographical Regions*	Area (ha)**
69	Kayseri Yahyalı Aladağlar	WR	Central Anatolia	36
70	Ankara Nallıhan Davutoğlan	WR	Central Anatolia	19
71	Yozgat Pinetum	NP	Central Anatolia	12
72	Şanlıurfa Birecik Fırat	WR	Southeastern Anatolia	10

In case that a protected area intersects with more than one geographic region, the geographic region containing more steppe areas is chosen.

**Protected areas with a steppe area of less than 1 hectare are not given in the table.*

****Some or all of the specified wetlands are protected by another protection status. Balıkdamı: Eskişehir Sivrihisar Balıkdamı WR; East Beyazıt Marshes: Ağrı Mountain National Park; Karkamış Floodplain: Şanlıurfa Birecik Fırat WR; Kuyucuk Lake: Kars-Kuyucuk WR; Seyfe Lake: Seyfe Lake NRA; Sultansazlığı: Sultansazlığı NP.*

In the light of these data, it is seen that the steppes in Turkey are mostly protected by WR and NP statuses. As for NRAs, they have some representations on the edges of wetlands (Table 9). In addition, it is seen that steppe ecosystems are represented in wetlands with status and HNPs. Even if areas with WR status host steppe ecosystem, the protection status is generally given them due to elements of their fauna. For this reason, it is important to handle the steppe species and their habitats as a priority in making plans for the protected areas such as Konya Bozdağ WR and Niğde-Çamardı Demirkazık WR, which are especially important for steppes and contain large steppe areas, and to carry out monitoring studies for these species. In National Parks with steppe ecosystems, making inventories, planning and monitoring for steppe habitats and priority steppe species are important for effective conservation of the steppes. Although protected areas may contain large steppes, representation of steppes in protected areas with a legal status is limited in some provinces. It is important to declare new protected areas for steppes, especially in Sivas, Van and Kayseri, which contain large steppe areas.

3.1.2. Important Biodiversity Areas

There are studies of different institutions that indicate important areas in terms of biodiversity. One of these is a set of studies of Systematic Conservation Planning (SCP). These studies were conducted by Doğa Koruma Merkezi for the Black Sea Region (Turak et al., 2011), Anatolia Diagonal (Ambarlı et al., Unpublished report), and the Lower Caucasus Region (Zeydanlı et al., Unpublished report) and by Doğal Hayatı Koruma Derneği (DHKD; Society for the Protection of Nature) for the Southeastern Anatolia Region (Welch, 2004). In addition, candidate Natura 2000 sites were determined with the use of Systematic Conservation Planning (SCP) within the scope of the project entitled "Technical Assistance for Strengthening the National Nature Conservation System for the Implementation of Natura 2000 Requirements" implemented in the Central Anatolian Region by the General Directorate of Nature Conservation and National Parks of the Ministry of Agriculture and Forestry (Tarım ve Orman Bakanlığı, 2018c).

According to the studies that use the Systematic Conservation Planning approach, in which the biodiversity elements and the threats in the region are assessed together, there are 62 "Priority Conservation Areas", all or part (as a threshold, at least 10% of its surface area has been used) of which are located in the potential steppe zone, and the steppe ecosystems are represented in almost all of these areas. The Priority Conservation Areas in the potential steppe zone cover an area of 1,990,326 ha. In addition, 29 candidate Natura 2000 sites were identified within the boundaries of the potential steppe zone. These areas span 1,526,839 ha. In Figure 17, Priority Conservation Areas and candidate Natura 2000 sites defined as a result of these studies are given. Table 10 presents the size of the steppes in these sites. The areas that stand out in terms of steppes are Mardin Mountains, Karapınar - Ereğli Plains, West Karacadağ and West Ceylanpınar Priority Conservation Areas.
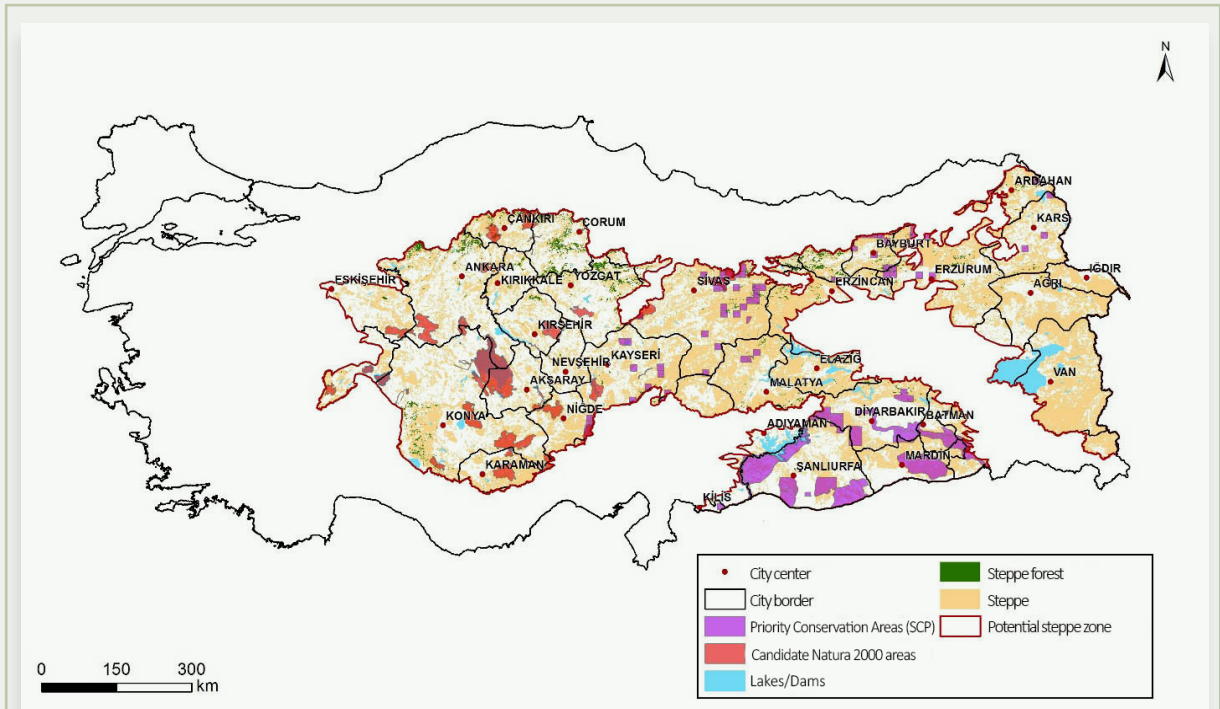
Figure 17. Priority Conservation Areas (1,990,326 ha) and candidate Natura 2000 sites (1,526,839 ha) determined as a result of Systematic Conservation Planning studies in the potential steppe zone in Turkey. (Data Source: SCP Priority Conservation Areas data of Doğa Koruma Merkezi and Candidate NATURA 2000 data of the MoAF General Directorate of Nature Conservation and National Parks).

Table 10. The size of the steppes in the Priority Conservation Areas and candidate Natura 2000 areas

No	Name*	Province	Steppe area (ha)
1	Mardin Mountains - Biosphere Reserve	Mardin	167,984
2	Karapınar-Ereğli Plains	Konya, Ereğli	97,914
3	West Karacadağ	Diyarbakır - Şanlıurfa	80,814
4	West Ceylanpınar	Şanlıurfa	72,467
5	Hasankeyf	Batman – Mardin - Siirt	68,974
6	East Karacadağ	Diyarbakır - Şanlıurfa	58,042
7	Bozdağlar	Konya	56,618
8	Hasan Dağı - Melendiz Mountains	Niğde, Aksaray	53,082
9	Ayrancı Steppes	Karaman	50,908
10	Urfa Steppe	Şanlıurfa	41,711
11	Hafik-Zara Gypsum Hills	Sivas	35,851
12	Aladağlar	Niğde - Adana	34,187
13	Güçlükonak / Taşkonak	Şırnak – Mardin - Siirt	33,203
14	Sivas Gypsum Karsts	Sivas	32,012
15	Upper Sakarya River	Eskişehir, Ankara, Konya	29,049
16	Ilgaz Mountain	Çankırı, Çorum, Kastamonu	27,387
17	Kop Mountain	Erzurum - Bayburt	26,689
18	Hazro	Diyarbakır	25,739

No	Name*	Province	Steppe area (ha)
19	Divriği-İmranli Forests	Sivas	25,015
20	Sultansazlığı	Kayseri	23,991
21	Eldivan Hills	Çankırı	23,534
22	Hekimhan	Malatya	23,157
23	Aladağlar	Niğde, Adana, Kayseri	22,025
24	Dedekaya Hills	Ankara	20,886
25	Kösedağ	Sivas	19,365
26	Tatlısu Basin	Sivas	18,464
27	Kumalar Mountain	Afyonkarahisar	16,814
28	Çöl Lake	Ankara, Konya	15,853
29	South of Gürlevik Mountain	Sivas	15,726
30	South of İmranlı	Sivas	15,705
31	Akören-Çumra Steppes	Konya	15,417
32	Pınarbaşı	Kayseri	14,713
33	North İspir	Erzurum	11,164
34	Palas Lake	Kayseri	9,983
35	Aslantaş	Kayseri - Adana	9,326
36	Hezanlı Mountain	Sivas - Kahramanmaraş	8,870
37	Sakar Mountain Oak Forests	Sivas	8,052
38	Bayburt	Bayburt	7,848
39	Karaseki Plain	Sivas	7,750
40	Tohma Watercourse Valley	Sivas	7,322
41	Digor	Kars	6,400
42	İspir Devedağı	Erzurum	6,341
43	Karababa Mountain	Sivas	6,041
44	Elbaşı	Kayseri	5,112
45	Vavuk Mountain Pass	Bayburt - Gümüşhane	4,937
46	Kolçekmez Mountain	Gümüşhane	3,802
47	East of Sakaltutan Pass	Gümüşhane - Erzincan	1,394

Priority Conservation Areas and candidate Natura 2000 sites, which have steppes in more than 50% of their surface area, are shown in the table. Candidate Natura 2000 sites are shown in gray.

An important study on steppe ecosystems and steppe species is the Important Plant Areas (IPA) study conducted by WWF-Turkey (Özhatay et al., 2003; Özhatay, 2006). All or part (at least 10% of its surface area) of the 53 IPAs determined by considering the distribution of rare and endangered plant species are within the boundaries of the potential steppe zone (Figure 18). In Table 11, size of the steppes in these areas is given. Iğdır Plain, Tendürek Mountain and Karacadağ stand out in terms of steppe areas.
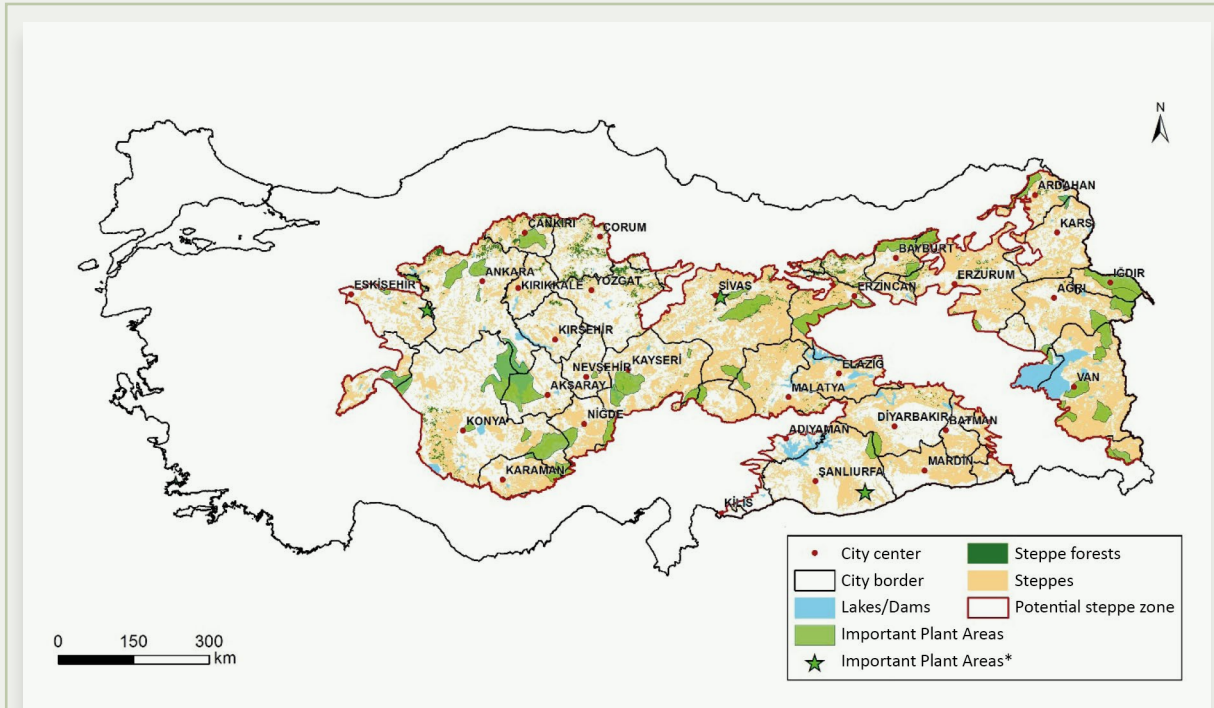
Figure 18. Important Plant Areas (>2,800,000 ha) within the potential steppe zone in Turkey. Certain IPAs (indicated by * on the map) could not be shown on the map since their boundaries are not set. (Data Source: IPA data provided in Özhatay et al., 2003 and Özhatay, N. 2006).

Table 11. The size of the steppes in the Important Plant Areas

No	Name*	Province	Steppe area (ha)
1	Iğdır Plain	Iğdır	85,466
2	Tendürek Mountain	Ağrı, Van	81,132
3	Karacadağ	Diyarbakır, Şanlıurfa	68,921
4	Erciyes Mountain	Kayseri	67,210
5	Binboğa Mountains	Kahramanmaraş, Kayseri	57,207
6	Erek Mountain	Van	48,385
7	Tohma Valley (Gürün-Darende)	Malatya, Sivas	46,687
8	Kop Mountain	Bayburt, Erzurum	31,255
9	Pirreşit Mountain	Van	27,832
10	Karapınar Plain	Konya	14,298
11	Akyay Lake	Konya	10,237
12	Poske	Erzincan, Gümüşhane	1,912
13	Nallıhan Bird Paradise	Ankara	895
14	Topçuyeniköy	Sivas	425

*The IPAs with more than 50% of their area consisting of steppes.

Karacadağ Steppes

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Another study on the important biodiversity areas is the Key Biodiversity Areas defined by Doğa Derneği (BirdLife in Turkey) (KBA; Eken et al., 2006). All or part (at least 10% of its surface area) of 122 areas, in which rare and endangered species belonging to many different living groups are identified, overlap with the potential steppe zone (Figure 19). 81 of these areas are also Important Bird Areas (IBA). KBAs within the potential steppe zone cover an area of 7,001,922 ha. Areas that stand out with their special steppe ecosystems are Şanlıurfa Akçakale Steppes KBA, Bozova KBA, South Euphrates Valley and Birecik Steppes KBA covering the Şanlıurfa-Adıyaman-Gaziantep region, and Olur-Oltu Steppes KBA in Erzurum and Acıkır Steppes KBA. In addition, the Mardin Mountains KBA, Ceylanpınar KBA, and Van Eastern Mountains KBA, with more than 50% of their area consisting of steppes, stand out in terms of the steppe ecosystems (Table 12).
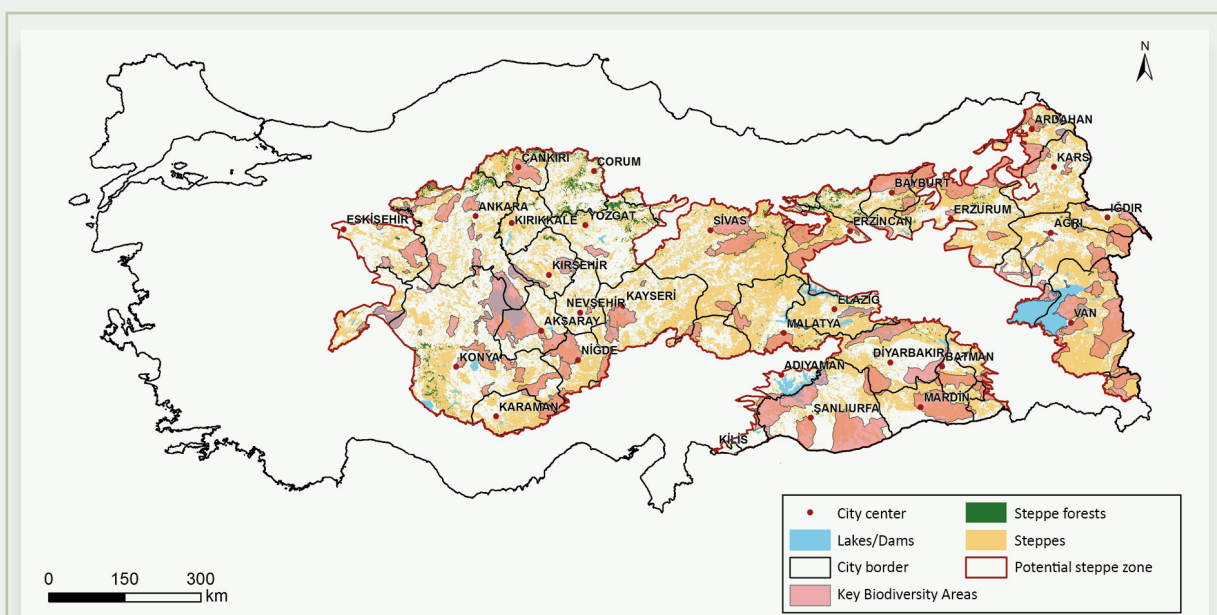
Figure 19. The Key Biodiversity Areas (7,001,922 ha) within the potential steppe zone in Turkey. (Data Source: KBA data produced by Eken et al., 2006).

Table 12. The size of the steppes in the Key Biodiversity Areas

No	Name*	Province	Steppe area (ha)
1	Mardin Mountains	Mardin - Şırnak	239,287
2	Ceylanpınar	Şanlıurfa	201,284
3	Van Eastern Mountains	Van	163,332
4	Hasan Mountain	Aksaray - Niğde	141,610
5	Karacadağ	Diyarbakır - Şanlıurfa - Mardin	125,107
6	Tecer Mountains	Sivas	123,071
7	Dicle Valley	Batman - Mardin - Siirt - Şırnak - Diyarbakır	117,865
8	Southeast Taurus Threshold	Diyarbakır - Elazığ - Bingöl	115,428
9	Ağrı Mountain	Ağrı - Iğdır	106,748
10	Tortum Basin	Erzurum - Artvin	102,486
11	Ereğli Plain	Konya - Niğde - Karaman	98,347
12	Mordağlar	Hakkari - Van	94,187
13	Tendürek Mountain	Van - Ağrı	77,272
14	Kubbe Mountain	Malatya - Adıyaman	71,169
15	Hodulbaba Mountain	Konya	70,422
16	Akçakale Steppes	Şanlıurfa	70,061
17	Çankırı Gypsum Hills	Çankırı - Ankara	66,270
18	Erciyes Mountain	Kayseri	64,346
19	Tohma Valley	Malatya - Sivas	61,963
20	Acıkır Steppes	Eskişehir	60,091
21	İspiriz Mountain	Van	58,897
22	Van Plain	Van	57,104
23	Binboğa Mountains	Kahramanmaraş - Kayseri	47,332
24	Erek Mountain and Turna Lake	Van	44,551
25	Kop Mountain	Bayburt - Erzurum	30,525
26	Pirreşit Mountain	Van	30,264
27	Çaldıran Plain	Van	25,963
28	Karapınar Plain	Konya	24,359
29	Sultansazlığı	Kayseri	23,193
30	Karasu Plain	Erzurum	19,792
31	Sarıyar Dam	Eskişehir - Ankara	19,447
32	Kirmir Valley	Ankara	19,168
33	Obruk Plateau	Konya	18,130
34	Ardahan Forest	Ardahan	17,698
35	Kars Plain	Kars	15,076
36	Akyay Plain	Konya	9,278
37	Hotamış Reeds	Konya - Karaman	9,189
38	Hürmetçi Reeds	Kayseri	4,811
39	Göreme Hills	Nevşehir	3,557
40	Beynam Forests	Ankara	2,938
41	Çiçekli Lakes	Van	1,771
42	Ekşisu Reeds	Erzincan	1,613
43	Akkaya Pond	Niğde	406

The KBAs with more than 50% of their area consisting of steppes.

In this context, another study carried out on a national scale is the Prime Butterfly Areas (PBAs) defined by Doğa Koruma Merkezi. PBAs are the areas determined by taking into consideration the areas that are rich in butterfly diversity, especially in rare, endemic and endangered species (Karaçetin et al., 2011). All or part (at least 10% of its surface area) of 37 of 65 PBAs defined on national scale are located within the potential steppe zone and overlap with steppes (Figure 20). The size of steppes in the PBAs is given in Table 13.
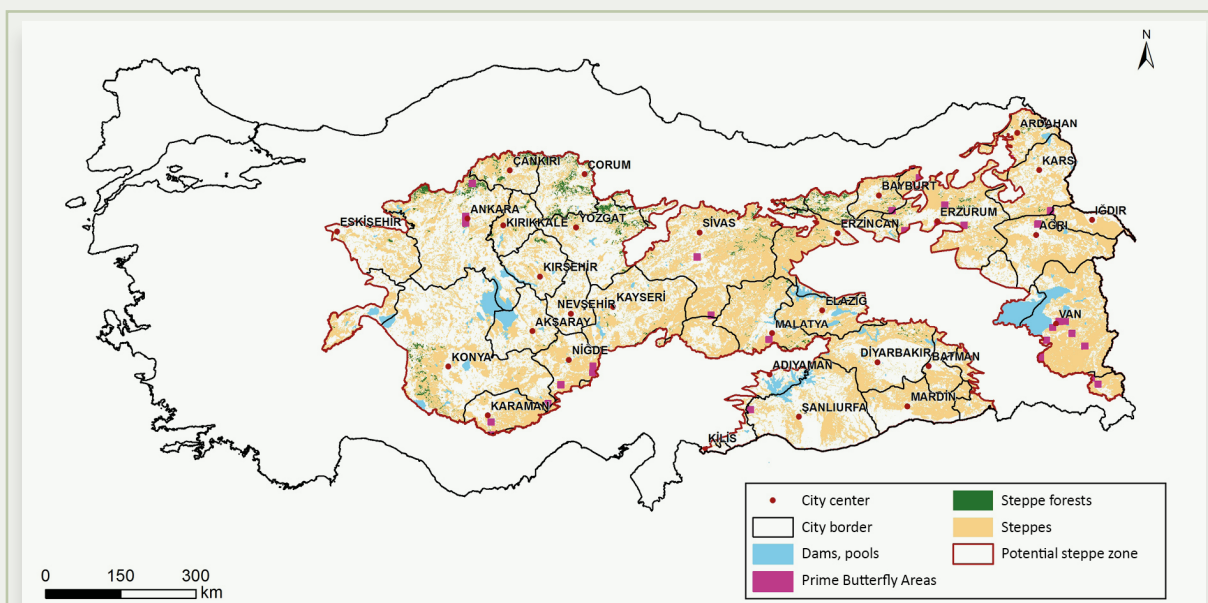
Figure 20. The Prime Butterfly Areas in the potential steppe zone in Turkey. (Data Source: Data from Prime Butterfly Areas Study coordinated by Doğa Koruma Merkezi, Karaçetin et al., 2011).

Table 13. The size of the steppes in the Prime Butterfly Areas

No	PBA Name*	Province	Steppe area (ha)
1	Erek Mountain	Van	17,833
2	Aladağlar	Niğde	16,770
3	Çatak Valley	Van	11,964
4	Güzeldere Pass	Van	9,864
5	Bolkar Mountains	Konya - Mersin	9,472
6	Duranlar	Kars - Iğdır	9,139
7	Gökpınar	Sivas - Kahramanmaraş	8,870
8	Taşlıyurt	Erzurum	8,513
9	Yüksekova	Hakkari	8,473
10	Güzelsu	Van	8,178
11	Yeşilyurt	Malatya	8,061
12	Artos Mountain	Van	7,771
13	Çaykavak Pass	Niğde	6,971
14	Dumlu	Erzurum	6,899
15	South of Karaman	Karaman	6,899
16	Kop Mountain	Bayburt - Erzurum	6,296
17	İspir	Erzurum	5,737
18	North of Ağrı	Ağrı	5,548
19	South of Aşkale	Erzurum	5,140
20	Sertavul Pass	Karaman - Mersin	4,980

*The PBAs with more than 50% of their area consisting of steppes.

3.1.3. Large Plains

Even though it is rather different from the above-mentioned protection statuses, another protection status, mainly about land use, is Agricultural Protected Area (Large Plains) status. The Great Plains Protected Areas are published in the Official Gazette with the approval of the Presidency in accordance with the 14th article of the Soil Preservation and Land Use Law No. 5403. As of July 2021, a total of 315 Great Plains Conservation Areas have been published and 61 Great Plains Conservation Areas have been submitted to the Presidency. In total, 376 Great Plain Conservation areas and an area of 8,987,263.51 hectares will be declared. Inventory studies within the large plains are still in progress. Within the scope of this project, spatially obtained data dated April 2020 were used. According to the spatial data obtained in April 2020, these plains cover an area of approximately 7,299,162 ha and correspond to 22% of the potential steppe zone. Also, 11% (801,085 ha) of the total area of the large plains in this region overlaps with steppes. In particular, Konya and Şanlıurfa are the provinces where the Great Plains Protected Areas span large areas (Figure 21).
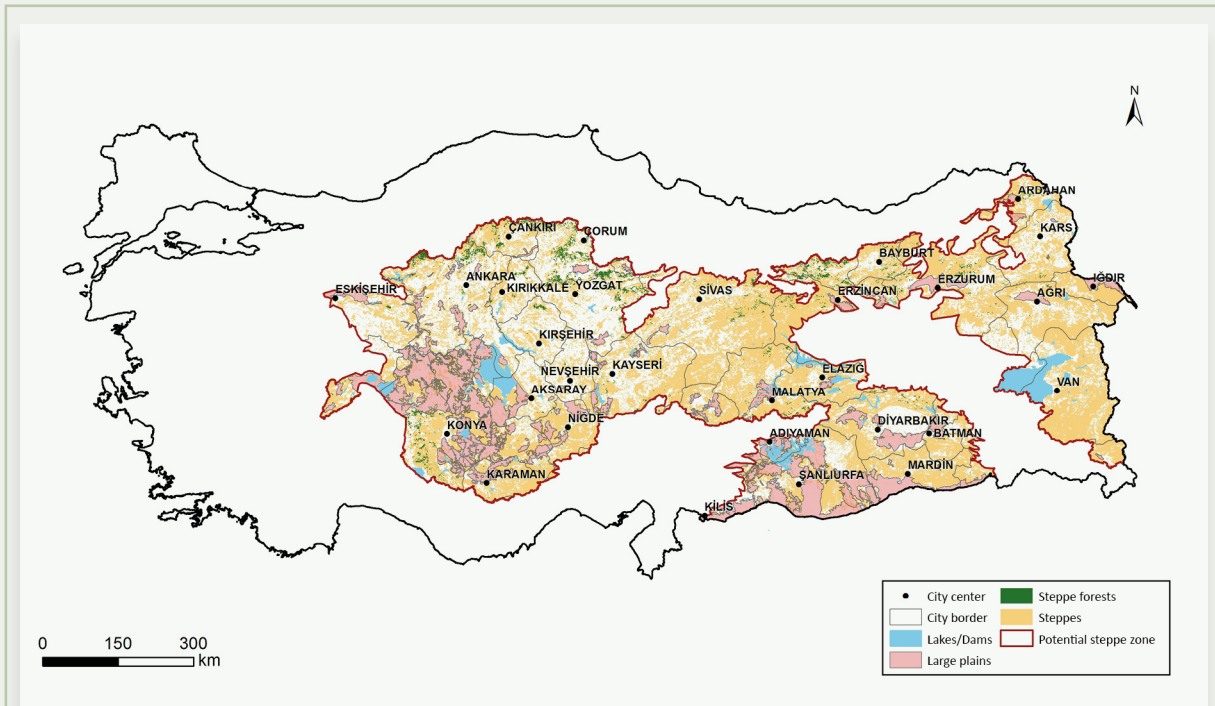
Figure 21. The Large Plains within the potential steppe zone in Turkey (7,299,162 ha). (Data Source: The Great Plain spatial data provided by MoAF General Directorate of Plant Production).

There are overlaps between the areas declared as Large Plains and the protected areas (Figure 22). On the other hand, Sultansazlığı NP and Konya Bozdağ WR are situated between Large Plains. There are also overlaps between the Kızılkuyu WR boundaries and the areas declared as Large Plains. In addition, the Kızören Pothole and the Kuyucuk Lake Wetlands and areas declared as Large Plains overlap to a high extent. Karkamış Floodplain, South Keman, Tol Lake, Akşehir-Eber Lakes and Ekşisu Marshes Wetlands also have parts that overlap with Large Plains. The steppes may be threatened by the need for new construction work in the stages of processing, storage and marketing of increased plant production with the introduction of irrigation in these plains. In addition, the natural habitats and other elements of biodiversity are expected to decrease as intensive agricultural practices increase in these areas. Therefore, it is important to take precautions for the steppes in and near the Large Plains.
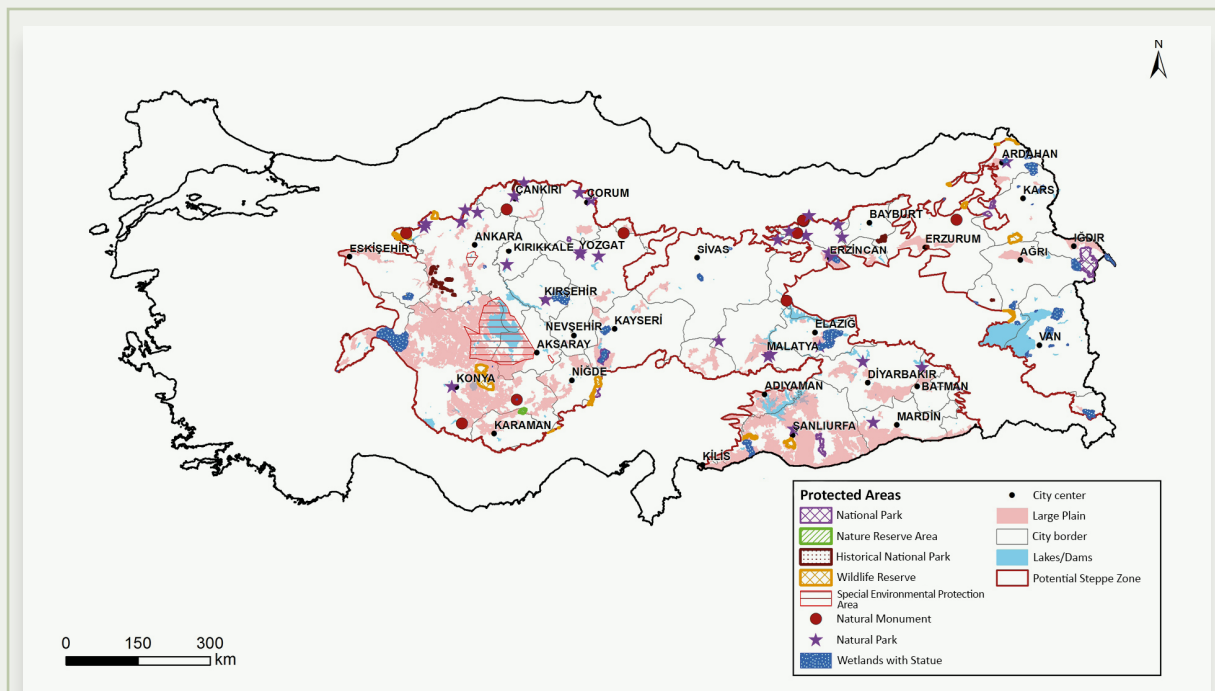
Figure 22. The Large Plains and potential protected areas within the potential steppe zone in Turkey. (Data Source: Data by MoAF General Directorate of Plant Production and General Directorate of National Parks).

3.1.4. Lands Owned by the General Directorate of Agricultural Enterprises (GDAE)

Despite not having a protected area status, the General Directorate of Agricultural Enterprises (GDAE) Lands in Turkey have been the areas that provide a level of protection to the steppes and the species that they host, within the scope of their operations and practices. Within the potential steppe zone in Turkey, there are 16 GDAE lands that can function in this way (Table 14, Figure 23). These areas are densely settled especially in the Central Anatolia Region. In these areas, maintaining dry farming practices and controlled and balanced use of agricultural chemicals are important for the survival of steppe creatures.

Table 14. The management types and sizes of GDAE lands within the potential steppe zone and the provinces in which they are located

GDAE name	Administration	Total Land (ha)	Province
Altındere Directorate of Agricultural Enterprises	Private-Leaseholder	1,987	Van
Altınova Directorate of Agricultural Enterprises	GDAE	31,137	Konya
Anadolu Directorate of Agricultural Enterprises	only 12.4% GDAE	4,482	Eskişehir
Bala Directorate of Agricultural Enterprises	Private-Leaseholder	8,384	Ankara
Ceylanpınar Directorate of Agricultural Enterprises	GDAE	163,325	Şanlıurfa
Çiçekdağı Directorate of Agricultural Enterprises	Private-Leaseholder	1,638	Kırşehir
Göle Directorate of Agricultural Enterprises	Private-Leaseholder	1,437	Ardahan
Gözlü Directorate of Agricultural Enterprises	GDAE	28,830	Konya
Hafik Directorate of Agricultural Enterprises	Private-Leaseholder	252	Sivas
Kazımkarabekir Directorate of Agricultural Enterprises	GDAE	18,787	Iğdır
Koçaş Directorate of Agricultural Enterprises	GDAE	2,549	Aksaray
Konuklar Directorate of Agricultural Enterprises	GDAE	4,457	Konya
Malya Directorate of Agricultural Enterprises	GDAE	20,919	Kırşehir
Polatlı Directorate of Agricultural Enterprises	GDAE	21,587	Ankara
Sultansuyu Directorate of Agricultural Enterprises	GDAE	2,706	Malatya
Ulaş Directorate of Agricultural Enterprises	GDAE	7,146	Sivas
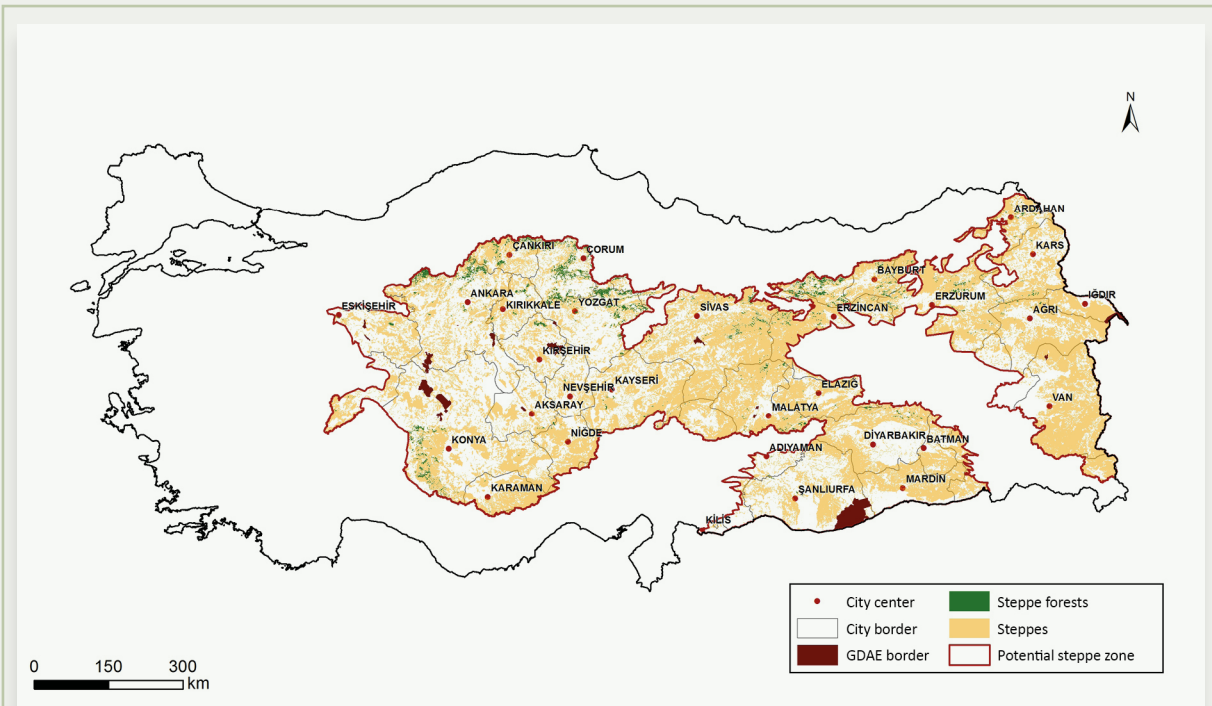
Figure 23. The GDAE lands within the potential steppe zone in Turkey (319,641 ha). (Data Source: TİGEM areas spatial data provided by TOB General Directorate of Agricultural Enterprises).

3.2.   Threats to the Steppes

Steppes, which represent the natural vegetation of steppe ecosystems in Turkey and are vital in terms of biodiversity, are threatened by various factors. Conversion of steppes into agricultural fields with increased mechanization in agricultural practices, intensive agriculture and animal husbandry practices (overgrazing) and drought as a result of climate change are the main threats to steppes. Increased settlement pressure, irrigation projects, energy investments, mining activities also cause irreversible loss of steppe areas.

Illegal hunting and species trafficking, excessive collection of plants and some animal species and intensive agricultural practices in the region also threaten steppe ecosystems and the species that they host. Today, steppes continue their existence in stony or rocky areas as islets that contain remains of natural vegetation between agricultural fields and grazing areas. The lack of awareness about the importance of steppe species in the region and the fact that the conservation efforts for these species are limited to the protected areas are the other factors that negatively affect the biodiversity of steppes. At the same time, these ecosystems, which are already threatened, are expected to become more vulnerable in the future, with the risks of drought and erosion predicted to go up with the changing climate.

3.2.1.   Grazing Pressure

Animal husbandry stands out as one of the main sources of income in the regions where steppe vegetation is dominant, especially in the Eastern Anatolia. It is very important that this activity, which is economically important, is sustainable in the long term, grazing is done in a planned manner in order not to damage the natural vegetation of the region, and some traditional practices are sustained. In order to assess the pressure from the current grazing activities on the steppes, numbers of ovine and bovine animals were obtained from TÜİK on a district basis and converted into spatial data, and their relationship with the steppes was assessed spatially. Predominant animal species used in animal husbandry varies spatially. Within the potential steppe zone in Turkey, bovine breeding is common in Northeast Anatolia (cattle), whereas ovine breeding (mostly sheep) is common in other regions. As for Kahramanmaraş, Mardin and Adıyaman, goat breeding stands out in those provinces (Figure 24, Figure 25, Figure 26, Table 7). The spatial distribution of district-based numbers of livestock is given in Figure 27, and the related table is in Annex 3.

According to the assessment made by using TÜİK data, among the provinces hosting some degree of steppes, those with the highest number of livestock are Konya, Ankara, Van, Ağrı, Şanlıurfa and Diyarbakır (Figure 24, Figure 25, Figure 26, Table 7). Implementing and supporting good practices for holistic grazing management with a view to performing sustainable and regenerative rangeland management in these areas with intensive animal husbandry is very important for the conservation of steppes.
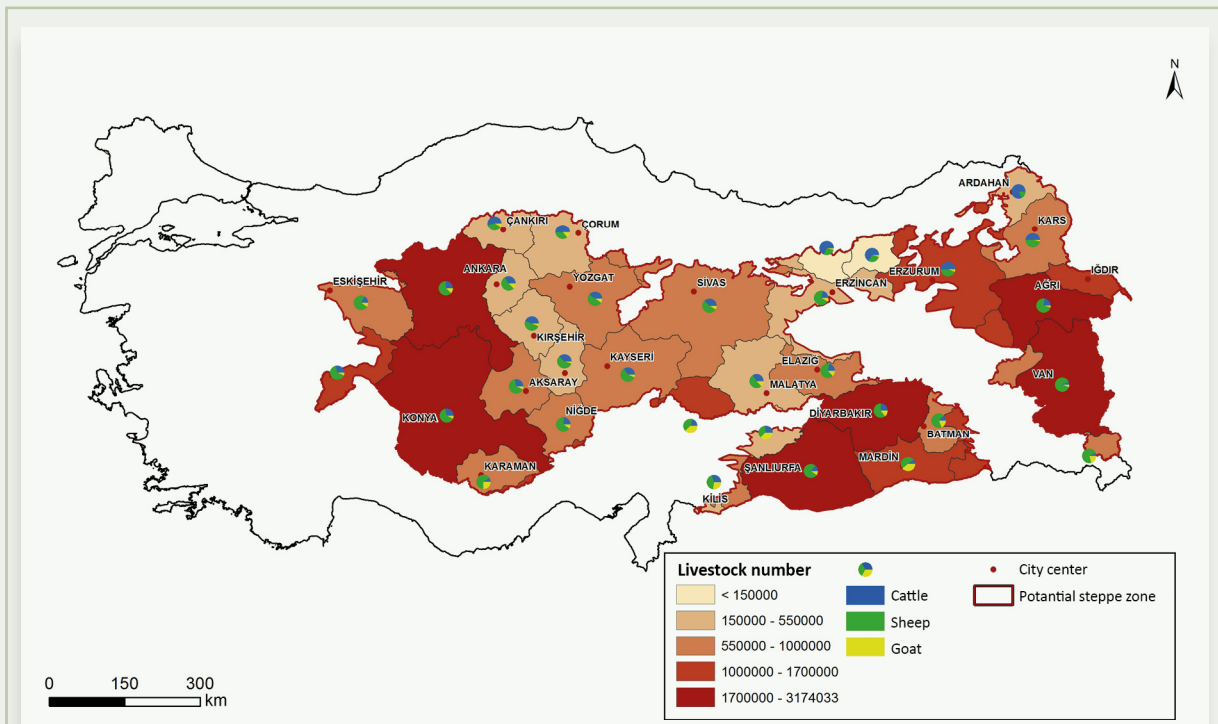
Figure 24. The number of livestock by provinces and distribution by species within the potential steppe zone in Turkey. (Data Source: TÜİK Livestock Statistics data).
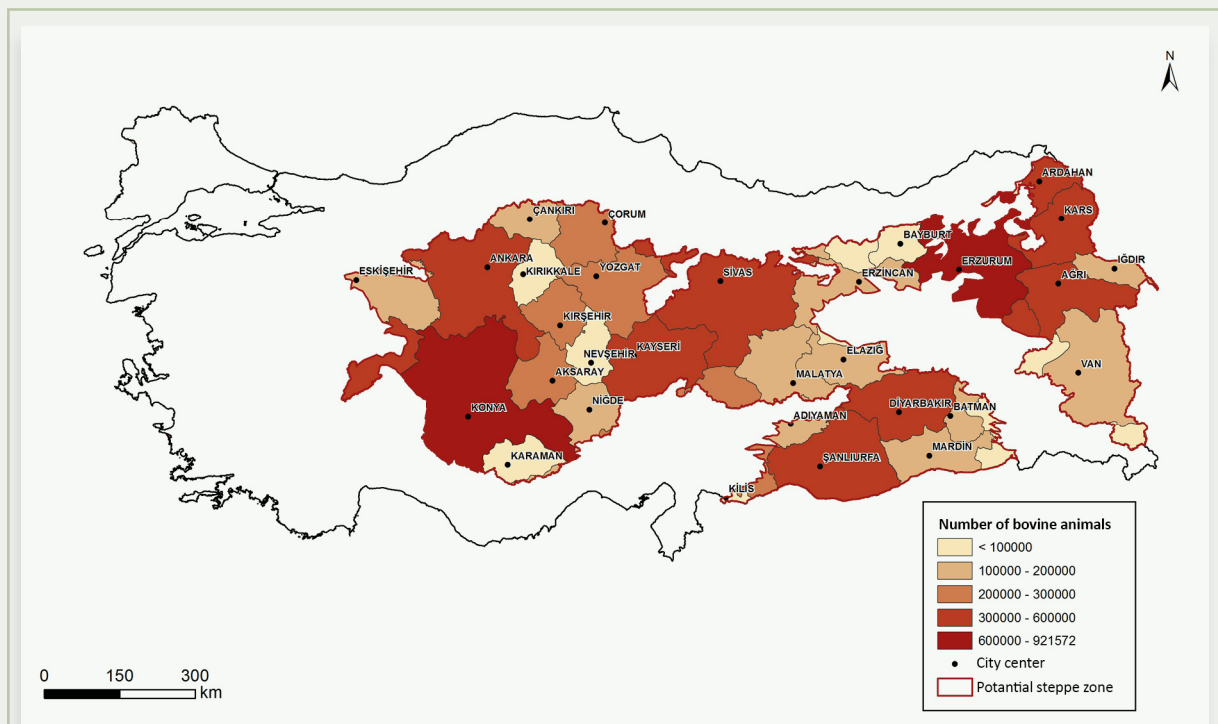
Figure 25. The number of bovine animals by provinces within the potential steppe zone in Turkey. (Data Source: TÜİK Livestock Statistics data).
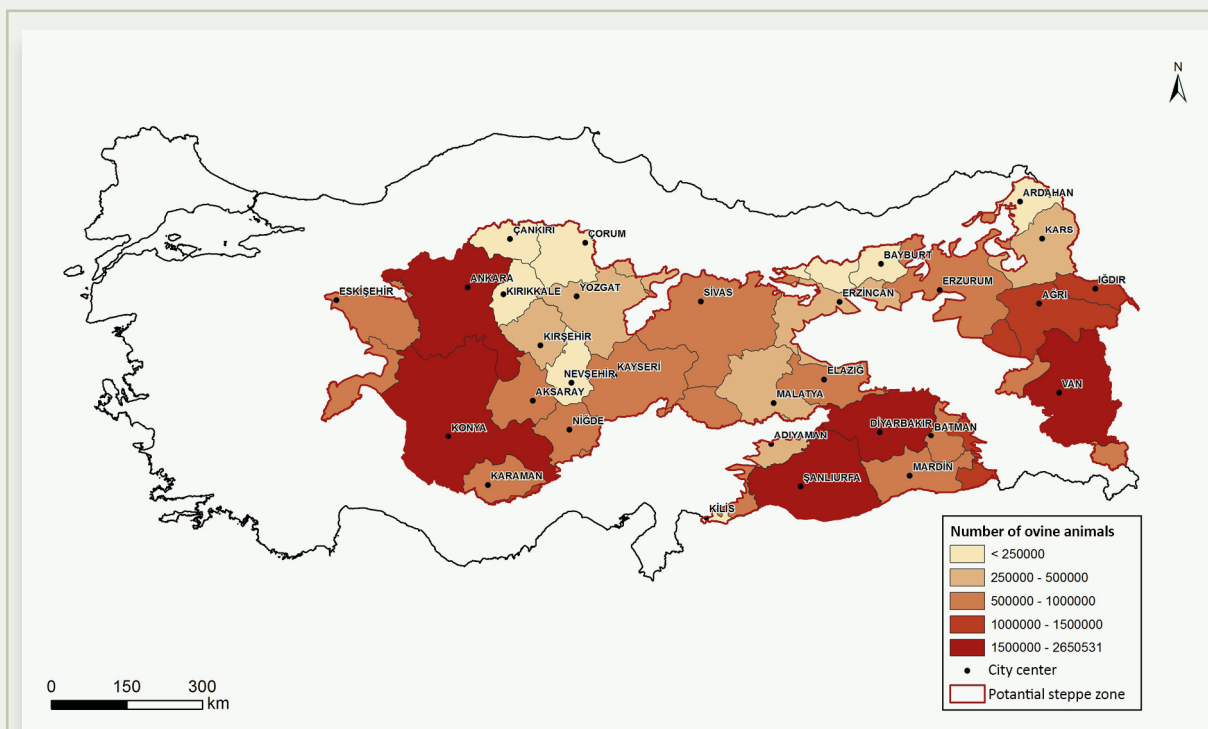
Figure 26. The number of ovine animals by provinces within the potential steppe zone in Turkey. (Data Source: TÜİK Livestock Statistics data).
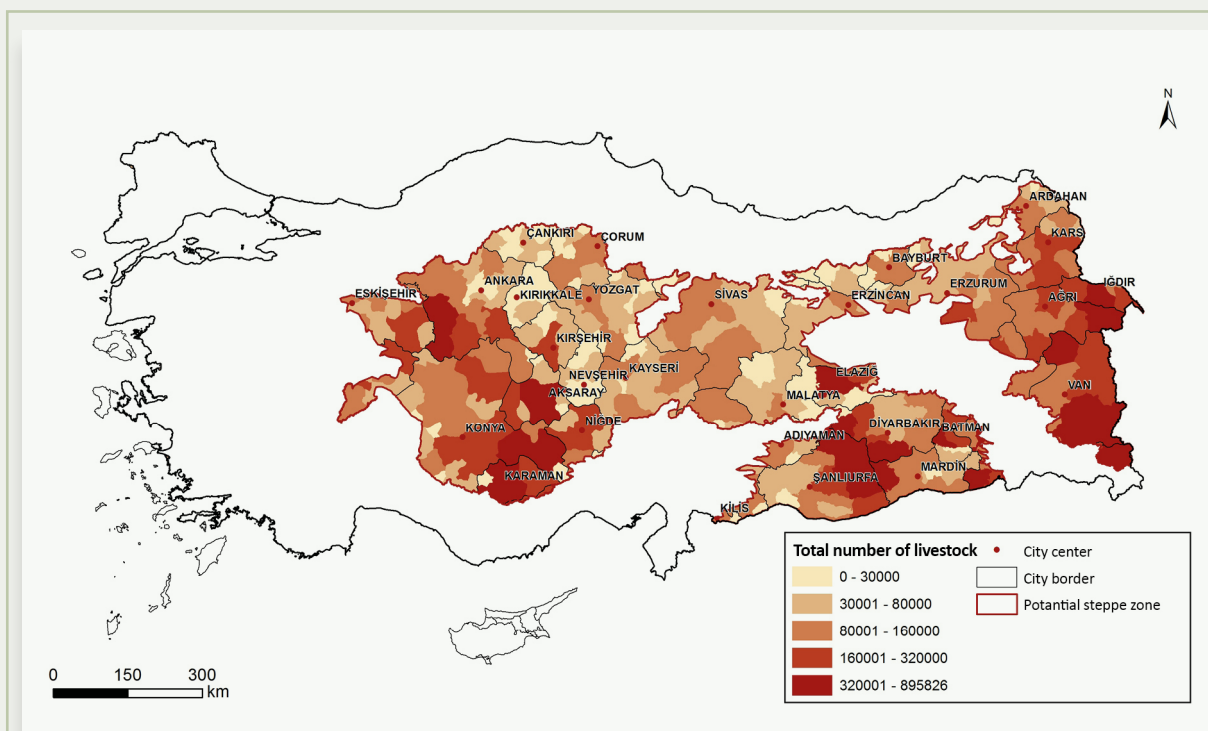
Figure 27. The number of livestock by districts within the potential steppe zone in Turkey. (Data Source: TÜİK Livestock Statistics data).

Another assessment regarding the grazing pressure was made on the size of the rangelands and numbers of livestock in the provinces within the potential steppe zone (Table 7). Since the grazing pressure of each animal species/age group on a rangeland will be different, Article 6 of the Section 2 of the Pasture Regulation numbered 23419 was taken as the basis for the animal units[6]. For TÜİK 2019 animal data, each animal group was multiplied by the corresponding animal units given in Table 15, and all animal species were included in the calculations as bovine units. Afterwards, grazing pressure across the province was evaluated by calculating the unit of rangeland area (ha) per animal number for each province (Figure 28). In this evaluation, since there is no data on how many of the bovine and ovine animals graze on the rangelands and how many of them are in closed systems and in the corrals, it is assumed that all animals in the province use the rangelands.

Table 15. The numbers of animal species mentioned in the Pasture Regulation in terms of bovine units[6]

Type of animal	Bovine Unit	Type of animal	Bovine Unit
Cultured breed dairy cow	1	Buffalo (male)	0.90
Cultured hybrid	0.75	Buffalo (female)	0.75
Domestic cow	0.50	Ox	0.60
Veal-heifer (culture breed)	0.60	Lamb-goat	0.04
Veal-heifer (culture hybrid)	0.45	Bull	1.50
Veal-heifer (domestic)	0.30	Horse	0.50
Sheep	0.10	Mule	0.40
Goat	0.08	Donkey	0.30
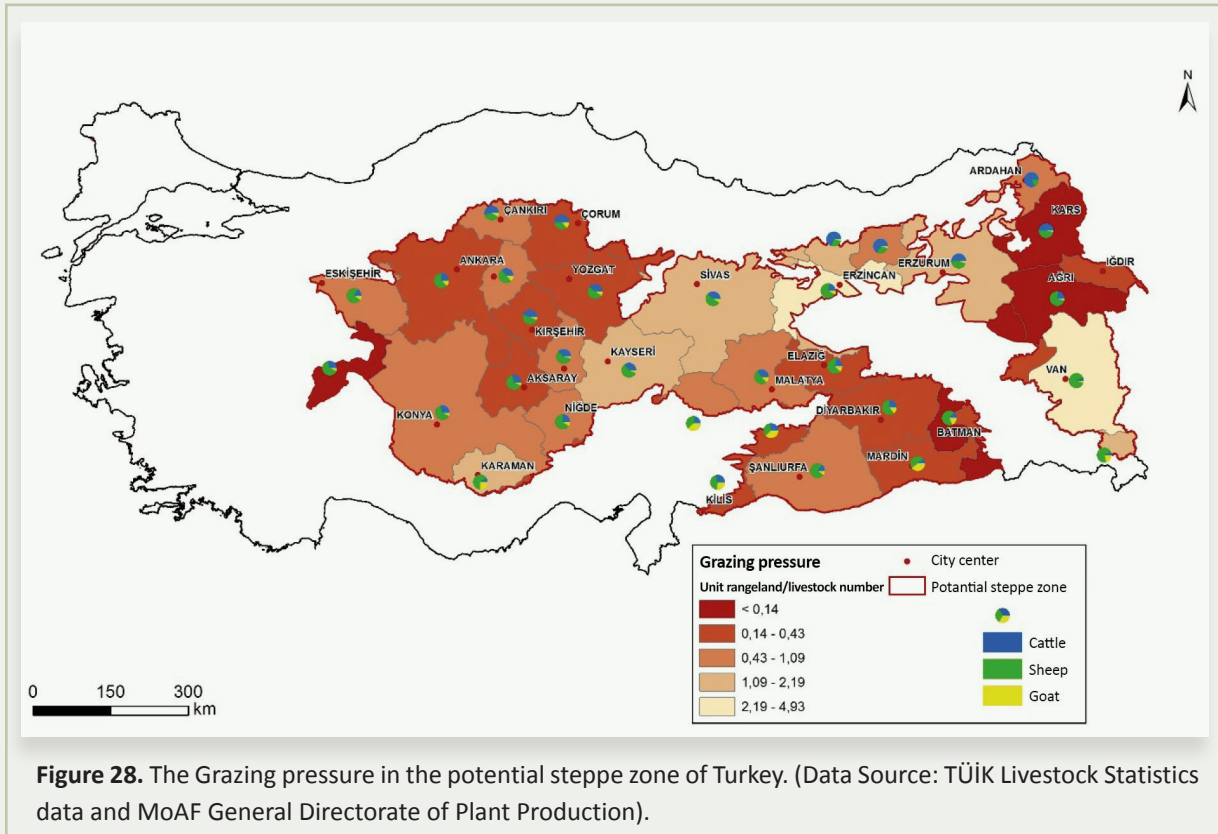
Figure 28. The Grazing pressure in the potential steppe zone of Turkey. (Data Source: TÜİK Livestock Statistics data and MoAF General Directorate of Plant Production).

6. https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=5057&MevzuatTur=7&MevzuatTertip=5

From these assessments, it is seen that among the provinces overlapping with the potential steppe zone with more than 50% of their territories, the rangeland area per animal unit is the lowest in Ağrı, Kars, and Batman provinces (0.04 ha, 0.12 ha, 0.14 ha, respectively) (Table 16). It is safe to state that the intensity of rangeland use in these provinces is higher than in others. Van, Erzincan, and Sivas provinces stand out with the highest amount of rangeland per unit of animal (3.36 ha, 2.93 ha, 2.19 ha, respectively), and the use of rangelands is lower here. Given the amount of rangelands per animal unit in Şanlıurfa, which is the pilot province of the project, the grazing pressure on the rangelands is at a moderate level here (0.65 ha). When these results are evaluated, it is seen that grazing pressure is more intense especially in provinces with limited rangelands. Especially in these provinces, it is important to prepare grazing plans and implement practices for holistic grazing management.

Table 16. Size of rangelands per animal unit on a provincial basis.

Province name*	Geographical Region	Overlapping with the potential steppe zone (%)	Unit of rangeland/ total number of livestock **
Ağrı	Eastern Anatolia	99	0.04
Kars	Eastern Anatolia	93	0.12
Batman	Southeastern Anatolia	79	0.14
Ankara	Central Anatolia	86	0.19
Diyarbakır	Southeastern Anatolia	91	0.20
Mardin	Southeastern Anatolia	100	0.22
Çorum	Black Sea	61	0.27
Yozgat	Central Anatolia	89	0.35
Kırşehir	Central Anatolia	100	0.35
Iğdır	Eastern Anatolia	100	0.36
Elâzığ	Eastern Anatolia	80	0.38
Aksaray	Central Anatolia	100	0.43
Konya	Central Anatolia	86	0.61
Kırıkkale	Central Anatolia	100	0.64
Şanlıurfa	Southeastern Anatolia	100	0.65
Niğde	Central Anatolia	92	0.65
Nevşehir	Central Anatolia	100	0.73
Eskişehir	Central Anatolia	59	0.77
Ardahan	Eastern Anatolia	77	0.80
Çankırı	Central Anatolia	63	0.98
Malatya	Eastern Anatolia	88	1.02
Bayburt	Black Sea	98	1.08
Kayseri	Central Anatolia	90	1.22
Erzurum	Eastern Anatolia	64	1.25
Karaman	Central Anatolia	69	1.39
Sivas	Central Anatolia	82	2.19
Erzincan	Eastern Anatolia	66	2.93
Van	Eastern Anatolia	87	3.36

Province name*	Geographical Region	Overlapping with the potential steppe zone (%)	Unit of rangeland/ total number of livestock **
Muş	Eastern Anatolia	24	0.08
Afyonkarahisar	Aegean	35	0.09
Şırnak	Eastern Anatolia	24	0.10
Adana	Mediterranean	2	0.16
Tokat	Black Sea	14	0.19
Gaziantep	Southeastern Anatolia	29	0.20
Mersin	Mediterranean	2	0.22
Siirt	Southeastern Anatolia	25	0.26
Adıyaman	Southeastern Anatolia	39	0.28
Kilis	Southeastern Anatolia	39	0.30
Bitlis	Eastern Anatolia	28	0.42
Kahramanmaraş	Mediterranean	29	0.68
Bingöl	Eastern Anatolia	1	1.09
Giresun	Black Sea	9	1.24
Hakkâri	Eastern Anatolia	26	1.27
Tunceli	Eastern Anatolia	11	1.40
Artvin	Black Sea	4	1.89
Gümüşhane	Black Sea	43	2.00
Rize	Black Sea	2	4.93

Provinces whose surface area overlap with the potential steppe zone by <50% are shown in gray. Provinces where the overlap is lower than 1% are not shown.

**Grazing pressure:* The amount of rangeland per unit of animal calculated using a bovine unit. Coefficients for animal species are given in Table 15. Since the livestock statistics reflect the total in the province, total rangeland size in the province was used as the rangeland value regardless of the potential steppe zone in order to make the assessment comparable.*

3.2.2. Population Density

One of the greatest threats to steppes is intensity of human activity. Activities such as encroachment of settlements towards natural areas, and road and house constructions directly threaten the steppes. There is no spatial data that provide direct information on where and how human activities have an impact in the province; therefore, the population data are used as an indicator that can provide information about the intensity of human activities. It has been acknowledged that the pressure on natural areas will be higher in and around densely populated areas.

The spatial distribution of the settlements in the potential steppe zone in Turkey is given in Figure 13 according to CORINE 2018 Land Use and Land Cover Data. In order to assess the effects of population density on the steppes, the district and provincial data for 2019, which were obtained from TÜİK, were spatialized (Figure 29, Figure 30).
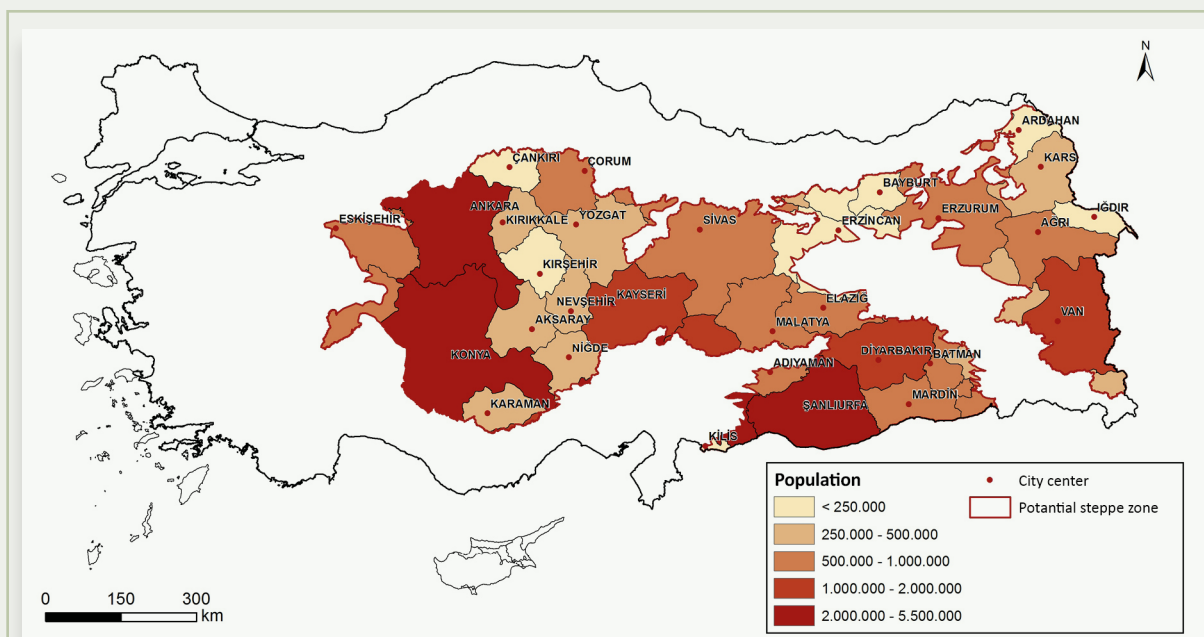
Figure 29. The population map by provinces within the potential steppe zone in Turkey. (Data Source: TÜİK Population Statistics data).
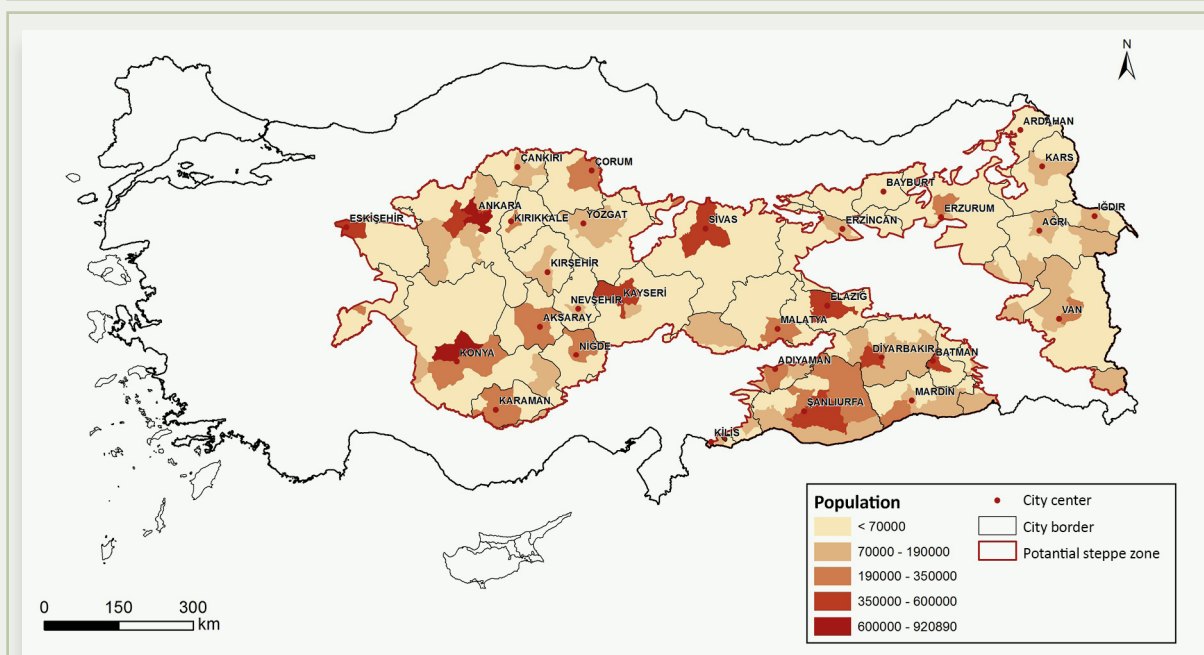
Figure 30. The population map by districts within the potential steppe zone in Turkey. (Data Source: TÜİK Population Statistics data).

Furthermore, in order to examine human activities better spatially, an additional analysis was carried out using the night lights layer (Version 4, DMSP OLS) computed with visible spectra and near infrared bands compiled from NOAA (National Oceanic and Atmospheric Administration) Meteorological satellite as an indicator of the intensity of human activities. According to these analyses, Ankara, Konya, Şanlıurfa, Diyarbakır and Kayseri stand out as the areas where the proportion of steppe area is high, and the population is dense. Therefore, these are the provinces where measures against the human activity should be taken (Figure 31, Table 7). These two analyses provide information on the current population density and urbanization. The issue of which areas the city will encroach in the future is also important and should be taken into account while planning

the conservation actions. Thus, it will only be possible to make effective planning considering both present and future conditions. Steppe ecosystems are irreversibly destroyed as a result of urbanization pressure from new settlements. During the preparation of Environmental Plans, the value and importance of the steppe ecosystems should be emphasized, and a targeted planning approach should be adopted for the conservation and sustainable management of these habitats. Finally, there has been an increase in reverse migration in certain areas in recent years. However, this threat, which may cause degradation of vegetation in steppes, could not be mapped in the absence of spatial data.

Figure 31. Spatial representation of the city lights of Turkey with the steppe areas. (Data Source: NOAA nightlights data).
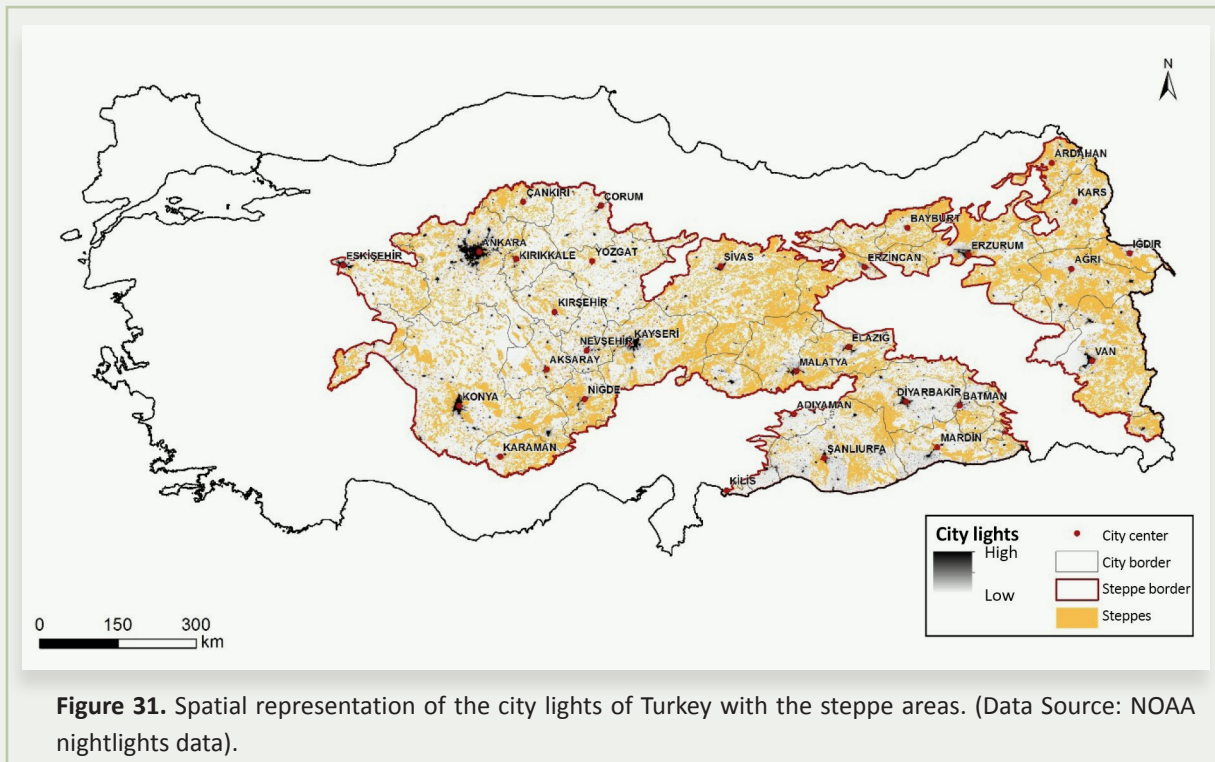
3.2.3. Drought risk

Climate change is one of the most threatening factors for steppe ecosystems, similar to all natural ecosystems. It is suspected that steppes, which are already arid, will be threatened with further drought (semi desertification) due to the potential increase in temperatures and decrease in precipitation. Drought risk was used for determination of where the temperature (lowest and highest) and annual precipitation will change the most in 2070 compared to today. The future projections were calculated using RCP 8.5, one of the IPCC 5th Assessment Report (2013) scenarios. Within this scope, the Emberger Aridity Index (Emberger, 1955) was used[7].

According to the Emberger Aridity Index, Konya, Şanlıurfa and Iğdır, stand out as the driest areas today (Figure 32). The climate classes determined according to the Emberger Aridity Index show that most of the areas inside the potential steppe zone fall in the semi-arid (22,136,089 ha) climate class. Arid areas span 218,933 ha, while semi-temperate areas span 11,178,386 ha. The driest region seems to be Iğdır (Figure 33).

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7. The Emberger Aridity Index was calculated using the variables of total annual precipitation, maximum temperature in the hottest month, minimum temperature in the coldest month according to the following formula:

$$2000 * BIO_{12}/((BIO_5 - BIO_6) * (BIO_5 + BIO_6 + 546.24))$$

Bio12: Total annual precipitation (mm)
Bio5: Average maximum temperature of the hottest month
Bio6: Average minimum temperature of the coldest month
For calculating the Emberger Aridity Index, the climate surfaces from the WorldClim (https://www.worldclim.org/bioclim) database were used.
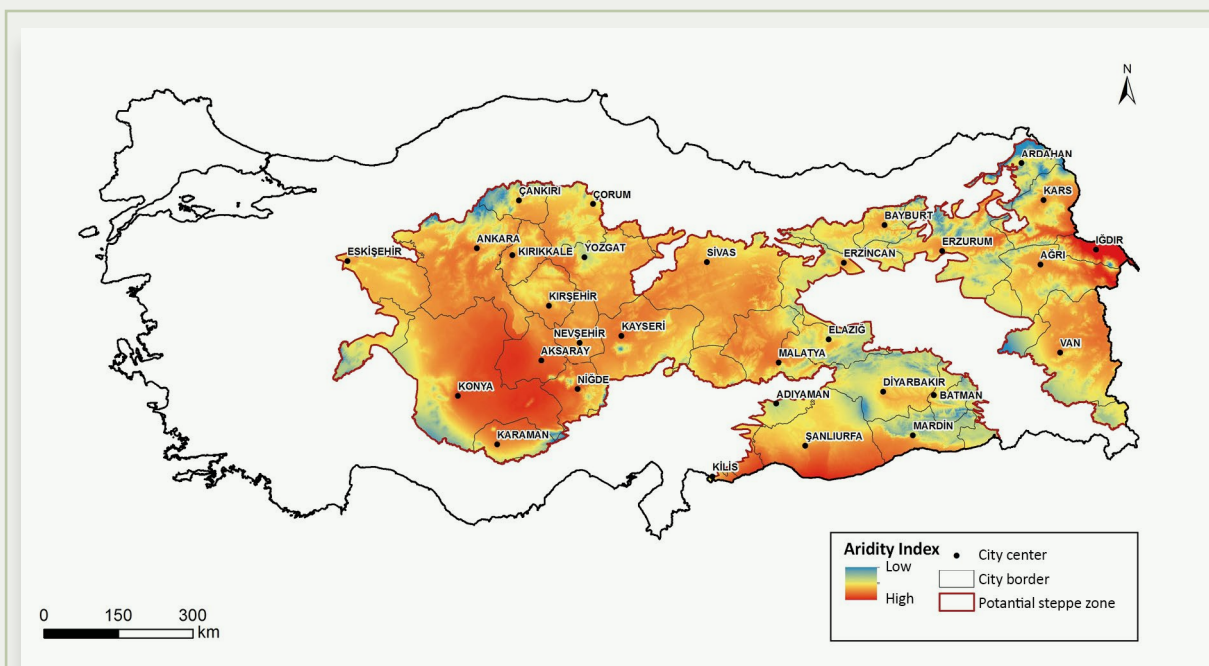
Figure 32. The current drought values according to the Emberger Aridity Index. (The map is produced using Worldclim data).
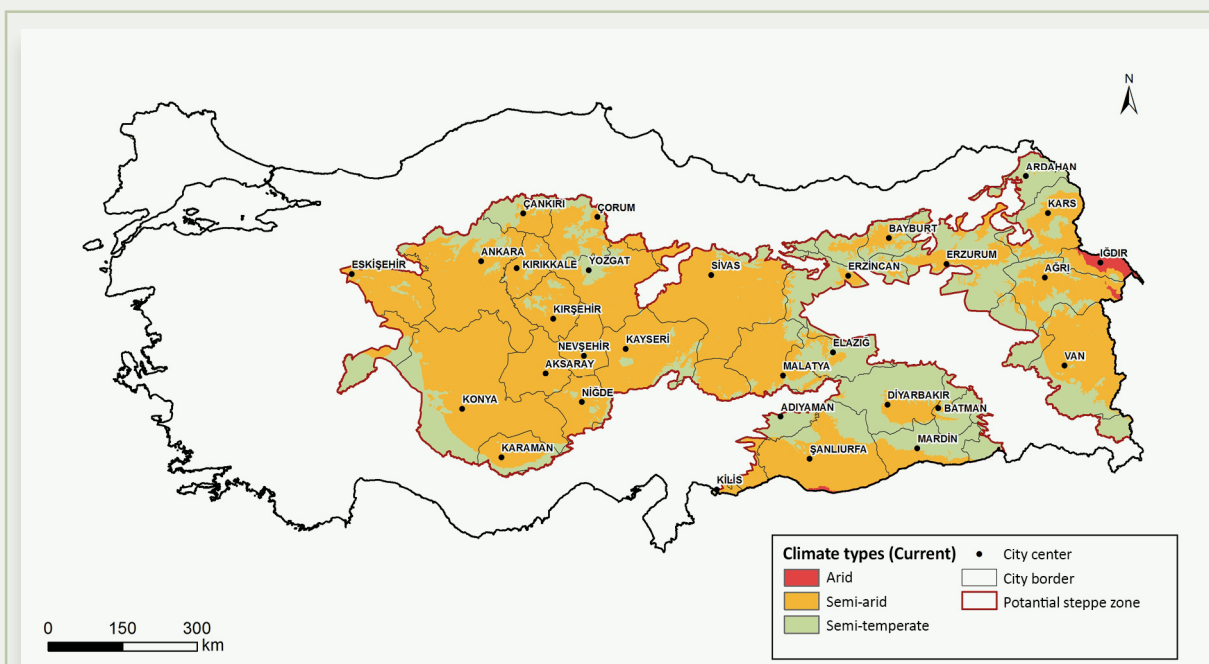
Figure 33. Current climate types within the potential steppe zone calculated according to the Emberger Aridity Index. (The map is produced using Worldclim data).

According to the scenarios for 2070, in all provinces within the potential steppe zone, an increase in drought by 3-24% is expected to happen in the future (Figure 34). The areas where this increase will be the most severe include Afyonkarahisar-Konya-Karaman-Niğde regions. It is observed that the drought increase will also be high in the districts to the south of Şanlıurfa. When an assessment is made according to the future climate classes, it is predicted that the southeast of Konya, Karaman, Aksaray, Niğde and some parts of Şanlıurfa will transition from semi-arid climate to arid climate. According to future projections, dry areas are expected to

expand to 2,506,675 ha, and semi-arid areas 26,132,972 ha. A decrease is also projected in areas that fall in the semi-temperate climate zone. These areas, which cover 11,178,386 hectares of land today, are expected to fall to 4,893,761 hectares in future scenarios. It is predicted that the part of Afyon within the potential steppe zone and the areas in the southwest of Konya will transition from semi-temperate to semi-arid climate (Figure 35). Konya and Şanlıurfa are among the provinces where steppes span large areas and some of the steppes enjoy legal protection in the form of protected areas. For management of steppes both within the boundaries of protected areas and those that do not have a legal protection status, it is important to start taking precautions against the expected drought in the future.

Figure 34. Changes in drought risk in 2070 according to the Emberger Aridity Index. (The map is produced using Worldclim data).

Figure 35. Future (2070) climate classes within the potential steppe zone calculated according to the Emberger Aridity Index. (The map is produced using Worldclim data).
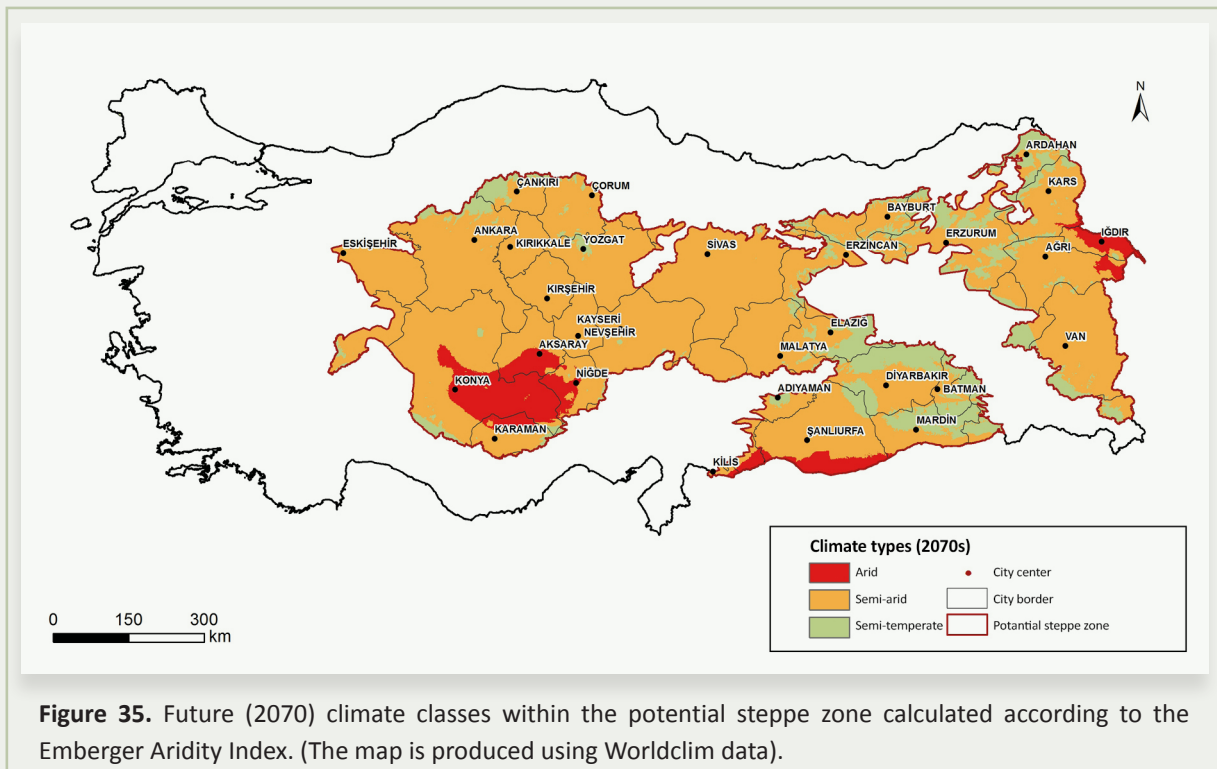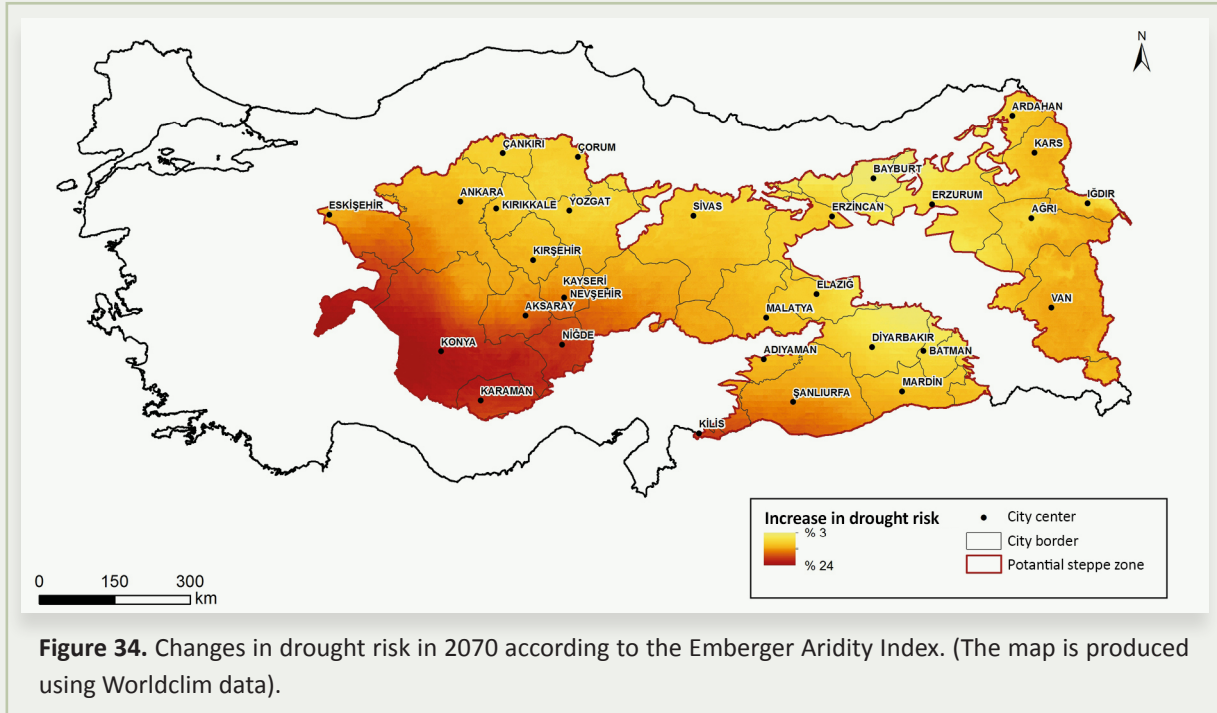
3.2.4. Erosion Risk

Erosion risk is also one of the important threats that affects steppe ecosystems and other natural ecosystems alike. In Turkey, there are erosion risk models (ÇEM, 2017), but within the scope of this assessment they could not be used because the spatial data could not be obtained. In this context, in order to address the erosion risk on the steppe ecosystems, the outputs of the Rusle-based Global Erosion Model with coarse resolution were used (Borrelli et al., 2017). According to this model with a resolution of 25 km, Diyarbakır, Mardin, Batman, Erzincan, Ardahan, Kars and Van are the areas with high erosion risk (Figure 36). Among these, Van, Erzincan and Ardahan are the cities where especially the steppes are used as rangelands and the livestock is dense. In this context, it is very important to carry out rangeland improvement activities to reduce erosion in these provinces. These evaluations were made with the outputs of the coarse-scale global erosion model. Using higher resolution erosion risk data is important in better addressing the erosion threat in the steppes.

Figure 36. National erosion risk in line with the outputs of the Rusle-based Global Erosion Model. (The map is produced using the data from Borrelli et al., 2017).
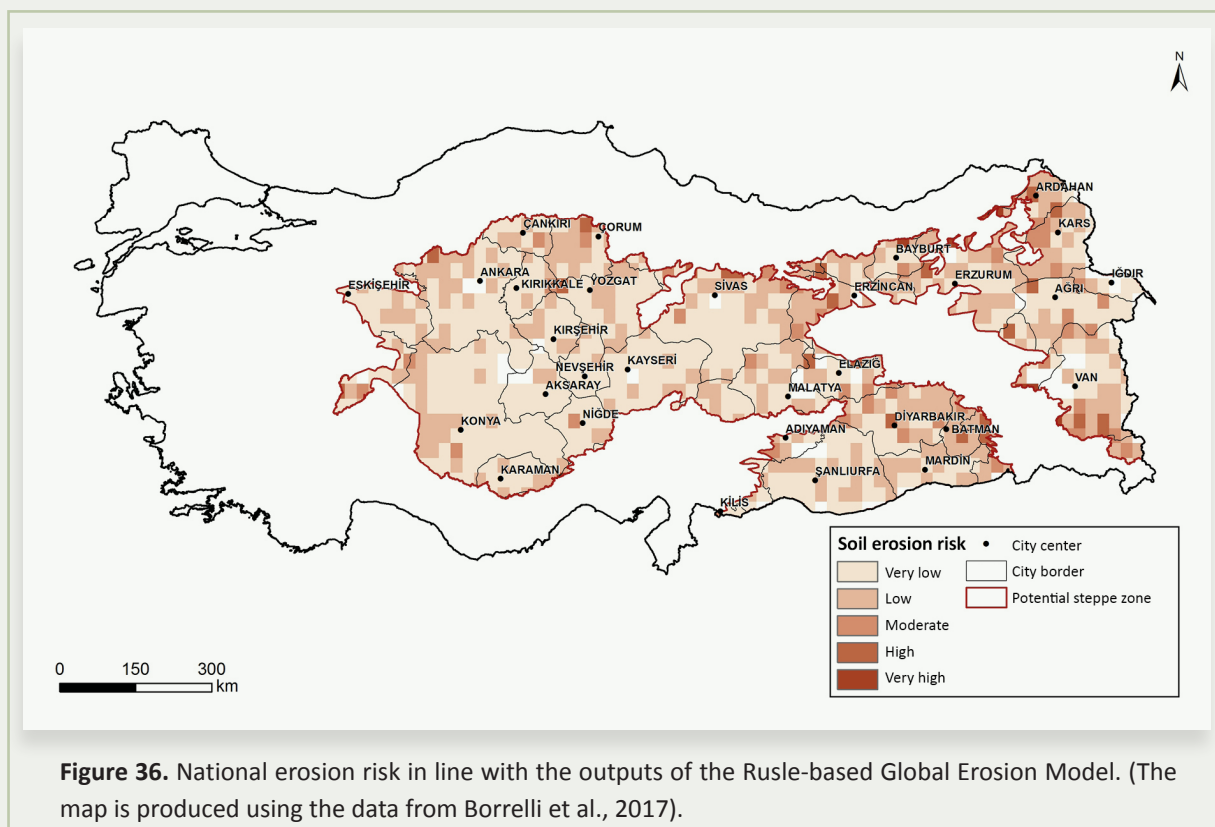
In this part of the Strategy, spatial evaluations of Turkey's steppes were made, and the current situation of the steppes and the related threats were analyzed spatially. When the threats to the steppes are assessed collectively, it is seen that threats are the most severe in the steppes of Konya, Diyarbakır, Şanlıurfa, Van and Ankara. Ağrı also stands out with high grazing pressure, as the number of livestock per unit of rangeland is high in the face of limited rangeland resources. In these provinces and other areas where steppe cover is dense, efforts for conservation and sustainable management of steppes are becoming increasingly important. Within this context, this Strategy and Action Plan was produced with a view to reducing the threats to the steppes and defining the conservation and sustainable development goals.

4. National Steppe Conservation Strategy

National Steppe Conservation Strategy and Action Plan includes a conservation strategy adopted by all parties and actions to achieve the goals and objectives of this Strategy. This Strategy and Action Plan provides a framework that can be renewed and updated as the goals are achieved, and the conditions change.

While preparing the National Steppe Conservation Strategy and Action Plan, the international conventions and programs, laws and regulations, policy documents, strategy, action plans and relevant legislation related to the steppe ecosystems were examined and incorporated into this study.

The general goal of the National Steppe Conservation Strategy is to ensure the sociological, ecological and economic sustainability of the steppes. The Strategy defines the goals and objectives for the conservation of steppes in line with this main goal.

4.1.   Strategic Goals and Objectives for the Conservation of the Steppes

Four strategic goals and 12 strategic objectives that address the current situation of the steppes, spatial evaluations regarding the steppes, and the policies, legislation, and practices related to the steppes constitute the general framework of the Strategy.

The Strategy adopts a specific approach from the governance of the steppes to the monitoring and complementarity. With this approach in mind, the first strategic goal is to create an enabling environment and develop policies, which is one of the most important needs for the effective management of the steppes. The second strategic goal is to ensure the conservation of steppe biodiversity in relation to the objectives of the Convention on the Biological Diversity and the National Biodiversity Strategy and Action Plans (2007 and 2018-2028), and the third one is to improve the use of resources in steppes within the framework of the sustainability principle. The fourth strategic goal is to improve the livelihoods of the local people who benefit from the steppes. Increasing the welfare of the local people, who benefit from the steppes, as well as other strategic goals, is one of the desired results in the long run. The strategic goals and objectives are given below.

STRATEGIC GOAL   1. Creating an enabling environment and developing policies to ensure effective management of the steppes

Objective 1.1. Development and implementation of a governance model for the steppes

Objective 1.2. Strengthening the legal and administrative structures for the conservation and effective management of the steppes

Objective 1.3. Developing research, monitoring and technology capacities for the conservation and effective management of the steppes

STRATEGIC GOAL 2. Conservation of the steppe biodiversity (at ecosystem, species, genetic and ecological diversity levels)

Objective 2.1. Conservation of the steppe ecosystems

Objective 2.2. Conservation of the steppe species and their habitats

Objective 2.3. Conservation of the genetic resources of steppes

Objective 2.4. Increasing the adaptive capacity of the steppes against climate change

Objective 2.5. Promoting the biodiversity-related value of the steppes and increasing its visibility

STRATEGIC GOAL 3. Improving the use of resources in the steppes within the framework of the sustainability principle

Objective 3.1. Disseminating agricultural practices supporting steppe biodiversity

Objective 3.2. Ensuring sustainable and ecosystem-based rangeland management

STRATEGIC GOAL 4. Improving the livelihoods of the local people who benefit from the steppes

Objective 4.1. Establishing the essential environment to increase the added value of plant production and animal husbandry practices in steppes and related areas and their benefits to the local people

Objective 4.2. Diversifying and supporting the income-generating activities for local people based on sustainable use of steppes

4.2. Situation Assessment for the Strategic Goals and Objectives (SWOT)

The method of SWOT analysis was used to comprehend the current situation regarding the conservation and management of the steppes. SWOT (Strengths-Weaknesses-Opportunities-Threats) analysis is a technique used to determine the strong areas of an institution, system, individual or service, which is open to improvement, and the opportunities and threats faced by them in the external environment. "Strengths" and "Opportunities" are classified as positive issues while "Weaknesses" and "Threats" are classified as issues that require attention.

The current situation regarding the conservation and management of the steppes on the national scale is evaluated below in the form of strengths and weaknesses, opportunities and threats. This evaluation is also reflected in the Strategy and Action Plan on the basis of objectives and actions (Table 17).

Table 17. SWOT Analysis for the Steppes (Strengths, Weaknesses, Opportunities and Threats)

STRENGTHS	WEAKNESSES
· Presence of the natural steppes · National and global protected area statuses and protected areas · Biodiversity values, rich cultural heritage and originality of the steppes · Legislation on rangelands, soil conservation and land use · Priorities and measures regarding the conservation and management of biodiversity in the national policy documents · All authorities and responsibilities related to nature conservation, rangelands and agricultural fields gathered under a single ministry and a strong local organization structure · Custom of cooperative working between the organizations · Research, monitoring and technology development infrastructure · Eco-friendly agricultural practices and support programs · Awareness of the problems of and threats to the steppes and the initiation of the Strategy process · Several ongoing studies and projects (such as the Provincial Biodiversity Inventory and Monitoring Project and the Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project) which take the steppe biodiversity in the region into account	· Lack of awareness about the importance of the biodiversity of the steppes · Steppes being considered unclaimed · Lack of legislation and institutions directly responsible of the steppes · Incomplete delimitation of the current steppe areas · Underrepresentation of the steppes in the protected areas system · Inadequate implementation and monitoring regarding the cooperation (data, information management and sharing) between different institutions for the conservation and management of steppes · Insufficient monitoring of the steppe species and habitats · Areas not registered in land registry not registered as steppes as well · Conflict of authorities and responsibilities between the relevant institutions for the conservation of steppes · Absence of penal sanctions in the Pasture Law; non-enforcement of the legislation as the allocation procedures could not be completed, and lack of coordination on grazing among the relevant laws · Rangelands allocated to the settlements instead of private or legal persons; giving grazing rights to all residents, and uncontrolled nomadic animal husbandry · Ineffective work of rangeland management unions · Lack of legislation that could increase efficiency of the Pasture Law and conservation of rangelands by creating a Legal Entity for the Rangelands · Insufficient sharing of authority, powers and responsibilities at the local level and uncertainties in administrative limits and powers for the conservation of rangelands · Lack of consideration of biodiversity elements during the rehabilitative works in rangelands

	· Lack of training and awareness-raising programs on the steppes for different interest groups · Insufficient agricultural policies, incentives and supports for the conservation of steppes and biodiversity · Inability to go beyond the model practices when it comes to climate friendly practices and conservation agriculture that support steppe biodiversity
OPPORTUNITIES	**THREATS**
· Biodiversity-oriented international commitments and 2030 goals · Strong non-governmental organizations in the field of environmental and nature conservation · Universities and institutes conducting research on the steppe areas and their biodiversity · National and international projects · Increased awareness of deterioration (drought - species extinctions) · Traditional and sustainable rangeland use principles	· Overuse of the natural resources due to the rural poverty, intensive agriculture and animal husbandry · Policies supporting use rather than conservation · Out-of-purpose use demands and political pressures on land uses · Bio-trafficking and increased threats to genetic resources · Encroachment of settlements due to migration and population growth · Regional differences, and resistance of the socio-cultural structures at the local level to the changes required for sustainable resource management · Abandonment of the traditional and sustainable practices with changing socio-cultural structures · Adverse effects of climate change and drought · Increased pollution from industrial facilities · Increased investment demands in steppe ecosystems (quarries, mining, transportation networks, etc.)

Box 4. Gap Analysis

A gap analysis constitutes a baseline for preparation of a national steppe conservation strategy and action plan. This analysis used multifaceted methods and approaches and provided key results that are reflected in the different parts of the Strategy and Action Plan.

The gap analysis includes following studies;

i) An assessment of the current situation regarding the policies, legislation and mechanisms as well as institutional structures and capacities at the national level related to the conservation and sustainable management of the steppes is given in *Section 2.8 The Legal Framework and Institutional Structure Related to Steppes*.

ii) A spatial assessment of the current situation with respect to the conservation of steppes specifically in protected areas and important biodiversity areas, with attention given to the distribution of steppes and steppe forests related to geographical regions and provinces; and threats to and pressures on the steppes of Turkey. The study is based on a desk study as well as outcomes of the workshops and meetings. Given in *Section 2. The Steppes of Turkey* and *Section 3. The Spatial Assessments Regarding the Steppes of Turkey*.

iii) A SWOT Analysis was used as a tool for analysis of internal (strength and weakness) and external factors (opportunity and threat) affecting the conservation and management of steppes at national level. The study is based on outcomes of the workshops and meetings. Given in *Section 4.2. SWOT Analysis of the Strategic Goals and Objectives*.

Key results of the gap analysis:

· *Policies, Legislation and Mechanisms:*

There is no definition of steppes in the legislation unlike forests and wetlands. The steppe ecosystems of Turkey comprise natural steppes, meadows, rangelands and steppes with trees that are managed by different institutions according to different laws and regulations. Although there is no single institutional structure responsible for the conservation and management of the steppes, there is capacity and various mechanisms distributed within different institutions. Based on these findings, a further assessment was provided to demonstrate a scheme for institutional structuring at national and local levels with regards to conservation and management of steppes. Besides, overlaps and gaps in key issues were revealed by examining legislation together with duties and responsibilities of the institutions. These results all revealed the importance of governance and collaboration mechanisms for sustainable management of the steppes, which is addressed under Strategic Goal 1.

· *Distribution Mapping and Spatial Assessment:*

The outcomes of these assessments revealed that the region of steppe and steppe forest ecosystems in Turkey (areas that form sparse or closed forests, within the ecological regions dominated by steppes) span an area of approximately 33.5 million hectares. According to the analyses, there are approximately 17 million ha of steppe area and 552,334 ha of steppe forests within the potential steppe zone. Of the 17.5 million ha, 42% is in Central Anatolia, 36% in Eastern Anatolia, 14% in Southeastern Anatolia, 5% in the Black Sea region, 2% in the Mediterranean region and 1% in the Aegean Region. In the region with potential steppes and steppe forests of Turkey, there are 75 protected areas, and approximately 4% of 33.5 million hectares is under protection. Of steppes and steppe forests (about 17.5 million ha) within the potential steppe zone, 2.9% is legally protected.

· *SWOT Analysis*

The presence of natural steppes and their biodiversity, existence of core legislative and administrative mechanisms, and existing institutions and studies were strengths whereas lack of awareness of the importance of steppes, inefficient governance, coordination and cooperation issues, difficulties regarding the pasture law were weaknesses primarily indicated. The international commitments, presence of NGOs, universities and existing studies were opportunities while overuse of natural resources and policies supporting use rather than conservation, increased settlement and investment pressure, impact of climate change and drought were external threats indicated. The outcomes of the analysis laid a foundation for the formulation of the Strategy.

5. National Steppe Conservation Action Plan

The National Steppe Conservation Action Plan includes actions to achieve the identified strategic goals and objectives. The timetable for the realization of the actions within the scope of the Action Plan is determined as 2021-2023 (short term), 2021-2026 (medium term) and 2021-2030 (long term). For each action to be carried out, responsible and relevant institutions were specified with a view to emphasizing the importance of cooperation between the institutions in order to successfully implement relevant actions and to be a guide in this regard.

In addition, for the monitoring and evaluation of the action plan and revision when necessary, a larger set of indicators for both targets and actions, and baselines and endlines of these indicators were given.

5.1.   Actions to Achieve the Strategic Goals and Objectives

Priority and strategically important issues in line with the actions determined to achieve the strategic goals and objectives are given below.

5.1.1. Strategic Goal 1

Creating an enabling environment and developing policies to ensure effective management of the steppes

Strengthening the legal and administrative structures in addition to the development and implementation of a governance model that can support the conservation of the steppes, which currently falls within the powers and responsibilities of different institutions, by means of different laws and regulations is fundamentally required.

The main coordinating agency for the National Steppe Conservation Strategy and Action Plan will be the "Sub-Committee for the Execution of the Convention on the National Basis" under the National Biodiversity Coordination Board. A commission can be established by this Sub-Committee to ensure effective participation in the decision-making regarding the steppes and to act as an advisory board regarding the authorities and responsibilities of the institutions. This commission is expected to take an active role in the implementation, monitoring and evaluation of the Strategy and Action Plan. For the implementation of the governance mechanism, it is important to foster cooperation and ensure effective communication between relevant institutions and stakeholders. Doing the necessary works to bridge the gaps in the existing legal and administrative structures and establishing new legal structures and regulations are priority actions here. Making recommendations in these matters and conducting analyses of the legislation and institutional structures related to biodiversity and protected areas can provide important outputs for the conservation of steppe biodiversity.

In addition, actions to meet the capacity needs in areas of human resources, research, monitoring and technology that can contribute to the conservation and management of the steppes are defined.

The indicators determined at the level of objectives are given below:

i)   An effective governance mechanism

ii) The number of legal and administrative regulations on the effective management of steppes (in numbers)

iii) Changes in steppe-related data and information generation, sharing and use (in percentages)

5.1.2. Strategic Goal 2

Conservation of the steppe biodiversity (at ecosystem, species, genetic and ecological diversity levels)

In the Convention on Biological Diversity and national policy documents, the conservation of biodiversity, its sustainable use and fair sharing of the benefits arising from the use of genetic resources represent the most basic principles. In this Strategy and Action Plan, conservation of the steppe ecosystems, species and habitats, and genetic resources is a priority objective of strategic importance. In this context, the conservation proposals regarding biodiversity are handled separately under the first two objectives. Under the first one, the main actions are to increase the coverage of protected areas including priority steppe areas, to develop conservation proposals by evaluating different study results (e.g. Sites of Importance identified as a result of the National Biodiversity Inventory and Monitoring Project, Systematic Conservation Planning (SCP) Priority Conservation Areas, Prime Butterfly Areas (PBAs), candidate Natura 2000 sites, Key Biodiversity Areas (KBAs), Important Plant Areas (IPAs), Important Bird Areas (IBAs), etc.), to monitor Sites of Importance including steppe areas, and to determine ecological corridors. As for the second one, main actions include determining the priority steppe species and their habitats, preparation, implementation and monitoring of species action plans, especially for steppe-specific species, and conservation of steppe species and habitats in the existing protected areas in cooperation with the local people. Recording the plant and animal species in the steppes that may be important in terms of genetic resource quality and conserving them ex-situ, recording traditional knowledge and sharing innovative practices are recommended in this regard. Emphasis is put on these actions being carried out through participatory processes that will ensure cooperation between relevant institutions and stakeholders and effective participation of the local people. In addition, legal and administrative regulations at the national level that support the conservation of steppe biodiversity will contribute to the creation of an enabling environment to achieve these goals.

Importance of increased adaptive capacity of steppe ecosystems to climate change, which represent one of the most sensitive ecosystems, is demonstrated in international conventions and national policy documents. Identifying and monitoring the possible effects of climate change on the steppe ecosystems, developing adaptation proposals, accordingly, preparing and implementing adaptation plans, creating and implementing monitoring programs are the main actions here.

Based on the Convention on Biological Diversity and national policy documents, creating awareness about biodiversity values and the conservation and sustainable use of biodiversity is defined as one of the primary goals. Increased knowledge and awareness among the steppe interest groups about the biodiversity values of steppes is included as one of the basic principles to ensure their participation in the processes. In this direction, actions are defined to create the physical structure that will contribute to the promotion, information, communication and education activities in order to increase awareness about the biodiversity values of steppes, to provide synergy between relevant practices in the region and to disseminate good practices.

In addition, the national and regional tourism plans are considered to create an important opportunity for nature tourism and ecotourism practices considering sustainable use of steppes and their biodiversity. It is also emphasized that all these actions are planned and implemented in cooperation with relevant stakeholders.

The indicators determined at the level of objectives are given below:

> i)   *Change in surface area of the steppes (in percentages)*
>
> ii) *Change in surface area of the protected steppe areas (in percentages)*
>
> iii) *Effective management of protected steppe areas (in percentages)*
>
> iv) *Number of effectively protected steppe species (in numbers)*
>
> v)   *The number of steppe species that are effectively protected for genetic resources (in numbers)*
>
> vi) *The number of practices regarding adaptation to climate change in (numbers)*
>
> vii) *Number of persons reached for the promotion and visibility of steppes (in number of persons)*

5.1.3. Strategic Goal 3

Improving the use of resources in the steppes within the framework of the sustainability principle

In the international covenants, the importance of promoting the sustainable resource management is emphasized. Main actions here are the creation and dissemination of agricultural production and support models that support the steppe biodiversity for sustainable resource use in the steppes, and provision of sustainable and ecosystem-based rangeland management. The most important tools in realizing these strategies would be the cooperation between relevant institutions and stakeholders and engagement of local people in sustainable use and management of resources.

In this context, establishment and dissemination of model support programs for environmentally-friendly agricultural practices and dissemination of agricultural practices that support biodiversity are handled primarily. Exemplary programs and practices on this subject, such as EFALP and IPARD, provide important tools. In addition, support and incentive mechanisms that can ensure the implementation and continuity of biodiversity-friendly agricultural practices, especially in priority steppe areas and their surroundings, are defined.

Priority actions geared towards the conservation of the steppes, most of which are used as rangelands, and sustainable and ecosystem-based rangeland management are as follows: Planning rangeland improvement activities in a way to take into account biodiversity factors, addressing rangeland improvement works with rangeland management projects as a whole, monitoring the rangeland improvement activities effectively, and developing, supporting and disseminating best practices for sustainable and restorative rangeland management. In particular, model practices and pilot and demonstration projects planned with a cooperative approach are important tools for the implementation of sustainable and ecosystem-based rangeland management. In addition, legal and administrative regulations at national level that support the conservation and sustainable management of rangelands will contribute to the creation of an enabling environment to achieve this goal.

Solving the settlement and education problems of nomadic families living in steppes, who account for one of the vulnerable groups, and encouraging and supporting income-generating activities for the nomads are also considered under this goal.

The indicators determined at the level of objectives are given below:

> i) *Changes in agricultural practices in favor of biodiversity (number of farmers or area of land)*
>
> ii) *Changes in surface area under sustainable and ecosystem-based rangeland management (in percentages)*

5.1.4. Strategic Goal 4

Improving the livelihoods of the local people who benefit from the steppes

Increasing awareness of the local people on steppe biodiversity and encouraging them to take part in the sustainable use of steppe resources effectively are the basic principles for the conservation of steppe biodiversity. Supporting the traditional, sustainable natural resource use of the local people whose livelihood is based on the steppe ecosystem is handled primarily. In this context, one of the most important steps is to increase the added value of plant production and animal husbandry practices in the steppe and related areas. Accordingly, making basic socio-economic research in priority steppe areas and obtaining information on the vulnerable groups will provide an important basis for all future studies on the livelihoods. Organized work and cooperation in rural production in steppes and related fields is defined as one of the most important tools for the success of the efforts.

Within the scope of the first objective, conducting socio-economic research, value chain analysis and geographical indication and marking studies to increase productivity and added value are priority actions. In this context, it is important to mobilize both national and regional structures in order to mobilize existing resources and create new resources and supports.

Another important objective is to diversify and support the livelihoods of the local people in order to reduce the pressure on the steppes and to ensure sustainable use of the steppes. Accordingly, it is necessary to identify and support alternative sustainable livelihoods for the rural development in the steppe ecosystems, starting with priority steppe areas and their surroundings. Actions that will ensure coordination and cooperation with existing institutional structures and mechanisms that provide an important tool in this regard are defined.

In addition, one of the main principles is that women benefit from training and other services equally, given their special needs and their roles in the household.

The indicators determined at the level of objectives are given below:

> i) *The number of studies aimed at increasing the added value of plant production and livestock practices and their benefits to the local people (in units)*
>
> ii) *Changes in household incomes of families benefiting from supported activities and best practices (in percentages)*

Box 5. Mainstreaming steppe conservation into productive landscapes

The strategy and action plan supports steppe conservation in both the protected areas and the productive landscapes. The mainstreaming options of steppe conservation into productive landscapes provided under the strategic goals are listed below:

i)   A governance model, and legislative and administrative regulations to support conservation and management of steppes in both protected areas and productive landscapes. (Strategic Goal 1)

ii) Informed decision making towards landscape level steppe conservation supported through governance, coordination and monitoring mechanisms. (Strategic Goal 1)

iii) Steppe conservation principles integrated into sectoral policies and programmes, strategies and planning documents. (Strategic Goal 1)

iv) Knowledge, capacity and tools developed to integrate steppe conservation principles into both protected areas and productive landscapes. (Strategic Goal 1)

v)   Steppe conservation principles integrated into the afforestation works (Strategic Goal 2)

vi) Particular steppe conservation proposals identified, implemented and monitored in both protected areas and productive landscapes (Strategic Goal 2)

vii) Preliminary studies to integrate steppe conservation data into territorial and spatial plans (Strategic Goal 2)

viii) Awareness raised and participation encouraged on sustainable use of natural resources of steppe ecosystems in productive landscapes (Strategic Goal 2)

ix) Conservation and sustainable use of steppe ecosystems integrated into national and regional tourism plans and programmes (Strategic Goal 2)

x)   Agricultural production models and support mechanisms put in place to support steppe biodiversity in both productive landscapes and protected areas including pilot support programmes to be implemented in collaboration with government institutions; incentives put in place for implementation and dissemination of climate-friendly and ecosystem-based adaptation practices (Strategic Goal 3)

xi) Steppe conservation integrated into rural development strategies, programmes and practices; support and incentive mechanisms developed for agriculture and livestock practices and new income generating activities identified and supported to improve livelihoods of local people depending on steppe ecosystems (Strategic Goal 4)

xii) Cooperation and coordination enhanced between key stakeholders across the productive landscapes and protected areas (All strategic goals)

GOAL 1. CREATING AN ENABLING ENVIRONMENT AND DEVELOPING POLICIES TO ENSURE EFFECTIVE MANAGEMENT OF STEPPES

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
	Objective 1.1. Development and Implementation of a governance model for steppes						
	Objective Indicator: An effective governance mechanism						
1.1.1	Establishing a structure that will ensure active participation in decision-making processes concerning the steppes and serve as an advisory board regarding the authorities and responsibilities of the institutions *(Establishing a "Sub-Committee for the Execution of the Convention on the National Basis" under the National Biodiversity Coordination Board or a Commission if deemed necessary)*	2021-2023	Sub-Committee/ Commission for the Implementation of the Convention on Biological Diversity on the National Basis	MoAF (GDNCNP, GDPP, GDF, GDARP, GDAR, relevant service units), MoEU (GDPNA, GDSP, GDEM), Ministry of Culture and Tourism, Ministry of Industry and Technology (GDDA), Relevant Universities, Relevant NGOs, Private sector	Endorsement of the National Biodiversity Coordination Board	0	1
1.1.2	Determining cooperation issues, ensuring and monitoring cooperation for the use of responsibilities and powers of institutions for common purposes of protection and management of steppes	2021-2030	Sub-Committee/ Commission for the Execution of the Convention on the National Basis	MoAF (GDNCNP, GDPP, GDF, GDARP, GDAR, relevant service units), MoEU (GDPNA, GDSP, GDEM), Ministry of Culture and Tourism, Relevant Universities, Relevant NGOs, Private sector	Number of implemented joint activities	0	2
1.1.3	Ensuring implementation of priorities of the National Steppe Conservation Strategy and Action Plan by means of national and regional development plans, institutional and sectoral plans and programs	2021-2026	Sub-Committee/ Commission for the Execution of the Convention on the National Basis	MoAF (Directorate of Strategy Development, GDNCNP, GDPP, GDPP, GDF, GDAR, Ministry of Treasury and Finance, Regional Development Administrations, Development Agencies, Relevant Local Governments, Relevant Universities, Relevant NGOs, Private Sector	Number of plans and programs this Strategy and Action Plan is incorporated into.	0	5

GOAL 1. CREATING AN ENABLING ENVIRONMENT AND DEVELOPING POLICIES TO ENSURE EFFECTIVE MANAGEMENT OF STEPPES

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
1.1.4	Preparation of provincial steppe conservation strategy and action plans by taking Şanlıurfa Steppe Conservation Strategy and Action Plan as the basis	2021-2030	MoAF	MoAF relevant service units, Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of steppe conservation strategies and action plans on provincial basis	1	6
1.1.5	Monitoring and evaluation of the National Steppe Conservation Strategy and Action Plan, reporting and sharing it annually, making suggestions for the revisions according to the monitoring results, discussing the proposals with the relevant institutions and making decisions.	2021-2030	Sub-Committee/ Commission for the Execution of the Convention on the National Basis	MoAF relevant service units, Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of reports	0	5
	Objective 1.2. Strengthening the legal and administrative structures for the conservation and effective management of steppes *Objective Indicator: The number of legal and administrative regulations on the effective management of the steppes (in numbers)*						
1.2.1	Making necessary regulations to support the conservation of steppe biodiversity by analyzing the legislation and institutional structures related to biodiversity and protected areas	2021-2030	MoAF (GDNCNP, GDPP, GDF, GDARP)	Presidency Strategy and Budget Office, MoEU (GDPNA, GDSP, GDEM), Ministry of Culture and Tourism, Relevant Universities, Relevant NGOs	Number of relevant legal regulations (regulation, communiqué, circular, etc.)	0	1

GOAL 1. CREATING AN ENABLING ENVIRONMENT AND DEVELOPING POLICIES TO ENSURE EFFECTIVE MANAGEMENT OF STEPPES

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
1.2.2	Making decisions to make sure that priority steppe boundaries and conservation proposals are taken into account in the decisions made by the Soil Conservation Boards in order to protect the steppes in Great Plains against land transformation.	2021-2026	MoAF (GDAR)	Presidency Strategy and Budget Office, MoAF Legal Department	Number of decisions taken for the conservation of steppe areas	0	5
1.2.3	Making the necessary regulations against the failing aspects of the rangeland legislation, eliminating the incompatibilities between the legal regulations and practices (especially the structures of Rangeland Commissions and Management Unions, definition and enforcement of penal sanctions grazing management planning)	2021-2026	MoAF (GDPP, GDL)	Presidency Strategy and Budget Office, MoAF General Directorate of Legal Services, MoAF All Service Units, MoEU (GDPNA), Relevant NGOs	Number of relevant regulations	0	1
	Objective 1.3. Developing research, monitoring and technology capacities for the conservation and effective management of steppes *Objective Indicator: Changes in steppe-related data and information generation, sharing and use (in percentages)*						
1.3.1	Completion of Turkey's vegetation studies and identification of the codes as per the National Habitat Classification System (also specifying the equivalents in the EUNIS classification system) with a view to achieving nation-wide adoption.	2021-2026	MoAF (GDNCNP)	MoEU (GDPNA), MoAF (GDF, GDAR, GDPP)	National Habitat Classification System	0	1

GOAL 1. CREATING AN ENABLING ENVIRONMENT AND DEVELOPING POLICIES TO ENSURE EFFECTIVE MANAGEMENT OF STEPPES

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
1.3.2	Improving the relevant monitoring interfaces in existing national databases (Noah's Ark) for monitoring the steppe biodiversity and ensuring their effective use	2021-2026	MoAF (GDNCNP)	MoAF (GDPP, GDAR, GDARP), MoEU, Relevant Universities, Relevant NGOs	Increase in data entry	0	10%
1.3.3	Ensuring that data on steppe habitats and species are integrated into the existing databases and monitoring systems of the institutions (TARBIS, MERBIS etc.)	2021-2026	MoAF (GDNCNP, GDPP, GDAR, GDARP)	MoAF Directorate of Strategy Development, Relevant Universities, Relevant NGOs	Number of databases and monitoring systems that the steppe data were incorporated into	1	3
1.3.4	Creation of a GIS-based "Decision Support Tool" (DSD) structure to implement and control action plans and to provide decision makers with fast, accurate and up-to-date data.	2021-2026	MoAF, TUBITAK MAM	MoAF (GDNCNP, GDPP, GDAR, GDARP, GDF), MoEU, Relevant Universities, Relevant NGOs	Decision Support System	0	1
1.3.5	Researching traditional and novel methods, techniques and practices that support the conservation of steppe biodiversity and sustainable use of resources, and sharing the results	2021-2026	MoAF (GDARP, GDAR, GDNCNP)	Relevant Universities, Relevant NGOs	Number of studies and publications	20	100
1.3.6	Researching steppe ecosystems and human interaction and socio-ecological processes and sharing their results	2021-2026	MoAF (GDNCNP, GDARP)	Relevant Universities, Relevant NGOs	Number of studies and publications	5	15

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at ecosystem, species, genetic and ecological diversity levels)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
Objective 2.1. Conservation of steppe ecosystems *Objective Indicator: i) Changes in surface area of the steppe areas (in percentages); ii) Changes in surface area of the protected steppe areas (in percentages); iii) Effective management of protected steppe areas (in percentages)*							
2.1.1	Increasing the surface area of protected areas including priority steppe areas determined in line with the results of the National Biodiversity Inventory and Monitoring Project	2021-2030	MoAF (GDNCNP)	MoAF (GDPP), MoEU (GDPNA), Ministry of Culture and Tourism, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Proportion of protected steppe areas in total protected surface area	4%	5%
2.1.2	Determining priority steppe areas for conservation on a national scale, bringing together different study results for this, evaluating and developing conservation proposals (e.g., National Biodiversity Inventory and Monitoring Project results, SCP, PBA, N2000, KBA, IPA, IBA, etc.)	2021-2030	MoAF (GDNCNP)	MoAF (GDPP, GDARP), MoEU (GDPNA), Ministry of Culture and Tourism, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of proposed priority conservation areas	0	62
2.1.3	Identifying steppe ecosystems within the current protected areas system, highlighting biodiversity values, translating them to plans and ensuring their effective management	2021-2030	MoAF (GDNCNP)	MoEU (GDPNA), Ministry of Culture and Tourism, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of plans with proposals for the conservation of steppe ecosystems	120	135
2.1.4	Identifying ecological corridors between priority steppe areas, determining effective conservation and sustainable use proposals in these areas, applying them and translating them to regional plans (considering the gene flow between provinces)	2021-2030	MoAF (GDNCNP)	MoAF (GDF, GDPP), MoEU (GDPNA), Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of ecological corridors	2	5

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at ecosystem, species, genetic and ecological diversity levels)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.1.5	Achieving continuous monitoring in priority areas including steppes determined as a result of the National Biodiversity Inventory and Monitoring Project and taking actions according to the results of the monitoring	2021-2026	MoAF (GDNCNP)	MoAF (GDF, GDPP), MoEU (GDPNA), Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of areas monitored	19	52
2.1.6	Establishing Long Term Steppe Monitoring Stations in different locations to represent the steppe areas in the country (monitoring parameters and certification in international norms and a modular database) and performing ecological and meteorological monitoring works	2021-2030	MoAF (GDNCNP, GDARP, GDPP)	MoAF (GDF , Meteorological Service), MoEU (GDPNA), TUBITAK, Relevant Local Administrations, Relevant Universities, Research Institutes, Relevant NGOs	Number of monitoring stations	0	2
2.1.7	Researching the functions and benefits of steppe ecosystems and transferring them to relevant plans	2021-2030	MoAF (GDPP, GDARP)	MoAF (GDNCNP, GDF, GDAR), TUBITAK, Relevant Universities, Relevant NGOs	Number of plans addressing steppe ecosystem services	1	4
2.1.8	Increasing the technical capacity of the personnel assigned in protected areas that host steppe ecosystems for the conservation and monitoring of steppe species	2021-2026	MoAF (GDNCNP)	MoAF (GDF, GDPP, GDAR), Relevant Universities, Relevant NGOs	Number of trainings/Year	2 /Year	7 /Year
2.1.9	Effectively controlling the activities that will damage the species characterizing the vegetation in priority steppe areas in cooperation with the relevant institutions and stakeholders.	2021-2030	MoAF (GDNCNP, GDPP, GDARP, GDF)	Ministry of Culture and Tourism, Ministry of Environment and Urbanization, Relevant Local Administrations, Relevant Universities, Relevant NGOs	Number of activities controlled	0	10
2.1.10	Implementing and monitoring good practices for ecological restoration of destroyed steppe ecosystems	2021-2030	MoAF (GDNCNP, GDPP, GDF)	Ministry of Culture and Tourism, Ministry of Environment and Urbanization, Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of good practices	1	3

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at ecosystem, species, genetic and ecological diversity levels)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.1.11	Integrating steppe biodiversity into afforestation practices in steppe ecosystems, and afforestation in harmony with natural habitats	2021-2026	MoAF (GDF)	MoAF (GDNCNP, GDCDE), Relevant Universities, Relevant NGOs	Increase in practices addressing steppe biodiversity	1%	2%
	Objective 2.2. Conservation of the steppe species and their habitats *Objective Indicator: Number of effectively protected steppe species (in numbers)*						
2.2.1	Implementing conservation measures for priority steppe areas and priority steppe species in cooperation with stakeholders and achieving effective protection in these areas	2021-2026	MoAF (GDNCNP, GDPP, GDARP)	MoAF (GDAR), Ministry of Culture and Tourism, Ministry of Environment and Urbanization, Relevant Local Governments, Relevant Universities, Relevant NGOs	Change in population size of threatened species	0	10%
2.2.2	Creating and sharing necessary layers at suitable scales for integrating the data of the national biodiversity inventory project for steppe ecosystems into the territorial and spatial plans	2021-2026	MoAF (GDNCNP)	Ministry of Environment and Urbanization (GDEM, GDSP), Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of layers for data sharing	2	5
2.2.3	Preparing, implementing and monitoring species action plans, with priority given to steppe-specific species, in cooperation with relevant institutions and stakeholders	2021-2026	MoAF (GDNCNP, GDARP, GDPP)	MoAF (GDAR), Ministry of Culture and Tourism, Ministry of Environment and Urbanization, Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of species action plans	5	15
2.2.4	Drafting a national red list in priority species groups for effective conservation of steppe biodiversity, and a review of species lacking data (IUCN "Data Deficient", DD)	2021-2026	MoAF GDNCNP (IUCN National Committee)	IUCN National Committee member institutions, Relevant Universities, Relevant NGOs	Number of taxa that are included in the National Red List	0	1
2.2.5	Reintroduction of priority steppe species to places where they were previously distributed, carrying out studies to include new species and active monitoring	2021-2026	MoAF (GDNCNP, GDARP)	MoAF (GDAE), Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of species reintroduced	1	3

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at ecosystem, species, genetic and ecological diversity levels)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.2.6	Providing R&D support for detailed ecological research on steppe ecosystems (population dynamics, herbivorous species-vegetation dynamics, interaction between species, etc.) and developing projects based on the subject	2021-2026	MoAF (GDNCNP, GDPP)	MoAF (GDARP), MoEU (GDPNA), TUBITAK, Relevant Universities, Relevant NGOs	Number of cooperation correspondences with Universities, NGOs, Research Institutes etc.	0	3
2.2.7	Providing R&D support to determine the effects of invasive alien species on the steppe ecosystem and steppe species and to prevent adverse effects	2021-2030	MoAF (GDARP)	MoAF (GDNCNP), Ministry of Industry and Technology, TUBITAK, Relevant Universities, Research Institutes, Relevant NGOs	Number of projects supported	0	1
2.2.8	Identifying the roads and water channels where wild animals cross intensively in the steppes and placing warning signs on the passages and establishing ecological bridges	2021-2030	MoAF (GDNCNP)	MoAF (SHW), GD of Highways, Turkish State Railways, Relevant Universities, Relevant NGOs, District Governorships	Number of ecological bridges	0	2
2.2.9	Increasing the frequency of inspections and building technical capacities to combat poaching effectively in cooperation with the local people	2021-2026	MoAF (GDNCNP)	MoAF (Dept. of Training and Publication), Presidency of Religious Affairs, Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of official reports/Year	0 /Year	50 /Year
2.2.10	Increasing the frequency of inspections to combat bio-trafficking in cooperation with the local people in regions where the concerned species are found	2021-2030	MoAF (GDNCNP, GDARP)	MoAF (Dept. of Training and Publication, GDARP), Provincial Directorates of Agriculture and Forestry, Presidency of Religious Affairs, Relevant Local Governments, Law Enforcement Officials, Relevant Universities, Relevant NGOs	Number of bio-trafficking cases	0	5

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at ecosystem, species, genetic and ecological diversity levels)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
				Objective 2.3. Conservation of the genetic resources of steppes			
				Objective Indicator: The number of steppe species that are effectively protected for genetic resources (in numbers)			
2.3.1	Identifying plant and animal species that may be important in terms of genetic resources in the steppes, determining and recording their genetic resources	2021-2030	MoAF (GDARP, GDNCNP)	MoAF (GDPP), TUBITAK, Relevant Universities, Research Institutes, Relevant NGOs	Number of research studies and projects	3	13
2.3.2	Increasing the frequency of national support programs for scientific and R&D studies for the conservation of genetic resources of ancestral species[9]	2021-2026	MoAF (GDARP), TUBITAK	Ministry of Industry and Technology, Relevant Universities, Research Institutes, Relevant NGOs, Private Sector	Increase in the number of scientific studies	0	5%
2.3.3	*Ex-situ* breeding of rare plant species with narrow distribution in steppes that are prioritized based on the threats on population and habitats, and introducing these species to nature, ensuring *ex-situ* conservation in gene banks and botanical gardens	2021-2030	MoAF (GDARP, GDPP, GDNCNP)	MoAF (GDNCNP), Relevant Local Governments, TUBITAK, Relevant Universities, Research Institutes	Number of ex-situ protected species	70	170
2.3.4	Compilation, recording and protection of traditional knowledge related to genetic resources	2021-2030	MoAF (GDARP, GDNCNP)	MoAF (GDPP, GDF), Relevant Local Governments, TUBITAK, Relevant Universities, Research Institutes, Relevant NGOs	Number of research studies	9	33
2.3.5	Reporting and publishing innovations and practices related to traditional knowledge	2021-2030	MoAF (GDARP, GDNCNP)	MoAF (GDPP, GDF), Relevant Local Governments, Relevant Universities, Research Institutes Relevant NGOs	Number of posts shared	19	69

9. The scientific cooperation protocol between TUBITAK and TAGEM will contribute to the goal of increasing the number of scientific studies (5%). In addition, R&D projects offered by the private sector on the breeding of genetically important plant and animal species can be supported by TUBITAK TEYDEB. Private sector organizations working on the subject can apply to TEYDEB support programs.

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at ecosystem, species, genetic and ecological diversity levels)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.3.6	Determining important management and production systems in terms of biodiversity, local knowledge, cultural heritage associated with steppe biodiversity as part of Globally Important Agricultural Heritage Systems (GIAHS) and pursuing the necessary application, labeling, and certification processes	2021-2030	MoAF (GDARP)	FAO, Universities, Research Institutes, Relevant NGOs	Number of sites certified	0	1
	Objective 2.4. Increasing the adaptive capacity of the steppes against climate change *Objective Indicator: The number of practices regarding adaptation to climate change (in numbers)*						
2.4.1	Modeling and evaluation studies for determining the effects of climate change on steppe ecosystems and the ecosystem services, and drafting and supporting the implementation of a monitoring action plan	2021-2030	MoAF (GDARP, GDNCNP)	MoAF (GDAR, GDPP, GDCDE, Turkish State Meteorological Service), MoEU (GDEM), TUBITAK, Relevant Universities, Research Institutes, Relevant NGOs	Number of modeling and evaluation studies	0	1
2.4.2	Recommending adaptation actions in line with the existing studies for the species, areas and ecosystem services that will be most affected by climate change and collaboratively implementing good practices	2021-2030	MoAF (GDNCNP, GDARP, GDPP, GDAR)	MoAF (GDCDE), MoEU (GDEM), Relevant Universities, Research Institutes, Relevant NGOs	Number of good practices	0	3
2.4.3	Preparation and implementation of climate change adaptation plans in line with the existing studies in protected areas (e.g., assisted migration, corridor creation, gene transfer between populations)	2021-2030	MoAF (GDNCNP)	MoEU (GDEM), Relevant Universities, Research Institutes, Relevant NGOs	Number of climate change adaptation plans	0	3

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at ecosystem, species, genetic and ecological diversity levels)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.4.4	Determining training needs in order to increase the adaptive capacity against climate change in steppe ecosystems and developing and implementing training programs in cooperation with relevant institutions	2021-2026	MoAF	MoAF (GDNCNP, GDPP, Dept. of Training and Publication, GDAR, GDARP, GDCDE, Meteorological Service), MoEU (GDEM), Relevant Universities, Research Institutes, Relevant NGOs	Number of training activities	0	1
2.4.5	Identifying and disseminating national and international good practices regarding adaptation to climate change in steppe ecosystems	2021-2030	MoAF (GDCDE)	MoAF (GDNCNP, GDPP, Dept. of Training and Publication, GDAR, GDARP), Relevant Universities, Research Institutes, Relevant NGOs	Number of good practices	2	4
Objective 2.5. Promoting the biodiversity-related value of the steppes and increasing its visibility							
Objective Indicator: Number of persons reached for the promotion and visibility of steppes (Number of persons)							
2.5.1	Sharing the results of research on steppe biodiversity	2021-2026	MoAF (GDNCNP, GDARP, GDPP)	MoAF (Dept. of Training and Publication), Relevant Universities, Research Institutes, Relevant NGOs	Number of posts shared	33	83
2.5.2	Establishment of promotional and nature education centers in priority areas to promote steppe ecosystems and species and raise awareness on the biodiversity-related value of the steppes	2021-2030	MoAF (GDNCNP, GDPP, GDARP)	Ministry of National Education, Ministry of Culture and Tourism, Relevant Local Governments, Relevant NGOs , Union of Turkish Tourist Guides Chambers (TUREB)	Number of publicity and nature education centers	7	10
2.5.3	Diversifying nature tourism and ecotourism practices for the promotion of steppes and their biodiversity (observing plant, bird, butterfly, small mammalian and large mammalian species, including tour routes for these species)	2021-2026	MoAF (GDNCNP, GDARP)	Ministry of Culture and Tourism, Relevant Local Governments, Regional Development Administrations, Development Agencies, Relevant Universities, Relevant NGOs, Association of Turkish Travel Agencies	Number of routes dedicated to the steppes	1	2

GOAL 2. CONSERVATION OF THE STEPPE BIODIVERSITY (at ecosystem, species, genetic and ecological diversity levels)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
2.5.4	Regularly carrying out awareness-raising and training activities for different interest groups (children, youth, women, opinion leaders, farmers, shepherds, imams, disabled individuals, etc.) in cooperation with relevant institutions and stakeholders on the value and biodiversity of the steppes	2021-2030	MoAF (Dept. of Training and Publication, GDNCNP, GDPP)	MoAF (GDAR, GDF, GDL, GDARP), Ministry of National Education, Presidency of Religious Affairs, Relevant Local Administrations, Regional Development Administrations, Development Agencies, Relevant Universities, Relevant NGOs	Number of training activities	10	25
2.5.5	Integrating issues related to the conservation of steppe ecosystems and the biodiversity elements into formal and non-formal education programs and materials and dissemination of primary education level steppe education sets at the national scale	2021-2030	MoAF (Dept. of Training and Publication, GDNCNP, GDPP, GDARP)	Ministry of National Education, Relevant Universities, Relevant NGOs	Number of training materials on steppes Number of areas the sets are disseminated	0 0	10 33
2.5.6	Preparation of guides on steppe plants collected and used extensively by the local people and carrying out training activities	2021-2026	MoAF (GDNCNP, GDARP)	Ministry of National Education, Presidency of Religious Affairs, Relevant Universities, Relevant NGOs	Number of guides/trainings	10	11
2.5.7	Preparing contents for the effective promotion of priority conservation species of steppes on different platforms and using them effectively in public spots, documentaries and social media	2021-2026	MoAF (Dept. of Training and Publication, GDNCNP, GDPP, GDARP)	Ministry of National Education, Presidency of Religious Affairs, Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of contents developed	5	12

GOAL 3. IMPROVING THE USE OF RESOURCES IN STEPPES WITHIN THE FRAMEWORK OF THE SUSTAINABILITY PRINCIPLE

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
	Objective 3.1. Disseminating agricultural practices supporting the steppe biodiversity						
	Objective Indicator: Changes in agricultural practices that support biodiversity (in number of farmers or area of land)						
3.1.1	Establishing a model support program for environmentally friendly agricultural practices in steppe areas (such as EFALP Program)	2021-2026	MoAF	MoAF (GDPP, GDARP, GDAR, GDNCNP), Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of environmentally friendly practices within the scope of the support	1	4
3.1.2	Carrying out necessary studies for the implementation and nation-wide dissemination of the agricultural and environmental measures program, which has been developed as a model (e.g., IPARD Agricultural-Environment Measure, Biodiversity Sub-Measure, Polatlı Great Bustard example)	2021-2026 (in GDAE) 2021-2030 (areas out of GDAE)	MoAF (GDAR, GDNCNP, GDAE)	MoAF (GDPP), Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of practices	0	2
3.1.3	Establishing and implementing agricultural incentives that support steppe biodiversity in protected areas that host steppes	2021-2026	MoAF (GDNCNP, GDPP, GDAR)	Regional Development Administrations, Development Agencies, Relevant Local Governments, Relevant Universities, Relevant NGOs, Chamber of Agricultural Engineers, Chambers of Agriculture	Number of cooperation protocols for incentives	0	1
3.1.4	Establishing technical infrastructure for supporting and disseminating no-till and direct planting practices in areas owned by local people	2021-2026	MoAF (GDPP, GDAR)	MoAF (GDNCNP), Regional Development Administrations, Development Agencies, Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of scientific studies, technical reports that support the implementation of the relevant practices	0	1
3.1.5	Reducing insecticide use and increasing the number of incentives and projects that support the conservation of biodiversity in agriculture	2021-2030	MoAF (GDFC, GDARP)	MoAF (GDAR, GDPP), Regional Development Administrations, Development Agencies, Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of biological control projects	3	8

GOAL 3. IMPROVING THE USE OF RESOURCES IN STEPPES WITHIN THE FRAMEWORK OF THE SUSTAINABILITY PRINCIPLE

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
3.1.6	Establishing and implementing incentive programs that support the reduction of insecticide and herbicide use by way of integrated pest management methods in agricultural fields around priority steppe areas	2021-2026	MoAF (GDPP, GDFC)	MoAF (GDNCNP, GDAR, ARDSI), Regional Development Administrations, Development Agencies, Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of incentive programs	1	3
3.1.7	Promoting the production and use of organic and organomineral fertilizers in priority steppe areas, reducing chemical fertilizer imports and environmental pollution, and disseminating biological and biotechnical control	2021-2026	MoAF (GDPP)	MoAF (GDFC, GDARP, GDAR), Relevant Local Governments, Relevant Universities, Relevant NGOs	Increase in the areas with biological and biotechnical control	1%	2%
3.1. 8	Expanding supports for modern irrigation techniques	2021-2030	MoAF (ARDSI, GDAR)	MoAF (GDARP), Regional Development Administrations, Development Agencies, Relevant Local Governments, Relevant Universities, Relevant NGOs	Increase in the size of application area	0	5%
3.1.9	Making an evaluation of the agricultural water needs and accordingly directing the irrigation projects to certain regions for avoidance of adverse impacts on steppe ecosystems and conservation of resources	2021-2026	MoAF (SHW)	Regional Development Administrations, Development Agencies, Relevant Local Governments, Irrigation Associations, Universities	Number of irrigation projects considered in the evaluation	3	5
3.1.10	Drafting technical reports on leaving small natural areas/habitats between fields and exclusion of rangelands during land consolidation efforts	2021-2030	MoAF (SHW, GDPP)	MoAF (GDAR, GDNCNP), Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of technical reports	0	1
3.1.11	Supporting alternative practices to reduce stubble burning and disseminating these practices throughout the country (e.g., use of milling cutters, direct planting, more severe penalties, awareness-raising etc.)	2021-2026	MoAF (ARDSI, GDAR, GDPP)	Regional Development Administrations, Development Agencies, Relevant Local Governments, Relevant Universities, Relevant NGOs, Chamber of Agricultural Engineers	Number of relevant practices	2	7

GOAL 3. IMPROVING THE USE OF RESOURCES IN STEPPES WITHIN THE FRAMEWORK OF THE SUSTAINABILITY PRINCIPLE

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
3.1.12	Implementing information and awareness-raising activities among technical personnel and farmers on agricultural practices that support biodiversity	2021-2026	MoAF (Dept. of Training and Publication, GDPP, GDAR)	MoAF (GDNCNP), Relevant Universities, Chambers of Agriculture, Universities	The proportion of training programs focused on biodiversity among the existing training programs	1%	5%
	Objective 3.2. Ensuring sustainable and ecosystem-based rangeland management						
	Objective Indicator: Changes in surface area under sustainable and ecosystem-based rangeland management (in percentages)						
3.2.1	Ensuring active participation of the service units of the Ministry of Agriculture and Forestry working on biodiversity in the stages of rangeland planning and management	2021-2026	MoAF (GDNCNP, GDPP)	Provincial Rangeland Commissions, Relevant Universities, Relevant NGOs	Number of meetings and decisions with active participation of the service units	3	8
3.2.2	Making a biodiversity inventory of rangelands by using the results of the National Biodiversity Inventory and Monitoring Project and priority species/area data and conducting additional research	2021-2026	MoAF (GDNCNP, GDPP)	Provincial Rangeland Commissions, Relevant Universities, Relevant NGOs	Number of national biodiversity inventories	1	2
3.2.3	Integrating the biodiversity data into grazing planning and management, and accordingly monitoring the implementation	2021-2026	MoAF (GDNCNP, GDPP)	Provincial Rangeland Commissions, Relevant Universities, Relevant NGOs	Number of grazing planning and management works with biodiversity elements	1	4
3.2.4	Supporting the use of local seeds and plants in rehabilitation works, integrated grazing management, seed R&D and production studies for sustainable rangeland management	2021-2030	MoAF (GDPP, GDARP, GDAE)	MoAF (GDL), Provincial Rangeland Commissions, Relevant Universities, Relevant NGOs, FAO	Number of studies	5	10%

GOAL 3. IMPROVING THE USE OF RESOURCES IN STEPPES WITHIN THE FRAMEWORK OF THE SUSTAINABILITY PRINCIPLE

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
3.2.5	Devising and promoting good practices for the use of organic compost fertilizers and soil microbiology enrichment preparations	2021-2026	MoAF (GDPP)	Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of good practices	0	2
3.2.6	Disseminating the sustainable grazing plan preparation experience, as a model acquired from the "Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project"	2021-2026	MoAF (GDPP, GDL)	MoAF (GDF, GDNCNP), Provincial Rangeland Commissions, Relevant Local Governments, Relevant Universities, Relevant NGOs, FAO	Number of Provincial Grazing Plans	1	4
3.2.7	Making protocols with universities and/ or the private sector for more effective monitoring of rangeland improvement practices (on topics such as biodiversity, biomass, amount of soil organic matter, the success of the breeding studies, the number and breeds of grazing animals, etc.)	2021-2030	MoAF (GDPP)	MoAF (GDF, GDARP, GDL), Provincial Rangeland Commissions, Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of monitoring studies in priority areas	0	3
3.2.8	Developing the infrastructure to use remote sensing and grazing planning application tracking systems for more effective monitoring of rangeland rehabilitation practices	2021-2026	MoAF (GDPP)	MoAF (GDF, GDL), MoEU (General Directorate of Land Registry and Cadastre), Provincial Rangeland Commissions, Relevant Local Governments, Relevant Universities, Relevant NGOs	The number of remote sensing and application tracking systems developed	0	1
3.2.9	Preparation of annual rangeland status reports on a provincial basis	2021-2030	MoAF (GDPP)	Provincial Rangeland Commissions, Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of studies conducted throughout the country	0	3
3.2.10	Including grazing planning in trainings for rangeland users and their families and people managing herds, putting emphasis on the importance of the steppes and the sustainable use of their resources	2021-2023	MoAF (Dept. of Training and Publication, GDPP, GDL)	MoAF (GDNCNP), Provincial Rangeland Commissions, Relevant Local Governments, Relevant Universities, Relevant NGOs	The proportion of training programs focused on rangeland use among the existing training programs	1%	5%

GOAL 3. IMPROVING THE USE OF RESOURCES IN STEPPES WITHIN THE FRAMEWORK OF THE SUSTAINABILITY PRINCIPLE

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
3.2.11	Determining the social, economic and ecological infrastructure and making necessary regulations to support the traditional livestock activities of nomads	2021-2023	MoAF (GDPP, GDL)	Provincial Rangeland Commissions, Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of regulations	0	3

GOAL 4. IMPROVING THE LIVELIHOODS OF LOCAL PEOPLE WHO BENEFIT FROM THE STEPPES

Objective 4.1. Establishing the essential environment to increase the added value of plant production and animal husbandry practices in steppes and related areas

Objective Indicator: The number of studies aimed at increasing the added value of plant production and livestock practices and their benefits to the local people (in units)

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
4.1.1	Conducting socio-economic research on human steppe interaction in priority steppe areas and conducting vulnerability and impact analysis for people benefiting from the steppe	2021-2026	MoAF (GDNCNP, GDARP, GDPP)	MoAF (GDF), Regional Development Administrations, Relevant Universities, Relevant NGOs	Number of relevant research studies	1	4
4.1.2	Performing the value chain analysis of the products obtained from the steppes	2021-2023	MoAF (GDARP, GDPP, GDL)	Regional Development Administrations, Development Agencies, Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of studies	0	3
4.1.3	Carrying out information and geographical marking studies for the protection of biodiversity-friendly production and lifestyles as well as ecological and cultural values associated with the steppes	2021-2026	MoAF (GDARP, GDPP, GDNCNP, GDAR, Directorate of Strategy Development)	Regional Development Administrations, Development Agencies, Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of products with geographical indication	100	220

GOAL 4. IMPROVING THE LIVELIHOODS OF LOCAL PEOPLE WHO BENEFIT FROM THE STEPPES

No	Actions	Timetable	Responsible Institutions	Relevant Institutions	Indicators	Current Value (unit and quantity)	Target Value (unit and quantity)
	Objective 4.2. Diversifying and supporting the income-generating activities for local people based on sustainable use of steppes *Objective Indicator: Changes in household incomes of families benefiting from supported activities and best practices (in percentages)*						
4.2.1	Evaluation of rural development opportunities in steppes where species with economic value are concentrated	2021-2026	MoAF (GDNCNP, GDPP, GDAR)	MoAF (GDARP, GDF, GDL, ARDSI), Regional Development Administrations, Development Agencies, Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of related studies	0	5
4.2.2	Carrying out activities for the production, marketing and branding of traditional handicrafts and local products in cooperation with relevant institutions and stakeholders, and supporting practices that diversify the income from rural tourism and ecotourism in steppes and their surroundings	2021-2026	MoAF (GDNCNP, GDARP)	Ministry of Culture and Tourism, Ministry of National Education, MoAF (GDPP, GDAR), Regional Development Administrations, Development Agencies, Relevant Local Governments, Relevant Universities, Relevant NGOs	Number of model practices	0	5
4.2.3	Supporting the realization and dissemination of silvopastoral and agrosilvopastoral model projects where plant production and animal husbandry practices are implemented efficiently together	2021-2026	MoAF (GDPP, GDAR, GDL)	MoAF (GDNCNP, GDARP ARDSI, GDF), Regional Development Administrations, Development Agencies, Relevant Local Governments, Relevant Universities, Relevant NGOs, FAO	Number of model practices	0	1
4.2.4	Registering and cultivating steppe species with medicinal and aromatic characteristics and supporting their production	2021-2026	MoAF (GDARP, GDPP, GDNCNP, GDAR, GDF)	Regional Development Administrations, Development Agencies, Relevant Local Governments, Relevant Universities, Relevant NGOs, FAO	The number of steppe plants registered and produced as Medicinal Aromatic Plants	10	25

6. The Governance Model

The United Nations Convention on Biological Diversity, which aims at the conservation of biodiversity, sustainable use of biological resources, and the fair and equitable sharing of the benefits arising from the utilization of genetic resources, appropriately, was signed by Turkey in 1992, and it has been ratified by Law numbered 4177, dated 29.08.1996 (The Law Regarding Approval of the Convention on Biological Diversity). The convention entered into force in Turkey on May 14, 1997.

In accordance with Article 6 of the UN Convention on Biological Diversity, the signatory countries are obliged to prepare or update the National Biodiversity Strategy and Action Plan (NBSAP). NBSAP determines the boundaries of the international commitments of the Parties (states) under the Convention in terms of reflecting the country priorities in the implementation of the decisions taken within the scope of the Convention on Biological Diversity.

National Biodiversity Strategy and Action Plan (NBSAP) was prepared in 2001 and later updated in 2007 for the period 2007-2017, in order to fulfill our obligations under the Convention, to implement applications compatible with the regulations within the European Union's nature conservation sector and to achieve conservation and sustainable use targets by addressing the biodiversity of Turkey with a comprehensive and holistic approach. National Biodiversity Action Plan (NBAP) covering the period 2018-2028 was prepared by determining new national targets and actions that are complementary to NBSAP and compatible with Aichi targets.

The 16th Conference of the Parties to the Convention on Biological Diversity will be hosted by Turkey in 2022. The National Biodiversity Coordination Board has been established under the Presidency Circular No 2019/15, under the presidency of the Minister of Agriculture and Forestry, in order to follow the developments in the global biodiversity agenda, to bring biodiversity to the economy in a sustainable way, and to effectively execute the Convention and the term presidency.

After the National Steppe Conservation Strategy and Action Plan is approved, it will need a coordination mechanism for its effective implementation, monitoring and supervision. In the workshops and meetings held in the preparatory process, it has been proposed that the main coordination of the National Steppe Conservation Strategy and Action Plan is to be undertaken by the National Biodiversity Coordination Board established by the Presidential Circular numbered 2019/15, in accordance with the experiences from governance mechanisms implemented in Turkey (Appendix 5).

According to the circular, the Board will be established with the participation of senior officials, who have authority on behalf of their respective units, from the Presidency of Strategy and Budget, Presidency of Science, Technology and Innovation Policies Board, Ministry of Agriculture and Forestry, Ministry of Environment and Urbanization, Ministry of Foreign Affairs, Ministry of Energy and Natural Resources, Ministry of Interior, Ministry of Culture and Tourism, Ministry of National Education, Ministry of Health, Industry and Technology, Ministry of Commerce, Ministry of Transportation and Infrastructure Ministry, Turkey Scientific and Technological Research Council of Turkey Chambers and Stock Exchanges Union, Foreign Economic Relations Board and the Union of Chambers of Turkish Engineers and Architects Chamber of Forest Engineers. Legislative preparation regarding the working procedures and principles of the Board continues.

The Coordination Board, which will convene at least once a year, the working procedures and principles of which will be determined by the Board, and the secretariat services and coordination of which will be carried out by the Ministry of Agriculture and Forestry, facilitates coordination in the following issues;

· Following the global biodiversity agenda,

· Ensuring that the benefits arising from the sustainable use of biodiversity are brought to the economy,

· Effectively executing the Convention on Biological Diversity and the term presidency,

· Determining the Institutions that will chair the sub-committees.

The sub-committees of the Board are:

1. International Biodiversity Policies and Projects Sub-Committee

2. Sub-Committee for the Execution of the Convention on the National Basis

3. Sub-Committee on the Management of Biodiversity

4. Sub-Committee of Sustainable Management of Biodiversity and Inclusion in Economy

5. Technology, Research, Development and Education Sub-Committee

6. Legal Sub-Committee

The "Sub-Committee for the Execution of the Convention on the National Basis", which will be established under the Board and whose duties include the implementation of the National Biodiversity Strategy and Action Plan, will be the main board responsible for this coordination. Permanent members of the sub-committee, which will meet at least twice a year, are the representatives from:

· Presidency Strategy and Budget Directorate

· Ministry of Agriculture and Forestry

· Environment and urban ministry,

· Ministry of Justice

· Ministry of Foreign Affairs

· Energy and Natural Resources Ministry

· Culture and Tourism Ministry

· Ministry of Health

· Ministry of Transport and Infrastructure

· Ministry of Education

· Ministry of Industry and Technology

· Ministry of Interior

· Turkey's Scientific and Technological Research Institution

Other institutions and organizations that are not permanent members of the agenda may also be invited to the meetings.

The duties and powers of the Sub-Committee for the Execution of the Convention on the National Basis are as follows:

1. To coordinate the determination of national biodiversity policies.

2. To ensure the coordination regarding the implementation and, when necessary, updating of the National Biodiversity Strategy and Action Plan and its annexed National Biodiversity Action Plan in order to ensure the execution of the Convention.

3. To make gap analysis regarding the execution of the Convention, to provide coordination for determining solution proposals.

4. To provide coordination regarding the periodic performance of biodiversity inventory and monitoring studies.

5. Ensuring coordination regarding determination and development of indicators related to biodiversity, ensuring compliance with international indicator sets and monitoring.

6. Ensuring coordination in combating bio-smuggling and recording traditional knowledge.

7. Ensuring coordination regarding the determination of sub-focal points and national competent authorities where the Convention needs to be executed.

8. To coordinate the establishment of the Convention clearing house mechanism.

9. To provide coordination regarding Access and Benefit Sharing.

10. Coordinating promotion and awareness activities on biodiversity.

11. Coordinating aspects of the proper integration of all databases on biodiversity.

12. Performing other duties assigned by the Board.

If deemed necessary, a Commission can be established by the Sub-Committee to ensure effective participation in decision-making processes regarding the steppes and to act as an advisory board regarding the authorities and responsibilities of the institutions. It is important that this commission takes an active role in the implementation, monitoring, and evaluation of the strategy and action plan. For the implementation of the governance mechanism, it is important to develop cooperation and ensure effective communication between relevant institutions and stakeholders. Making the necessary arrangements for the gaps in the current legal and administrative structure and establishing new legal structures and regulations are priority issues.

Secretariat Service: Secretariat service of the National Biodiversity Coordination Board is conducted by the General Directorate of Nature Conservation and National Parks. On the implementation of the National Steppe Conservation Strategy and Action Plan, the relevant General Directorates will provide technical support to the secretariat.

Reporting: In order to strengthen the coordination and cooperation between the governmental organizations and stakeholders for the effective implementation, monitoring and assessment of the National Steppe Conservation Strategy and Action Plan, the necessary information about the process will be obtained with the official correspondences at the end of each year and will be submitted as a report to the Sub-Committee for the Execution of the Convention on the National Basis.

Figure 37. Proposed structure for the coordination of the National Steppe Conservation Strategy and Action Plan

Gazella marica
(Arabian sand gazelle)

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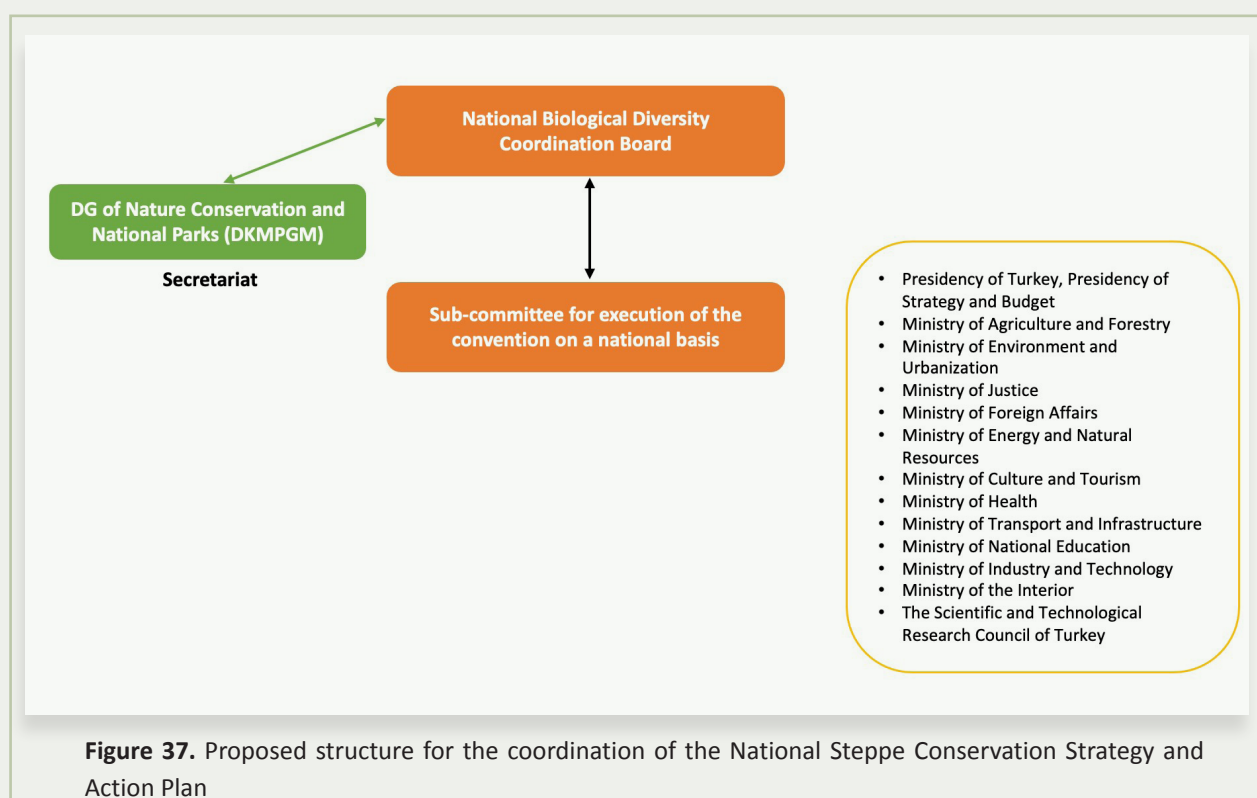
7. The Monitoring System

Results of the monitoring and evaluation activities under the National Steppe Conservation Strategy and Action Plan will be reported to the Sub-Committee for the Execution of the Convention on the National Basis. Since the secretarial services of the National Biodiversity Coordination Board, to which the committee is affiliated, is conducted by the General Directorate of Nature Conservation and National Parks, the main reporting task will rest with this institution.

The monitoring system will be one of the most important management tools for the National Steppe Conservation Strategy and Action Plan. This system is defined as a systematic process to track changes in line with the goals and objectives of the National Steppe Conservation Strategy and Action Plan.

Monitoring and evaluation of the National Steppe Conservation Strategy and Action Plan, and contributing to the monitoring efforts made by various institutions and organizations in Turkey will be instrumental in enhancement of interagency collaboration and development of solutions for the implementation-related problems by the Sub-Committee for the Execution of the Convention on the National Basis.

In line with the goals and objectives of the National Steppe Conservation Strategy and Action Plan, monitoring is recommended in the following areas:

1. Progress in the implementation of the National Steppe Conservation Strategy and Action Plan,

2. Monitoring efforts in the priority steppe areas and species and monitoring of changes in the condition of species and their habitats,

3. Changes in the condition of rangelands,

4. Changes in the severity of threats to the priority steppe areas and species,

5. Effects of climate change on steppe ecosystems,

6. Success of conservation and sustainable management practices (monitoring the effects of conservation activities, habitat restoration efforts, management effectiveness of the protected areas, success of rangeland management practices, conversion of agricultural fields, success of environmentally-friendly /nature-friendly/ climate-smart/ organic/ holistic agricultural practices, etc.).

The current status and results of the monitoring studies will be presented at the meetings of the Sub-Committee for the Execution of the Convention on the National Basis once a year.

If necessary, changes will be proposed to the National Steppe Conservation Strategy and Action Plan according to the monitoring results, and consultations will be made with the relevant stakeholders to increase the effectiveness of the implementation.

One of the most important outputs of the monitoring system will be the annual reporting and sharing of the activities of the National Steppe Conservation Strategy and Action Plan Coordination Board. With this reporting, the progress, success and problems in implementation and lessons learned will be regularly noted.

Proposed Monitoring and Evaluation Plan:

Monitoring Subject	Evaluation	Method	Responsible Institution	Reporting Period
Monitoring progress in the implementation of the National Steppe Conservation Strategy and Action Plan	Progress Report of the National Steppe Conservation Strategy and Action Plan	Interviews and evaluations made by the group of independent experts	General Directorate of Nature Conservation and National Parks (Secretariat)	Annual
Monitoring priority steppe habitats, species, threats to them, and conservation efforts for them	Monitoring Report for Priority Steppe Habitats and Species	Field work	General Directorate of Nature Conservation and National Parks	Every 2 years
Monitoring the management effectiveness of the protected steppe areas	National Protected Areas Management Effectiveness Assessment Report	METT assessment by GDNCNP	General Directorate of Nature Conservation and National Parks	Every 3 years
Monitoring the status of and management practices for rangelands across the country	National Rangeland Status Report	Satellite image analysis and field work	General Directorate of Plant Production	Every 2 years
Monitoring the changes in agricultural fields and good practices in agriculture and animal husbandry throughout the country	National Agriculture and Livestock Status Report	National farmer registry, satellite image analysis and field work	General Directorate of Plant Production	Every 3 years
Monitoring the effects of climate change on steppe ecosystems	Report on the effects of climate change on the steppe ecosystems	Modeling, field work	GDARP	Every 5 years

All reports to be prepared as a result of the monitoring studies will be evaluated in the meetings of the Sub-Committee for the Execution of the Convention on the National Basis, and decisions taken for effective management will be implemented by the relevant institutions.

8. Steppe Terminology

1. **Alien Species:** Species intentionally or unintentionally carried by humans to a place, area, or region where it does not naturally occur.

2. **Anatolian Steppes:** Mostly anthropogenic steppes where xerophytic herbaceous plants are predominant in Central Anatolia, Eastern Anatolia and Southeastern Anatolia Regions with low rainfall, arid and semi-arid climate.

3. **Anthropogenic Steppe:** Steppes that are formed by destruction of forest cover as a result of human activities such as overgrazing, clearing for agriculture, fuel supply, etc.

4. **Climate Change:** In addition to natural climate changes observed over comparable time periods, changes in the climate as a result of human activities that directly or indirectly disrupt the composition of the global atmosphere.

5. **Climate Variability:** Deviation of a climate variable from its long-term average values in a region.

6. **Climax:** The steady-state reached by a community as the final phase of succession.

7. **Desertification:** "Land Degradation" that occurs as a result of various factors including climate change and human activities in arid and semi-arid areas.

   Characteristic species of the vegetation decrease or disappear, overall vegetation cover decreases significantly, the amount of bare soil increases, grass becomes shorter, and dwarf shrubs, also seen in semi-deserts, become predominant.

8. **Drought:** The event in which the biomass productivity of the land is negatively affected because of insufficient absorption of atmospheric moisture (rain, snow, dew, etc.) by the soil and excessive evaporation, resulting from improper land management and/or significant hydrological imbalances when the rainfall is below average for years and/or is irregular.

9. **Ecosystem:** A dynamic system in which plant, animal and microorganism communities and their non-living environments interact as a functional unit.

10. **Erosion:** The process in which the soil clusters (aggregates) are disintegrated and transported by factors such as water, wind and gravity; consequently accumulating in environments different from where they were once located.

11. **Forage Plants:** Plants that are cultivated as animal feed or grow naturally and usually contributes to the conservation of soil and water and to increased the yield of the crops that come after them in the crop rotation. They are harvested and dried or put in silages to be fed immediately or later.

12. **Governance:** Basically, the processes and structures that enable society to share power and transform it into individual and social activities. It refers to participatory decision-making and management processes based on cooperation, where different actors apart from governmental institutions take responsibility.

13. **Grass (Poaceae - Gramineae) Steppes:** Steppes dominated by the species of the grass family.

14. **Grassland Vegetation:** Type of vegetation that is distributed in the temperate zone, where the amount of rainfall and/or groundwater is higher than in steppes; tall grasses are dominant with a few woody plants.

    In terms of agricultural production and use, humid areas with tall grasses harvested to be used as animal feed are characterized as mown grasslands. In terms of vegetation, herbaceous vegetation in the areas

surrounding the wetlands and the vegetation that grows in the humid areas above the tree border are considered grasslands.

15. **Grazing:** Letting livestock feed by dispersing in rangelands, highlands, and meadows.

16. **Gypsum Steppe:** Steppes that occur on soils with high gypsum content, with a high rate of endemism.

    Major gypsum steppes in Turkey are situated in the region between Nallıhan-Beypazarı-Ayaş-Polatlı-Sivrihisar, the region between Kayseri and Sivas (especially around Akkışla), and the region between Narman and Tortum, Hafik-Zara and Çankırı.

17. **High Mountain Steppe:** Steppes dominated by thorny plants such as milkvetches (*Astragalus*), and prickly thrifts (*Acantholimon*), which are generally situated between 1,600 to 3,000 m of altitude.

    In Turkey, they are seen in the Eastern Taurus Mountains and higher parts of the mountains in Central Anatolia and Eastern Anatolia Regions.

18. **Invasive Alien Species:** Species of plants, animals, fungi, and microorganisms that accidentally or deliberately enter or are released into a natural environment, which is not their habitat under normal conditions, and reproduce, develop, spread in these environments, causing many adverse effects in the new environment.

19. **Low Mountain Steppe:** The most common steppe type in Turkey located on the mountain slopes between 800-1600 m, which generally host soft-leaved plants (malacophyll) and have a floristically rich composition.

    It is seen in the Central, Eastern, and Southeastern Anatolia regions in Turkey.

20. **Lowland Steppe:** Steppes found on flat or slightly sloped arid lands in Turkey, which are usually dominated by *Artemisia* species.

    They are seen in the lowland plains of Central Anatolia and Southeastern Anatolia Regions. Most of the areas that were once lowland steppes in the past have lost this character and have been transformed into agricultural production areas.

21. **Malacophyll Steppe:** Steppes dominated by herbaceous plants with broad and soft leaves.

    The main formations of the low mountain steppe, malacophyll steppes are common in Turkey.

22. **Marly Steppe:** Steppes with a high rate of endemism, seen in calcareous white soils with a high rate of clay.

    Ayaş, Beypazarı, Polatlı, Sivrihisar, Yunus Emre, Mihalıççık, Hafik, Zara, Çankırı and Kırşehir are the regions where marly steppes are seen.

23. **Natural Steppe:** Steppes located in regions where ecological conditions such as climate, soil and geomorphological features do not allow tree growth and natural forests.

24. **Overgrazing:** Intensive grazing for long periods of time without allowing the natural vegetation to recover, causing deterioration of the vegetation and decrease of plant diversity.

25. **Pasture:** See Rangeland.

26. **Rangeland:** An area that has been allocated for grazing of livestock and producing forage plants or has been used for this purpose for hundreds of years.

    While steppe is a type of vegetation, rangeland is a form of land use.

27. **Rangeland Dependent Livestock:** A form of animal husbandry in which it is essential to feed animals outdoors on plants that grow naturally on rangelands, and with additional feeding in certain periods.

28. **Salt-tolerant (Halophytic) Steppe:** Steppes formed by salt-tolerant plants (halophytes), which grow on salty soils, dominated by species belonging to the Amaranth (Amaranthaceae) and Leadworts (Plumbaginaceae) families.

In Turkey, they are seen around the salt lakes and salt marshes in Lake Tuz, Seyfe, Burdur, Konya plain, Acıgöl, Develi closed basin, along Aras Valley from Kağızman to Iğdır-Aralık, on salty areas between Kırıkkale-Balışeyh, Çorum-Sungurlu, Yozgat-Yerköy, around Çankırı, and around Balıkdamı and Kavuncu lakes in Eskişehir, around Kayseri Tuzla Lake and Nallıhan-Davutoğlan.

29. Semi-Arid Climate (Semi-Desert Climate): Climate type that is characterized by an average rainfall of between 250 and 500mm.

30. Serpentine Steppe: Steppes with serpentine (ultramafic rocks) soil rich in heavy metals such as magnesium, iron, nickel, chromium, which have poor vegetation and a high endemism rate since this soil is not suitable for plant growth.

In Turkey, serpentine steppes are found around Kütahya, Balıkesir, between Adana - Erzincan, Gölbaşı-Ankara-Kırıkkale and Doğanşehir and in Muğla, Antalya, Mersin and Hatay along the Taurus Mountains.

31. Steppe: A type of vegetation distributed in the temperate zone receiving an average annual rainfall of 300-500 mm that has low groundwater and is dominated by xerophytic herbaceous plants with less woody plant cover.

They are seen in the interior parts of North America, southeast of South America, south of Africa, extending from China to Eastern Europe in Asia. While the term "steppe" is generally used in the Palearctic Region, different names can be used in the above-mentioned regions to refer to the same (pampas in South America, prairie in North America, veld in South Africa).

32. Steppe Climate: Climate seen in the interior parts of the continents where summer months are hot, arid and semi-arid, and winter months are cold, the temperature difference between the seasons is high and rainfall is low.

33. Steppe Culture: A lifestyle that emerged as a result of adaptation of human culture to steppe ecosystems.

34. Steppe Ecosystem: A dynamic system in which the plant, animal and microorganism communities specific to steppes and their non-living environments interact as a functional unit.

35. Steppe Forest: Forest areas located in ecological regions dominated by steppes.

The difference from steppes with trees is that these areas are mostly in the transitional regions from forest to steppe.

36. Steppe Species: Species that are adapted to steppe conditions whose existence depends on steppes.

37. Steppe Vegetation: Vegetation adapted to steppe conditions.

38. Steppes with Trees: Steppes with tree and shrub cover below 40%.

Different names may be given by different specialties for the same field or formation, for example; the place we call steppes with trees can be named as "Degraded Forest", "Forest with Openings" in terms of forestry or "Sparse Forest" in terms of ecology. However, in this study, the terms used with regard to steppes are duly explained.

39. Succession: The change in the structure, composition, processes, relationships, and other characteristics of a community or ecosystem over time.

40. Successional Change: See Succession

41. Thorn-cushion (Tragacanthic) Steppe: Steppes dominated by thorny cushion forming plants, such as milkvetch (*Astragalus*), and prickly thrift (*Acantholimon*).

42. Transhumance: A semi-nomadic rural lifestyle people generally lead on high mountain plateaus far from the village because of the nutritional needs of their livestock in summer months.

9. Glossary

Adaptation to climate change	The process of developing, strengthening and implementing strategies to combat the effects of climate events (risks), gain benefits and manage effects.
Biodiversity	"The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems." (CBD, 1992)
Biogeography	The discipline that studies the geographical distribution of organisms and the geographical factors that affect that distribution.
Biological control	The struggle to keep the harm below a level that causes economic damage by using other living organisms against pests, diseases and weeds in the plant.
Biological resources	Biological resources include genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity (CBD).
Climate-smart agriculture	An approach that helps to guide actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate. It aims the following: sustainably increasing agricultural productivity and income, adapting to and building resilience against climate change, and reducing and/or eliminating greenhouse gas emissions, where possible (FAO).
Crop rotation	The practice of growing a series of different species of crops in succession in a certain order on the same land. This improves soil quality, increases soil productivity, and reduces threat of plant diseases and erosion.
Desertification/ land degradation	The land degradation in arid, semi-arid and sub-humid areas resulting from various factors, including climatic variations and human activities. Decline in the biological and economic productive capacity of agricultural fields, rangelands and forests or the complete disappearance of productivity in these areas, resulting in processes such as land degradation, soil erosion caused by the effects of wind and/or water in arid, semi-arid and sub-humid areas, loss of soil in physical, chemical, biological or economic terms, and loss of vegetation on the soil and resulting from land use processes (UNCCD).
Direct seeding	The method that allows planting at once without tillage before planting. In no-tillage farming, unlike traditional practices, no tillage is carried out until re-seeding after harvest and the seeding is carried out with special drills that can plant on the area covered with stubble from the previous crops. This method increases productivity and profitability, contributes to food security and is also climate and environmentally friendly.
Drought (Aridity)	A naturally occurring phenomenon that exists when precipitation has been significantly below normal recorded levels, causing serious hydrological imbalances that adversely affect land resource production systems. It is divided into meteorological drought and agricultural drought (UNCCD).
Environmentally -friendly agriculture	Practices and applications that protect soil and water resources and their quality, support biodiversity, reduce environmental impacts from pesticides, pollution, soil erosion and greenhouse gas emissions. The aims are sustainable agricultural productivity and increased income, building adaptation to and resilience against climate change, and if possible, reducing and/or eliminating greenhouse gas emissions.
Ecological corridor	Natural or artificially designated connection areas that allow movement of species by ecologically connecting habitats in geographic regions close to each other.

Ecological zone	Large terrestrial or aquatic areas that are ecologically and geographically defined, unique in terms of their environmental conditions and species they host.
Ecosystem	A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit (CBD 1992).
Ecosystem-based adaptation	The use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people adapt to the adverse effects of climate change (CBD 2009).
Ecosystem-based management	An approach to maintaining or restoring the composition, structure, functioning, and delivery of services of natural and altered ecosystems for the goal of achieving sustainability. It is based on an adaptive, collaboratively developed vision of desired future conditions that integrates ecological, socioeconomic, and institutional perspectives, applied within a geographic framework, and defined primarily by natural ecological boundaries (MEA 2005). https://www.biodiversitya-z.org/content/ecosystem-based-management
Ecosystem services	Benefits people obtain from ecosystems. These include provisioning services such as food and water, regulating services such as regulation of floods, drought, land degradation, and disease, supporting services such as soil formation and nutrient cycling, and cultural services such as recreational, spiritual, religious and other non-material benefits (MEA 2005). By IPBES (2019), "Nature's Contributions to People" has been started to be used instead of "Ecosystem Services", which allows for an understanding of the relationship and interaction between people and nature from a more comprehensive perspective. https://www.biodiversitya-z.org/content/ecosystem-services
Endemic	Originates from the Greek word "endomos" and means "native, restricted to a certain place". Plant or animal species found only in a certain geographical area.
***Ex-situ* conservation (Off-site conservation)**	The conservation of components of biodiversity outside their natural habitats (CBD 1992).
Food security	Food security refers to all individuals' ability to access adequate, safe and nutritious food in physical, social and economic terms to meet the nutritional needs and food preferences required for an active and healthy life at all times. Food security is generally defined with 4 main components: availability, accessibility, utilization, and stability.
Gender equality	Regardless of their gender, individuals enjoying equal rights and opportunities and equal treatment and developing personal knowledge and skills and making choices in all areas they want. Equality is achieved when gender inequalities are eliminated, equal social values, equal rights and equal responsibilities are attached to each individual regardless of their gender, and individuals have equal access to resources (opportunities) to enjoy the abovementioned.
Genetic resources	Genetic material of actual or potential value (Any material of plant, animal, microbial or other origin containing functional units of heredity) (CBD 1992).
Geophyte	"Geophyte" is a combination of the Latin words "geo" and "phyta" meaning plant, and means "underground plants, hidden plants". The storage organs of these plants are metamorphosed in the form of bulbs, tubers, corms or rhizomes and are underground. Geophytes, which are generally ornamental plants, are also called "flower bulb".
Grazing plan	Implementation plan specifying details such as grazing season, stocking capacity, grazing system, breed and number of livestock, start and end dates of grazing for regular grazing in the rangelands, summer pastures, winter pastures and public meadows and grasslands (definition in the legislation).
Habitat	Place or environment where an organism or population naturally occurs (CBD 1992).

Halophyte	A salt-tolerant plant that grows in soil or waters of high salinity, salt marshes, and places where salt water is transported with the effect of the wind.
Holistic grazing management / Holistic planned grazing	A flexible and proactive grazing planning method that provides the opportunity to include ecological restoration and socio-economic gains in the planning process, prevents overgrazing by giving the plants recovery time to adapt to the season, generally creates a strong hoof effect with high herd density, and can be applied at all scales and in all climates. It was developed by the Zimbabwean biologist Allan Savory (Savory Institute), inspired also by grazing under predator pressure of wild herds and their continuous motion patterns.
***In-situ* conservation (On-site conservation)**	The conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties (CBD 1992).
Integrated pest management (integrated pest control)	Pest management system to keep pest populations below a level that causes economic damage, by taking into account their population dynamics in cultivated plants and their relations with the environment, using appropriate control methods and techniques (definition in the legislation).
Land consolidation	Preventing land degradation and fragmentation with natural and artificial effects, establishing more functional new parcels economically, ecologically and socially by combining multiple parcels taking into account natural features, integrity of use and property rights in fragmented lands and determining the forms of utilization of these parcels by evaluating the land characteristics and area, providing village and land development services (definition in the legislation).
Land degradation neutrality (LDN)	A state whereby the amount of healthy and productive land resources necessary to support the ecosystem functions and services remains stable or increases within the specified temporal and spatial scales (UNCCD).
Marginal agricultural land	Areas with low soil productivity, low accessibility, fragility and heterogeneity. Lands on which only traditional tillage agriculture is carried out due to soil and topographic limitations.
Medicinal and aromatic plant	All plants and plant parts mainly used in cosmetic and pharmaceutical industries. They are used in fresh, dried, cut, uncut, crushed, powdered or other forms.
No-till farming	The practice of seeding or planting directly into a field (agriculture or pasture) with no tilling performed after harvesting the previous crops.
Phytogeography	The branch of biogeography, the discipline that studies the geographical distribution of plant communities and plant ecology.
Rangeland rehabilitation	Taking and implementing various physical and technical measures aimed at facilitating grazing, soil and water conservation as well as irrigation, fertilization, weeding, seeding and similar biological techniques to enhance rangelands, summer pastures and winter pastures and public meadows and grasslands in terms of feed efficiency and quality (definition in the legislation).
Rangeland management	A rangeland planning and management style based on scientific data, without damaging the vegetation, soil, water and other natural resources in order to benefit from rangelands, summer pastures, winter pastures and public meadows and grasslands in the most proper way.
Restorative rangeland management	The set of practices and planning processes that enable meadows, grasslands and steppe ecosystems to reach more resilient, productive and higher biodiversity than before through the use of holistic grazing management (holistic planned grazing) in addition to their grazing planning. Beyond sustainability, this establishes positive feedback "win-win" processes, with economic gain and ecological restoration taking place together.

Rehabilitation	Measures taken to rehabilitate degraded ecosystems or habitats following exposure to impacts that cannot be completely avoided and/ or minimized. Rehabilitation emphasizes the reparation of ecosystem processes, productivity and services, whereas the goals of restoration also include the re-establishment of the pre-existing biotic integrity in terms of species composition and community structure. https://www.biodiversitya-z.org/content/rehabilitation
Restoration	The returning process of an ecosystem or habitat that has been degraded, damaged, or destroyed, to its original coexistence structure, the natural integrity of the species and their natural functions. https://www.biodiversitya-z.org/content/restoration
Rotational grazing	Grazing the animals on certain parcels of rangelands and grasslands for certain periods according to the calculated carrying capacity. This allows the animals to be grazed in certain parts of the rangelands at certain periods, while the other parts are left to rest and improve until it is their grazing turn.
Silvopastoral	The management system where trees and grass and grazing lands are located together on the same land and that envisages benefits from both resources together. The trees provide shade and protection for animals as well as wood while the grazing lands provide more animal yield and income than treeless areas of similar kind. In silvopastoral areas, usually ovine animals (sheep, goats) are grazed. Silvopastoral systems also contribute to wildlife development, water quality, soil productivity, and conservation of soil from water and wind erosion.
Steppe forest	Areas forming sparse or closed forests in ecological regions dominated by steppes.
Stubble burning	Burning the roots and straws that remain in the field after harvest. This causes loss in humus and moisture in soil and acceleration of erosion.
Sustainable land management	The use of land resources, including soil, water, animals and plants, for provision of products to meet the changing needs of people, and to ensure the long-term conservation of the productive potential of these resources and the continuity of their environmental functions. Sustainable land management aims to increase the economic and social well-being of the affected communities, maintain the services provided by the ecosystem, and strengthen the adaptive capacity to manage climate change.
Sustainable use	The use of components of biodiversity in a way and at a rate that does not lead to the long-term decline of biodiversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations (CBD 1992).
Systematic Conservation Planning	Systematic Conservation Planning (SCP) is the process of establishing a conservation management system with clearly defined conservation objectives that the entire biodiversity is represented in a permanent (long-term) manner and not limited to protected areas. A conservation system is planned at regional and/or national scales by using biological and socio-economic data together.
Xerophyte	A drought-resistant desert plant that grows in arid environments. These plants grow in deserts and alkaline, acid, salty and dry soils.

References:

https://www.biodiversitya-z.org/

https://www.tarimorman.gov.tr/CEM/Belgeler/collesme%20belgeleri%20arsiv/Sayfa02/CollesmeSozluk.pdf

10. References

Akman, Y. 1974. Evolution régressive de la végétation a étage du Pinus nigra subsp. pallasiana dans l'Anatolie Centrale dans un climat méditerranéen semi aride trés froid. Communications Faculty of Sciences University of Ankara, C2 18(1): 1-6.

Akman, A., Ketenoğlu, O., Quézel, P. 1985. A new syntaxon from Central Anatolia. Ecologia Mediterranea 11(2-3): 111-121.

Altın, M. 2006. Mera Yönetimi ve Islahı Konusunda Mera Komisyonu Görüşü. Tarım ve Köyişleri Bakanlığı Tarımsal Üretim ve Geliştirme Genel Müdürlüğü Raporu, Ankara.

Altın, M., Gökkuş, A., Koç, A. 2011. Çayır ve Mera Yönetimi. 1. Cilt (Genel İlkeler). Tarım ve Köyişleri Bakanlığı, Tarımsal Üretim ve Geliştirme Genel Müdürlüğü, Ankara, 376 pages.

Ambarlı, D., Zeydanlı, U.S., Balkız, Ö., Aslan, S., Karaçetin, E., Sözen, M., Ilgaz, Ç., Gürsoy Ergen, A., Lise, Y., Demirbaş Çağlayan, S., Welch, H.J., Welch, G., Turak, A.S., Bilgin, C.C., Özkil, A., Vural, M. 2016. An overview of biodiversity and conservation status of steppes of the Anatolian Biogeographical Region. Biodiversity and Conservation 25 (12): 2491-2519.

Ambarlı, D., Turak, A.S., Kınıkoğlu, Y., Akkök İ., Ertürk, A., Zeydanlı, U., Bilgin, C.C. 2010. Anadolu Çaprazı Sistematik Koruma Planlaması Projesi (Unpublished report), Doğa Koruma Merkezi, Ankara.

Avcıoğlu-Çokçalışkan, B., Acar, R., Aksoy, E., Aktuz, N.C., Bauer, F., Bushi, E., Camilli, B., Çil, A., Dudu, D., Keskin, S., Malkoç, E. Martin, J., Maruniak, E., Mencet-Yelboğa, M.N., Moody, R.S., Semenova, T., Sharp, N., Siposs, V., Tekin, E., Türker, S. N., Öztürk, Y. Bozdemir, F. 2018. Ecosystem Based Adaptation Strategy For Anatolian Steppe Ecosystems. Agricultural Implications for Ecosystem Based Adaptation (EBA) to Climate Change in Steppe Ecosystems, DOGER/AIEBA/TR2012/0740.14-2/GRA/024, GCP/TUR/063-EC, Food and Agriculture Organization of the United National Subregional Office for Central Asia (FAO-SEC), Ankara.

Ayan, İ. Acar, Z. Mut, H. Can, M Kaymak, G Tunalı, U. 2020. Çayır ve Mera Alanlarında Mevcut durum Sürdürülebilirlik ve Gelecek. Türkiye Ziraat Mühendisliği 9. Teknik Kongresi Bildiri Kitabı, Ankara.

Ahiler Kalkınma Ajansı. 2013. TR71 Bölgesi (Aksaray, Kırıkkale, Kırşehir, Nevşehir ve Niğde) Bölge Planı, 2014-2023. Nevşehir.

Ankara Kalkınma Ajansı. 2015. TR71 Düzey 2 ve 3 Bölgesi (Ankara) Bölge Planı, 2014-2023. Ankara.

Başbakanlık Devlet Planlama Teşkilatı. 2007. Dokuzuncu Kalkınma Planı (2007-2013). Ankara.

Baytaş, A. 2019. Türkiye'nin Kelebekleri Arazi Rehberi. Doğa Koruma Merkezi. Ankara, 263 pages.

Birand, H. 1968. Alıç Ağacı ile Sohbetler: Olgun Kardeşler Mat.

Birand, H. 1961. Erste Ergebnisse vegetations-Untersuchungen in der Zentral Anatolischen steppe I. Halophyten gesellschaffen des Tuzgolii. Botanische Jahrbücher fur Systematik, Pflanzengeschichte und Pflanzengeographie 79 (3): 255–296.

Borrelli, P., Robinson, D.A., Fleischer, L.R., Lugato, E., Ballabio, C., Alewell, C., Meusburger, K., Modugno, S., Schutt, B. Ferro, V. Bagarello, V. Van Oost, K., Montanarella, L., Panagos P. 2017. An assessment of the global impact of 21st century land use change on soil erosion. Nature Communications 8(1): 1-13.

Bottema, S., Woldring, H. Aytug, B. 1993. Late Quaternary vegetation history and climate in northern Turkey. Palaeohistoria 35/36: 13-72.

CBD. 2019. Strategic Plan For Biodiversity 2011-2020, Including Aichi Biodiversity Targets. Accessed on: 15 March 2020. https://www.cbd.int/sp/

CORINE. 2018. CORINE Land Cover. European Commission Copernicus Service. Accessed on: 15 January 2020 [https://land.copernicus.eu/pan-european/corine-land-cover]

ÇEM. 2017. Türkiye Çölleşme Modeli, Teknik Özet. Çölleşme ve Erozyonla Mücadele Genel Müdürlüğü, Ankara.

Çetik, R., Vural, M. 1979. Ecological and sociological studies on the vegetation of Afyon, Bayat-Köroğlubeli and its environment.

Çevre ve Orman Bakanlığı. 2011. Rio Sözleşmeleri Kapsamında Türkiye'nin Ulusal Kapasitesinin Değerlendirilmesi Projesi Ulusal Kapasite Eylem Planı. Ankara.

Çevre ve Orman Bakanlığı, 2007.Ulusal Biyolojik Çeşitlilik Stratejisi ve Eylem Planı. Ankara.

Çevre ve Şehircilik Bakanlığı. 2011a. Türkiye Cumhuriyeti İklim Değişikliği Eylem Planı, 2011-2023. Ankara.

Çevre ve Şehircilik Bakanlığı. 2011b. Türkiye İklim Değişikliği Stratejisi, 2010-2023. Ankara.

Çevre ve Şehircilik Bakanlığı. 2011c. Türkiye'nin İklim Değişikliği Uyum Stratejisi ve Eylem Planı, 2011-2023. Ankara.

Çolak, A.H., Rotherham, I.D. 2006. A review of the forest vegetation of Turkey: its status past and present and its future conservation. In: Biology and Environment: Proceedings of the Royal Irish Academy (s. 343-354). Royal Irish Academy.

Dettenmaier, S.J., Messmer, T.A., Hovick, T.J., Dahlgren, D.K. 2017. Effects of livestock grazing on rangeland biodiversity: A meta-analysis of grouse populations. Ecology and evolution 7(19): 7620-7627.

di Gregorio, A. 2005 Land Cover Classification System Classification Concepts and User Manual Food and Agriculture Organization of the United Nations, Rome, http://www.fao.org/docrep/008/y7220e/y7220e02.htm

Dicle Kalkınma Ajansı. 2013. TRC3 Bölgesi (Batman, Mardin, Siirt, Şırnak) Bölge Planı, 2014-2023. Mardin.

Doğa Koruma Merkezi. 2018. Bozkır Ekosistemlerinde İklim Değişikliğine Ekosistem Tabanlı Uyum (ETU) için Tarım Uygulamaları Projesi GCP/TUR7063/EC, Mevzuata İlişkin Rapor. Ankara.

Doğu Anadolu Kalkınma Ajansı. 2013. TRB2 Bölgesi (Bitlis, Hakkâri, Muş, Van) Bölge Planı, 2014-2023. Van.

Dufour-Dror, J., Ertas, A. 2004 Bioclimatic perspectives in the distribution of Quercus ithaburensis Decne subspecies in Turkey and in the Levant. Journal of Biogeography 31:461–474.

Eken, G., Bozdoğan, M., İsfendiyaroğlu, S., Kılıç, D. T., Lise, Y. (editors) 2006. Türkiye'nin Önemli Doğa Alanları. Doğa Derneği. Ankara.

Ekim, T., Kart Gür, M. (editors) 2019. Alıç Ağacının Gölgesinde Anadolu Bozkırları. Türkiye İş Bankası Kültür Yayınları, İstanbul.

Emberger, L. 1955. Une classification biogéographique des climats.

European Environment Agency. 2015. Biogeographical regions. http://www.eea.europa.eu/data-and-maps/

Fırat Kalkınma Ajansı. 2013. TRB1 Bölgesi (Malatya, Elazığ, Bingöl ve Tunceli) Bölge Planı, 2014-2023. Malatya.

Gıda, Tarım ve Hayvancılık Bakanlığı. 2018. Türkiye Tarımsal Kuraklıkla Mücadele Stratejisi ve Eylem Planı, 2018-2022. Ankara.

Gıda, Tarım ve Hayvancılık Bakanlığı. 2015. Ulusal Kırsal Kalkınma Stratejisi, 2014-2020. Ankara.

Gökkuş, A. 2018. Meralarımız ile ilgili bir değerlendirme. TURKTOB Dergisi 25: 6-8.

Grossman, D.H., Faber-Langendoen, D., Weakley, A.S., Anderson, M., Bourgeron, P., Crawford, R., Pyne, M. 1998. International classification of ecological communities: terrestrial vegetation of the United States. The Nature Conservancy, Arlington, Virginia.

Harlan, J.R. 1995. The Living Fields: Our Agricultural Heritage. Cambridge University Press. Cambridge.

Harlan, J.R. 1971. Agricultural origins: centers and noncenters. Science 174 (4008): 468-474.

Hamzaoğlu, E. 2006. Phytosociological studies on the steppe communities of East Anatolia. Ekoloji 15(61): 29-55.

İpekyolu Kalkınma Ajansı. 2015. TRC1 Bölgesi (Gaziantep, Adıyaman, Kilis) Bölge Planı, 2014-2023. Gaziantep.

Kalkınma Bakanlığı. 2012. Onuncu Kalkınma Planı, Sürdürülebilir Orman Yönetimi Özel İhtisas Komisyonu Raporu. Ankara.

Karacadağ Kalkınma Ajansı. 2013. TRC2 Bölgesi (Diyarbakır- Şanlıurfa) Bölge Planı, 2014-2023. Şanlıurfa.

Kart Gür, M., Gür, H. 2018. Anadolu yer sincabının (Spermophilus xanthoprymnus) üreme ve hibernasyon fenolojileri. Bilim ve Ütopya 292: 13-16.

Karaçetin, E., Welch, H.J., Turak, A., Balkız, Ö., Welch, G. 2011. Türkiye'deki Kelebeklerin Koruma Stratejisi. Ankara: Doğa Koruma Merkezi. Access: [www.dkm.org.tr]

Kendir, H. 2017. Çayır ve Meraların Üretime Katkısını Arttırma Olanakları. Tarım Haftası 2017 Türkiye'de Hayvansal Üretimi Arttırma Simpozyumu Bildiri Kitabı.

Ketenoğlu, O., Vural, M., Kurt, L., Körüklü, T. 2014. Vejetasyon. In: Güner, A., Ekim, T. (editors). Resimli Türkiye Florası, Cilt 1. Ali Nihat Gökyiğit Vakfı, Flora Araştırmaları Derneği ve Türkiye İş Bankası Kültür Yayınları, İstanbul.

Kılınç, M. 1976. Tarihi Devirler boyunca Anadolu Vejetasyonunun tahribinde insanın rolü. Bitki 3(3): 299-307.

Koç, A., Gökkuş, A., Serin, Y. 1994. Türkiye'de Çayır-Meraların durumu ve erozyon yönünden önemi. Ekoloji Çevre Dergisi 13: 36-41.

Kosswig, C. 1955. Zoogeography of the Near East. Systematic Biology 4(2): 49–73.

Kurt L., Ketenoğlu, A.O., Vural, M., Körüklü, T. 2014. Bölüm: Vejetasyon. In: Ekim, T., Güner, A. (editors) Resimli Türkiye Florası. Cilt:1. Türkiye İş Bankası Yayınları.

Kuzeydoğu Anadolu Kalkınma Ajansı. 2014. TRA1 Bölgesi (Erzurum, Erzincan, Bayburt) Bölge Planı, 2014-2023. Erzurum.

Ladizinsky, G. 1998. Plant Evolution under Domestication. Kluwer Academic Publishers. the Netherlands.

Louis, H. 1939. Das naturliche Pflanzenkleid Anatoliens. Geographische Abhandlungen no. 12. Stuttgart.

Mayer, H., Aksoy, H. 1986. Walder der Turkei. Stuttgart. Gustav F.V.

Mevlana Kalkınma Ajansı. 2014. TR52 Bölgesi (Konya ve Karaman) Bölge Planı, 2014-2023. Konya.

Olson, D.M., Dinerstein, E., Wikramanayake, E.D., Burgess, N.D., Powell, G.V.N., Underwood, E.C., D'Amico, J.A., Itoua, I., Strand, H.E., Morrison, J.C., Loucks, C.J., Allnutt, T.F., Ricketts, T.H., Kura, Y., Lamoreux, J.F., Wettengel, W.W., Hedao, P., Kassem, K.R. 2001. Terrestrial ecoregions of the world: a new map of life on Earth. Bioscience 51(11): 933-938.

Orman ve Su İşleri Bakanlığı. 2016. Ulusal Kuraklık Yönetimi Strateji Belgesi ve Eylem Planı, 2017-2023. Ankara.

Orman ve Su İşleri Bakanlığı. 2015. Çölleşme ile Mücadele Ulusal Stratejisi ve Eylem Planı, 2015-2023. Çölleşme ve Erozyonla Mücadele Genel Müdürlüğü. Ankara.

Orman ve Su İşleri Bakanlığı. 2014. Ulusal Havza Yönetim Stratejisi 2014-2023. Ankara.

Orman ve Su İşleri Bakanlığı. 2013. Erozyonla Mücadele Eylem Planı, 2013-2019. Ankara.

Orta Anadolu Kalkınma Ajansı. 2014. TR72 Bölgesi (Kayseri, Sivas, Yozgat) Bölge Planı, 2014-2023. Kayseri.

Özhatay, N. 2006. Türkiye'nin BTC boru hattı boyunca önemli bitki alanları. BTC şirketi, İstanbul.

Özhatay, N., Byfield, A., Atay, S. 2003. Türkiye'nin Önemli Bitki Alanları. WWF-Türkiye (Doğal Hayatı Koruma Vakfı), İstanbul.

Quézel, P. 1973. Contribution à l'étude phytosociologique du massif du Taurus. Phytocoenologia 1(2): 131-222.

Ray, N., Adams, J. 2001. A GIS-based vegetation map of the world at the last glacial maximum (25,000-15,000 BP). Internet Archaeology: 11.

Rouse, J.W., Haas, H., Schell, J.A., Deering, D.W. 1974. Monitoring Vegetation Systems in the Great Plains with ERTS, Proceedings, Third Earth Resources Technology Satellite-1. Symposium, Greenbelt.: NASA SP-351: 3010-3017.

Sanayi ve Teknoloji Bakanlığı. 2021a. Doğu Anadolu Projesi (DAP) Bölge Kalkınma Programı (2021-2023). Ankara.

Sanayi ve Teknoloji Bakanlığı. 2021b. Doğu Karadeniz Projesi (DOKAP) Bölge Kalkınma Programı (2021-2023). Ankara.

Sanayi ve Teknoloji Bakanlığı. 2021c. Güneydoğu Anadolu Projesi (GAP) Bölge Kalkınma Programı (2021-2023). Ankara.

Sanayi ve Teknoloji Bakanlığı. 2021d. Konya Ovası Projesi (KOP) Bölge Kalkınma Programı (2021-2023). Ankara.

Schiechtl, H.M., Stern, R., Weiss, E.H. 1965. In anatolischen Gebirgen. Klangenfurt. Verlag der Geschichtsvereines für Kaernten.

Serhat Kalkınma Ajansı. 2014. TRA2 Bölgesi (Ağrı, Ardahan, Iğdır, Kars) Bölge Planı, 2014-2023. Ağrı

Takhtajan, A., Crovello, T.J., Cronquist, A. 1986. Floristic regions of the world (Vol. 544). Berkeley: University of California Press.

Tarım ve Orman Bakanlığı. 2019a. Ulusal Biyolojik Çeşitlilik Eylem Planı, 2018-2028. Ankara.

Tarım ve Orman Bakanlığı. 2019b. Tarımsal Meteoroloji, Çevre ve Doğal Kaynakların Yönetimi- Mera Yönetimi Çalışma Grubu Belgesi. 3. Tarım Orman Şurası. Ankara.

Tarım ve Orman Bakanlığı. 2018a. Orman Genel Müdürlüğü Stratejik Plan, 2019-2023. Ankara.

Tarım ve Orman Bakanlığı. 2018b. Tarım ve Orman Bakanlığı Stratejik Plan, 2019-2023. Ankara.

Tarım ve Orman Bakanlığı. 2018c. Yaşayan Alanlar, Yaşamak için Alanlar. Türkiye'de NATURA 2000. Ankara.

Tarım ve Orman Bakanlığı-Birleşmiş Milletler Gıda ve Tarım Örgütü (FAO) Bozkır Ekosistemlerinde İklim Değişikliğine Ekosistem Tabanlı Uyum (EBA) Projesi Verileri.

Turan, N. 1984. Türkiye'nin Av ve Yaban Hayvanları Memeliler. Ongun Kardeşler Matbaacılık. 178 pages.

Turak, A., Balkız, Ö., Ambarlı, D., Durmuş, M., Özkil, A., Yalçın, S., Özüt, D., Kınıkoğlu, Y., Meydan Kocaman, T., Cengiz, S., Albayrak, F., Kurt, B., Zeydanlı, U., Bilgin C. 2011. Karadeniz Bölgesi Sistematik Koruma Planlaması. Ankara. Doğa Koruma Merkezi.

TÜİK. 2018b. Adrese Dayalı Nüfus Kayıt Sistemi Veritabanı. Accessed on: 20 February 2020 [http://www.tuik.gov.tr]

Türkiye Cumhuriyeti Cumhurbaşkanlığı Strateji ve Bütçe Başkanlığı. 2019. On Birinci Kalkınma Planı. Ankara.

UNCCD. 2019. The Convention. United Nations Convention to Combat Desertification. Accessed on: 15 March 2020. http://www2.unccd.int/

UNDP. 2019. Sürdürülebilir Kalkınma Hedefleri. Accessed on: 15 March 2020. http://www.tr.undp.org/content/turkey/tr/home/sustainable-development-goals.html

UNESCO. 1973. International Classification and Mapping of Vegetation. UNESCO ser. Ecology & Conservation No. 6.

Version 4 DMSP-OLS Nighttime Lights Time Series. Accessed on: 20 January 2021. http://www.ngdc.noaa.gov/eog/dmsp/downloadV4composites.html

Walter, H. 1956. Das problem der zentralanatolischen steppe. Naturwissenschaften 43: 97-102.

Welch, H.J. (editor) 2004. GAP Biyolojik Çeşitlilik Araştırma Projesi 2001-2003 – Sonuç Raporu. DHKD (Doğal Hayatı Koruma Derneği), İstanbul.

Zeydanlı, U., Turak, A., Bal, M., Domaç, A., Bilgin, C.C. 2006. Aşağı Kafkaslar Boşluk Analizi (Sistematik Koruma Planlaması) Projesi Final Raporu. (Unpublished report), Doğa Koruma Merkezi, Ankara.

Pisum sativum

ANNEX 1. Analysis of Legislation and Top Policy Documents

INTERNATIONAL CONVENTIONS and PROGRAMS

Title of the Convention	Scope of the Convention
The Convention on Biological Diversity (CBD, 1997)	It aims at the conservation and sustainable use of biodiversity and the fair sharing of benefits derived from the use of genetic resources.
	In the 10th Meeting of the Conference of the Parties to the Convention, the Biodiversity Strategic Plan and the 2020 Biodiversity Targets, which are called Aichi Targets, were accepted for the main purpose of halting the loss of biodiversity in the world by 2020. The vision of the Strategic Plan is a world of "Living in harmony with nature" where "By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people". The Strategic Plan includes targets for 2015 and 2020 in 20 headlines ("Aichi Biodiversity Targets") that are organized under five strategic goals.
	These goals and targets include mainstreaming biodiversity concerns throughout government and society and addressing the underlying causes of biodiversity loss; reducing the pressures on biodiversity and promoting its sustainable use; improving the status of biodiversity by safeguarding ecosystems, species, and genetic diversity; enhancing the benefits derived from biodiversity and ecosystems for all (the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising From Their Utilization comes into force); enhancing implementation through participatory planning, knowledge management, and capacity building.
	It sets out the framework for means to address the conservation and sustainable use of steppe biodiversity.
The Convention on Biological Diversity Programme of Work	The Conference of the Parties to the Convention on Biological Diversity (COP) has established 7 thematic programmes of work that correspond to the main biomes on the planet. Two of these are associated with the conservation and sustainable management of steppe biodiversity.
	Arid and semi-arid lands programme of work (decision V/23, Annex 1) comprises objectives related to assessments of the status and trends of biodiversity in arid lands, Mediterranean, arid, semi-arid, grassland and savannah ecosystems, building knowledge on ecological, physical and social processes, identifying local and global benefits, identifying practices of good management including knowledge, innovation and practices of local people and promoting specific measures for the conservation and sustainable use of biodiversity, promoting a responsible resource management through an ecosystem-based approach, and supporting sustainable livelihoods by diversifying livelihoods, sustainable harvesting, innovative and sustainable use of biodiversity.
	The objectives of the agricultural biodiversity programme of work (decision V/5, annex) are assessment of the state and trend of agricultural biodiversity, underlying causes of change and knowledge of management practices; determining adaptive management techniques, practices and policies; capacity building, raising awareness and promoting responsible actions, and mainstreaming national plans and strategies to relevant agricultural policies for the conservation and sustainable management of agricultural biodiversity.

Title of the Convention	Scope of the Convention
United Nations Framework Convention on Climate Change (UNFCCC, 2004)	It encourages parties to cooperate in the international arena against the effects of global warming on the climate, caused by human-induced activities, to reduce greenhouse gas emissions, to cooperate on research and technology, and to protect carbon sinks.
	The management of sensitive natural resources such as steppe ecosystems and the adaptation of these ecosystems to climate change are important. As stated in Article 2, the natural adaptation of the ecosystem to climate change is one of the objectives of the convention.
United Nations Convention to Combat Desertification (UNCCD, 1998)	It provides long-term strategies and objectives on land restoration and rehabilitation, sustainable land management and sustainable management of water resources to combat desertification/land degradation and drought. The UNCCD 2018-2030 Strategic Framework Document defines a vision of a future that avoids, prevents and reverses desertification/land degradation and mitigates the effects of drought in affected areas and neutralizes land degradation in line with the UN 2030 Sustainable Development Goals. Strategic Objectives 2, 3 and 4 are determined as improving the conditions of affected ecosystems, combating desertification/land degradation, promoting sustainable land management and contributing to the neutralization of land degradation, increasing the drought resistance of fragile ecosystems and contributing to biodiversity and climate change issues.
	Steppe areas, many of which are of rangeland characteristics, are faced with land degradation, and there is a biological/ecological and economical decrease or loss of productivity in these areas. Therefore, strategies, objectives, approaches and practices within the scope of the convention are important for steppe ecosystems.
Sustainable Development Goals (2015)	Sustainable Development Goals (SDG), also known as the Global Goals, consist of 17 Goals towards eliminating poverty, protecting our planet and ensuring that all people live in peace and prosperity. In relation to the conservation and sustainable management of steppes, SDG 15 has been determined as "To protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss". Under this goal, there are targets related to the conservation of terrestrial ecosystems, their sustainable use and restoration, the conservation of habitats and species, the fair and equitable sharing of the benefits gained from the use of genetic resources, and the promotion of access to such resources, the prevention of illegal hunting and smuggling, the provision of financing and the provision of sustainable livelihoods to local people.
IPARD Framework Agreement and Sectoral Agreements	IPARD is the Rural Development component of the Instrument for Pre-Accession Assistance, established by the European Union (EU) to support candidate and potential candidate countries.
	It aims to support the harmonization initiatives for the implementation and management of the Common Agricultural Policy, Rural Development Policy and related policies of the European Union and policy development in this context. It is important for the opportunities it creates to compensate agricultural producers for loss of income arising from their commitments to the conservation of the environment and natural resources.

NATIONAL LAWS and REGULATIONS

Legislation	Scope of the Legislation	Relevance to the Steppes
Pasture Law (No. 4342 of 25.02.1998)	The law covers determination of rangelands, summer pastures, winter pastures, and public rangelands and meadows, allocating them to the legal entities of the village or municipalities, utilizing them in line with the rules to be determined, their maintenance and rehabilitation, increasing and sustaining their productivity, supervising their use regularly, protecting them and changing the purpose of use when necessary.	Most of the steppe areas are classified and managed as rangelands. This law not only provides for the protection of rangelands but also determines the basic principles of their utilization.
Pasture Regulation (Official Gazette No. 23419 of 31.07.1998)	The principles and procedures for the implementation of the Law on the Amendment of Some Articles of the Pasture Law No. 4368 dated 11.06.1998 are regulated by the Pasture Law No. 4342 and 25.02.1998. It includes administrative and managerial provisions regarding the restriction and allocation of rangelands, meadows and summer pastures, and grazing plans.	The Pasture Law has been elaborated by addition of paragraphs to some of its articles. This way, the Pasture Law also regulates the protection-utilization principles of the meadows, rangelands, summer pastures or other areas mentioned in the law that may be related to steppes.
Forest Law (No. 6831 of 31.08.1956)	It includes principles for planning, operating forests, and conservation of forests and its ecosystems.	It constitutes the framework for the management, development and protection of steppes with trees. In this respect, it is closely related to the improvement and conservation of the steppe areas or the degradation of the steppe vegetation. In addition, it includes the prevention of soil erosion and reducing the pressures of grazing on forests by means of rehabilitation works in in-forest, forest edge and upper forest line.
Forest Management Regulation (Official Gazette No. 26778 of 05.02.2008)	It aims to determine the procedures and principles regarding the inventory of the state forests, forests belonging to the legal entities and private forests, the arrangement, renewal, interim inspection, implementation of the management plans, changes in the plan, and performing or arranging the inspection.	It implements the ecosystem-based functional planning approach, which takes into account the economic, ecological, social, and cultural functions of forests, with the management plans. As a result of the biodiversity inventories, forestry activities are carried out according to the biological characteristics and ecological demands of species in places where important, endangered, rare, and endemic species and similar sites are identified.

Legislation	Scope of the Legislation	Relevance to the Steppes
National Afforestation and Erosion Control Mobilization Law (No. 4122 of 23.07.1995)	It regulates the principles and procedures of afforestation and erosion control works to be carried out by public institutions and organizations and real and legal persons in order to increase the forest area and tree wealth, to establish and improve the balance between soil, water and plants, and to conserve environmental values.	
Regulation on Forest Services on Afforestation and Erosion Control (Official Gazette No. 29945 of 11.01.2017)	It covers afforestation, rehabilitation, erosion and flood control, prevention of avalanches and landslides, rangeland rehabilitation, tree rehabilitation, seed and seedling production, nursery and reconstruction works to increase forest area, increase biodiversity and rebuild the degraded forest ecosystem. It includes the arrangements for the regulation of the expenditures to be made for the restoration works and the collection of the revenues.	It includes provisions on special afforestation, including in steppes with trees, , areas reserved by grazing plan, and passageways for summer pastures and winter pastures, which have been used since ancient times, in terms of rehabilitation works in forests, forest edges and upper forest line rangelands and prevention of soil erosion.
Regulation on Afforestation (Official Gazette No. 30927 of 23.09.2019)	It elaborates on the procedures and principles regarding afforestation, rehabilitation, erosion and flood control, prevention of avalanches and landslides, rangeland rehabilitation, tree rehabilitation, production of seeds and seedlings of forest trees, shrubs, and flora, nursery and reconstruction works.	
Environment Law (No. 2872 of 09.08.1983)	It covers the relevant procedures in order to protect the environment, which is the common asset of all living things, in line with the principles of sustainable environment and sustainable development. The Law regulates the permissions to polluting activities within the scope of the "polluter pays" principle and the penalties to be paid in case of polluting the environment, and it also states that activities known to have a polluting effect within the scope of the "Preventive Principle" require Environmental Impact Assessment.	Conservation of biodiversity and the ecosystem is essential. Protection of natural resources such as air, water, and soil and prevention of pollution are basically handled by this law. Stubble burning, destruction of meadows and rangelands and all activities that cause erosion are prohibited. However, in the regions where the second crop is planted, controlled stubble burning is allowed within the scope of the action plan prepared by the governorships.
National Parks Law (No. 2873 of 09.8.1983)	It regulates the principles of selection and designation of national parks, nature parks, natural monuments, and nature reserves of national and international value in Turkey and the conservation, development, and management of such areas by preserving their features and character.	Natural steppes may fall within the borders of protected areas. The law includes provisions on the wildlife hosted by these areas and protection of ecosystem values.

Legislation	Scope of the Legislation	Relevance to the Steppes
Terrestrial Hunting Law (No. 4915 of 01.07.2003)	It includes provisions regarding the protection and development of game and wild animals together with their natural habitats for sustainable game and wildlife management, controlling and regulating hunting, using hunting resources to the benefit of the national economy, and cooperating with relevant public and private law legal entities. Within the framework of the law, areas where wild animals that are threatened or are in danger of extinction are naturally found are protected for the conservation of these species together with their habitats without deteriorating their ecosystem characteristics.	Wildlife protection and breeding areas are established according to this law. Based on the law, the "Regulation on Principles and Procedures for Protection of Game and Wild Animals Together with their Habitats and Prevention of Pests and Diseases" governs the procedures and principles regarding the protection of the habitats of game and wild animals, translocation of species, their placement, protective measures, their collection and capture in nature, management of predatory species and management of their pests and diseases. It also includes provisions on species of game and wild animals, their survival in the natural environment, their protection, protected areas, habitats, capture, collection, scientific research, banding and marking, and diseases together with penal provisions.
Law on the Conservation of Cultural and Natural Property (No. 2863 of 21.07.1983)	It determines the definitions regarding the movable and immovable cultural and natural assets that need to be protected and regulates the transactions and activities to be carried out. Natural Reserves are announced according to this Law.	Some of the natural steppes fall within the borders of the protected areas. The law includes provisions on the conservation of the wildlife hosted by these areas and the ecosystem values.
Regulation on the Protection of Wetlands (Official Gazette No.28962 of 04.04.2014)	It provides especially for the implementation of the Convention on Wetlands of International Importance as Waterfowl Habitat (Ramsar Convention), cooperation and coordination between institutions and organizations, protection and development of wetlands.	The regulation is important for the protection of wetland ecosystems and the management of the ecosystem services they provide. Shallow lakes and wetlands intertwined with steppe ecosystems and their ecosystem services are important in terms of conservation.
Regulation on Procedures and Principles (Official Gazette No. 28358 of 19.07.2012)	It determines the procedures and principles regarding the registration, approval, and designation of national parks, nature parks, natural monuments, natural reserves and wetlands, as well as the determination, registration, approval, change, and the designation of the natural asset, natural sites, and special environmental protection areas. Except for movable natural assets, it covers natural assets, natural sites, special environmental protection areas, national parks, nature parks, natural monuments, nature reserves, and wetlands.	Although there is no protected area status separately for steppes, steppe ecosystems are covered by some of the current protected areas. The inclusion of potential steppe areas in protected areas and the conservation of steppe species and habitats within existing protected areas is of great importance.

Legislation	Scope of the Legislation	Relevance to the Steppes
Agriculture Law (No. 5488 of 15.04.2006)	It covers the implementation procedures and principles regarding the determination of the policies necessary for the development and support of the agricultural sector and the rural areas, making regulations, determining the scope and subjects, creating and implementing programs, financing and administrative structures, priority research and development programs.	The law also includes the conservation and development of natural and biological resources within the objectives of agricultural policies. Most of the steppe areas are classified and managed as agricultural lands or rangelands. In the law, the issue of agricultural basins is included as an explicit provision in order to concentrate, support, organize, specialize, and conduct agricultural production in ecologically suitable areas. It contributes to the conservation of the steppes with agricultural support programs such as EFALP.
Regulation on Agricultural Basins (Official Gazette No. 27695 of 07.09.2010)	It regulates the principles and procedures for carrying out, supporting, organizing, specializing in agricultural activities in an integrated manner in the agricultural basins determined for the development of agricultural production in suitable ecologies, and doing agricultural inventories.	With these practices, it is possible to adapt to changing climatic conditions in effective use, protection and planning of soil and water resources.
Resolution and Communiqué on Supporting Agricultural Investments within the Scope of Rural Development Supports (21.10.2016 and 13.09.2017)	Its purpose is to determine the principles and procedures for supporting small and medium-sized enterprises in order to ensure the integration of agricultural production and agriculture-based industry with a focus on conserving natural resources and the environment, developing the agricultural marketing infrastructure, strengthening food security, creating alternative income sources in rural areas, strengthening rural economic infrastructure, promoting new technologies developed for agricultural activities by the producers and supporting investments involving new technology.	Practices such as supporting livestock-oriented rural development, implementing conservation-oriented measures such as rangeland rehabilitation, popularizing new technologies such as efficient irrigation systems, increasing the value chain in animal products contribute to the conservation of steppes.
Communiqué on Implementation Principles Regarding Livestock Supports (No. 016/26 of 24.06.2016)	Its purpose is to develop animal husbandry in Turkey, to strengthen and sustain healthy production, to conserve genetic resources of domestic animals in situ and to develop them, to keep the records and system up-to-date, to increase the efficiency of livestock policies, and to support the breeders in animal disease control.	It determines the supports for all kinds of animal husbandry practices including apiculture. It provides for the necessary supports to handle livestock in a more efficient and sustainable way.

Legislation	Scope of the Legislation	Relevance to the Steppes
Soil Conservation and Land Use Law (No. 5403 of 03.07.2005) Law of Amendment on Soil Conservation and Land Use Law (No. 6537 of 30.04.2014)	It determines the procedures and principles that ensure planned land use in accordance with the principle of sustainable development and environmental priority by preventing the loss of soil and its qualities. In this context, the law includes provisions on making land use plans, preparing land use plans and projects for agricultural purposes, preparing soil conservation projects, identifying and protecting large plains with high agricultural potential, determining and protecting areas susceptible to erosion, monitoring and preventing soil pollution, land consolidation and distribution, penalties for misuse of agricultural lands, and penalties for non-agricultural land uses. The smallest agricultural parcel size according to provinces and districts is defined in order to determine the minimum agricultural land and the agricultural land with sufficient income and to prevent their partition. Agricultural lands that reach the minimum size determined by this law become indivisible property.	Any intervention aimed at protecting agricultural lands, including agricultural lands with steppe ecosystems, particularly the introduction of natural steppes to agriculture, is covered by the Soil Conservation and Land Use Law. Studies on land size and management efficiency increase productivity and reduce the use and cultivation of marginal lands.
Regulation on Conservation, Use and Planning of Agricultural Land (Official Gazette No. 30265 of 09.12.2017)	It aims at the determination of the land and land assets foreseen in the Law on Soil Conservation and Land Use No. 5403 dated 3.7.2005, classification and development of agricultural lands, allowing for unintended use in case of necessity, determination and protection of the soil and large plains with high agricultural production potential, soil preservation plans, preparation and implementation of projects, determination of areas susceptible to erosion, the formation of the soil conservation boards, its duties, works and the planned use of lands in accordance with the environmental priority principle of sustainable development. Within the scope of the Regulation, Soil Conservation Boards established in each province have important duties for protection, development and utilization of agricultural lands efficiently, land use, improvement of land properties, conservation and recovery, and realization of soil preservation measures.	It is among the regulations that contribute to the sustainability of agricultural biodiversity.

Legislation	Scope of the Legislation	Relevance to the Steppes
Regulation on the Support of Farmers Using Environmentally-Friendly Agricultural Techniques and Providing Technical Assistance (Official Gazette No. 25994 of 15.11.2005)	It aims to support farmers who prefer to use agricultural production techniques that protect the environment, reduce the negative effects of agricultural practices on the environment, prevent erosion, maintain renewable energy resources, and protect the natural cover and soil and water quality in vulnerable areas.	Agriculture with reduced tillage is an important program for the protection of the soil and water structure, prevention of erosion, environmentally friendly agriculture techniques, and the conservation of the steppes.
Organic Farming Law (No. 5262 dated 03.12.2004) Regulation on the Principles of Organic Farming and Their Implementation (Official Gazette No. 27676 of 18.08.2010)	It determines the procedures and principles for taking the necessary measures to improve the production of organic products and inputs in order to provide safe and quality products to the consumer. It covers the performance of control and certification services related to the execution of organic farming activities and the inspection procedures and principles of the Ministry, as well as the issues regarding powers, duties and responsibilities. Preserving the ecological balance, conducting organic agricultural activities, regulating, developing and disseminating organic agricultural production and marketing is also covered.	It is one of the most powerful tools to control the use of fertilizers in agricultural production. Since it does not allow the use of chemicals, the practice of organic agriculture provides an important opportunity for the protection and improvement of soil and water resources.
Regulation on Good Agricultural Practices (Official Gazette No. 27778 of 07.12.2010)	It aims to ensure agricultural production that does not harm the environment, human and animal health, and provides for conservation of natural resources, traceability and sustainability in agriculture, and reliable product supply.	Good agricultural practices are important in terms of conserving soil and water resources and ensuring more sustainable use.
Protection of Waters Against Nitrate Pollution from Agricultural Sources (Official Gazette No. 29779 of 23.07.2016) Good Agricultural Practices Code for Protection of Waters Against Nitrate Pollution from Agricultural Sources (No. 2016/46 of 11.02.2017)	It aims to detect, reduce and prevent the pollution caused by agricultural nitrate in waters. The regulation covers the technical and administrative principles regarding the determination and control of nitrogen and nitrogen compounds that cause pollution in underground and surface waters and soils, and mitigation of pollution. It contains rules and implementation principles that must be followed by farmers in areas that are nitrate-sensitive and in those that are not.	The regulation supports steppe ecosystems by adopting good agricultural practices in the use of fertilizers (appropriate periods of fertilizer applications, amount of fertilizer to be used according to climate and soil conditions, crop rotation systems, irrigation, etc.).

Legislation	Scope of the Legislation	Relevance to the Steppes

Legislation	Scope of the Legislation	Relevance to the Steppes
Regulation on Organic, Mineral and Microbial Fertilizers Used in Agriculture (Official Gazette No. 30341 of 23.02.2018)	Its purpose is to determine the procedures and principles to improve the physical, chemical and biological structure of soils, to increase productivity in plant production, to protect human health and to mitigate environmental pollution, to promote the use of organic, mineral, and microbial fertilizers, to define and determine the analysis methods for these products and to import, export, produce, supply to the market and to record these products.	It supports steppe ecosystems with the use of organic, mineral and microbial fertilizers.
Biosafety Law (No. 5977 of 18.03.2010)	Its purpose is to determine, within the framework of scientific and technological developments, the procedures and principles to prevent the risks that may arise from genetically modified organisms and their products obtained by using modern biotechnology, to establish and implement a biosecurity system, to control, regulate and monitor these activities in order to protect and maintain human, animal and plant health, environment and biodiversity.	It is an important piece of law in terms of protecting natural ecosystems and gene resources. It also forms the basis for biological solutions that can be used to reduce greenhouse gases.
Law on Veterinary Services, Phytosanitation, Food and Feed (No. 5996 of 11.06.2010)	It aims to protect and ensure food and feed safety, public health, plant and animal health, animal breeding and welfare, taking into account consumer interests and the protection of the environment.	It is a legal instrument regulating the fight against harmful organisms in plants and plant products. It is important to protect water resources from agricultural pollutants.
Seed Law (No. 5553 of 31.10.2006)	It aims to increase the yield and quality in crop production, to ensure quality assurance for seeds, to make regulations on seed production and trade, and to restructure and develop the seed sector.	It includes the sustainability of natural resources and the protection of agricultural ecosystems through certification in seeds and the use of proper seeds. It is especially important in terms of protecting the gene resources required for adaptation in the medium and long term.
Regulation on the Collection, Production and Export of Natural Flower Bulbs from Nature (Official Gazette No. 30014 of 21.03.2017)	It regulates the procedures and principles for collecting, producing, harvesting, storing and exporting seeds, bulbs, tubers, rhizomes, corms or other parts from nature for the protection of natural flower bulb species.	It is an important tool for consideration in conserving steppe plant diversity.
Agricultural Insurance Law (No. 5363 of 21.06.2005)	It regulates the rules for the establishment of agricultural insurance in order to compensate the losses of the farmer against agricultural risks.	It is an important tool in terms of ensuring the sustainability of production in agriculture. Addressing sustainable agriculture and livestock practices within the scope of insurance can reduce the risk factor associated with new ventures.
Law on the Assistance to Farmers Who Have Suffered Losses Due to Natural Disasters (No. 2090 of 05.07.1977)	It provides necessary assistance to farmers who suffer from natural disasters such as storm, flood, overflow, frost, hail, drought, pests and diseases.	It is important in terms of ensuring sustainability in agricultural production by supporting farmers who suffer economic losses due to natural disasters.

Legislation	Scope of the Legislation	Relevance to the Steppes
Law on Land Reform Regarding Rearrangement of Land in Irrigated Areas (No. 3083 of 22.11.1984)	It aims to develop practices based on the efficient operation of irrigation areas and areas with high agricultural potential. It covers all measures such as land distribution and change, consolidation, in-field development services, and management of irrigation investments. For this purpose, it has strong powers, including the distribution of the lands in the hands of the State, expropriation, allocation of agricultural land for different purposes in line with the public interest.	The law specifically includes arguments suitable for the development of policies that take into account climate change in irrigation areas. Its guiding effect on the use of water resources is important.
Regulation on Land Consolidation and In-Field Development Services Implementation (Official Gazette No. 30679 of 07.02.2019)	It determines the principles and procedures regarding the consolidation of agricultural lands and in-field development services.	It is possible to lose habitat parts that are important as ecological corridors for steppe species through land consolidation works.
Regulation on Preparation, Implementation and Follow-up of Basin Management Plans (Official Gazette No. 28444 of 17.10.2012)	It aims to regulate the procedures and principles regarding the preservation of surface and underground water bodies with a holistic approach on a basin basis, physicochemical, chemical and ecological quality components and those that are in good water condition in terms of quantity, bringing the degraded ones to good water status and ensuring sustainable use by allocating them in accordance with the needs priorities, preparation, implementation and follow-up of national water plan and basin management plans.	It is an important tool for the integration of agricultural practices that support steppe ecosystems into basin management plans.
Aforementioned Communiqués on the Prevention of Burning Stubbles (Updated annually by Presidential Decisions)	Governorships issue Communiqués on Principles and Procedures for Prevention of Stubble Fires for provinces every year and their implementation is closely monitored.	The protection of steppe ecosystems and soil assets is important in terms of mitigation and preservation of soil carbon. Opportunities for the expansion of conservation agriculture (direct seeding) activities.
Aforementioned Communiqués on the Execution of Combine-Harvester Control Services (Updated annually by Presidential Decisions)	Governorships annually issue a Governor's Office Communiqué on the Execution of Combine-Harvester Control Services for provinces and monitor their implementation. It covers the procedures and principles regarding the operation and utilization of combine-harvesters, and the execution and inspection of control services, with a view to ensuring the public order and public trust by making sure that the field crops are harvested in a timely manner, with the least product loss, keeping the product losses and damages at the lowest level, and preventing uneducated and unequipped combine-harvester services.	It is to be born in mind for conservation agricultural practices and reduced pressure on natural resources due to faster and timely harvesting.

NATIONAL DEVELOPMENT PLANS

Top Policy Document	Policies, Priorities and Objectives Related to Steppe Ecosystems
Eleventh Development Plan (2019-2023)	**The term "steppe" (*"bozkır" or "step", in Turkish*) does not appear in the Eleventh Development Plan. However, there are related policies and measures that will contribute to the protection and sustainable management of steppe ecosystems under the headings of "Agriculture", "Urban Infrastructure", "Rural Development", "Protection of the Environment".**

"Agriculture" under "Competitive Production and Productivity"

- To ensure protection, effective use and management of agricultural lands (405)

- To disseminate modern irrigation systems such as sprinkler and drip irrigation to ensure efficient use of water in agriculture. (406.3)

- To support good agricultural practices, organic farming, contracted farming, clustering, research, marketing and branding, in order to increase product reliability, diversity and production, particularly for high value added medicinal and aromatic plants (407.2)

- To accelerate the determination, restriction and registration processes for rangelands, summer pastures and winter pastures, to ensure that the rangelands are rehabilitated to boost the production of high-quality forage crops and to support forage crop production. (408.4)

- To increase the inspection and training activities to combat uninformed pesticide use in plant production and to support and disseminate biological and biotechnical management practices alternative to chemical practices. (410.4)

- **To ensure conservation and sustainability of biodiversity in the field of local animal breeds and seeds in agricultural production. (412)**

- **To complete the biodiversity inventory, to monitor important species and specific areas, to establish a mechanism for sharing of benefits from genetic resources and related traditional information, to record traditional biodiversity-based information and to make them available for R&D purposes. (412.1)**

- To make arrangements for the establishment of accredited nature farms in order to ensure sufficient quantity of local breed animal and seed assets. (412.2.)

- Reproduction of local seeds of fruits, grains, medicinal and aromatic plants, especially winter vegetables, and local animal breeds in nature farms and transforming them into sustainable value-added products. (412.3.)

- To make local products, geographically indicated agricultural products and medicinal and aromatic products subject to trade by increasing the product value through improvements in promotion, marketing, and branding. (414.1)

- **To support the studies conducted in research institutes especially in the areas of animal and plant breeding, biotechnology, and biodiversity conservation within the framework of public institutions, university, and private sector cooperation. (416.2)**

- To develop and support innovative and environmentally-friendly production techniques, especially smart agricultural technologies. (416.4)

Top Policy Document	Policies, Priorities and Objectives Related to Steppe Ecosystems
Eleventh Development Plan (2019-2023)	*"Urban Infrastructure", "Rural Development", and "Environmental Protection" Under "Livable Cities, Sustainable Environment"*
	- Implementation of basin-based plans, strategies and action plans within the scope of protection, development and sustainable use of water resources (697)
	- To program rural development supports with a focus on farmers and the environment, to make arrangements to eliminate the existing multi-headedness in the execution of supports, to ensure complementarity and effectiveness in practice. (707)
	- To keep rural heritage alive and to protect natural and cultural assets in order to ensure the sustainability of rural production and lifestyles. (710)
	- To support initiatives and collaborative initiatives that will carry knowledge on traditional production and preservation in areas such as traditional crafts and handicrafts specific to villages, agro-tourism, geographically marked products, ornamental plants, viticulture, apiculture, fishing, poultry farming, cultivation of alternative agricultural products, agricultural products and food to future generations by ensuring that the production and lifestyles in the villages, as well as nature and cultural assets, are protected. (710.1)
	- **Detection, registration, protection, sustainable use, development, monitoring, and prevention of smuggling of biodiversity and genetic resources, forwarding the benefits of genetic resources and related traditional information to our country. (716)**
	- **Effective management of nature conservation areas by increasing the number of protected areas on land and sea for the protection, restoration, and sustainable use of ecosystems and ecosystem services. (717)**

NATIONAL STRATEGY and ACTION PLANS

Top Policy Document	Policies, Priorities and Objectives Related to Steppe Ecosystems
National Biodiversity Strategy and Action Plan – NBSAP (2007)	**With NBSAP, goals for 6 thematic areas, namely agricultural biodiversity, forest biodiversity, steppe biodiversity, mountain biodiversity, inland waters biodiversity, and coastal and marine biodiversity, and 4 common goals for all thematic areas have been determined. "Goal 5" in the strategy directly targets the steppe ecosystems, and the common goals include objectives and actions related to steppe ecosystems.**
	"To protect steppe biodiversity, to ensure the sustainable use of its components, as well as to ensure the fair and equitable sharing of the benefits from the utilization of genetic resources; and to combat the loss of steppe biodiversity and the socio-economic results of that" (Goal 5). This includes goals and actions directly related to steppe ecosystems.
	- To fill the information gaps concerning steppe biodiversity (Objective 5.1)
	- To identify ecological, physical and social processes such as grazing, drought, desertification, aridity, salinity, floods, fires, tourism, agricultural transformation or abandonment which have adverse effects on the biodiversity of steppe ecosystems and mainly on the ecosystem structure and function, and to take measures regarding the abovementioned (Objective 5.2)
	- To establish mechanisms and frameworks in order to support the fair and equitable sharing of the benefits from the utilization of the genetic resources of steppe areas (Objective 5.3)

Top Policy Document	Policies, Priorities and Objectives Related to Steppe Ecosystems
	Also, "To identify, protect and monitor biodiversity components which are important to Turkey (Goal 1)", "To use biodiversity components in a sustainable manner by applying the methods at a level fitting to their renewal capacity by taking the future generations' needs into account (Goal 2)" "To identify, protect and utilize the components of genetic diversity, including the traditional knowledge, which are important to Turkey (Goal 3)". This includes common goals and actions for all thematic areas also associated with steppe ecosystems. "The designation of special areas in the steppe ecosystems which are especially important for biodiversity and/or are specifically under threat and establishing protection status for these areas (Strategic Action 1.2.3)". This is specifically related to the steppe ecosystems.
	The Strategy offers information about identification and classification of steppe ecosystems in Turkey, the current state of steppe ecosystems, native animal breeds and plant species of steppes, threats to the steppes. It also emphasizes that the existing protected areas do not adequately represent the biodiversity components of our country, especially steppe and marine ecosystems.
National Biodiversity Action Plan – NBAP (2008-2028)	**NBAP national targets do not include objectives directly related to the "steppe". However, since the NBSAP Goals and Objectives are valid for 2018-2028 and are associated with NBAP, the national objectives specified in the NBAP also support steppe ecosystems**.
	- Determining the pressure and threats on biodiversity and ecosystems and reducing or eliminating them as much as possible
	- Developing species-specific and ecosystem-based conservation approaches (traditional and modern) by determining, monitoring, evaluating the biodiversity elements (ecosystem, species, and genetic diversity)
	- Ensuring sustainable management by preserving the biodiversity of areas exposed to agriculture, forestry, and fishing activities
	- Raising awareness of the public and administrators about ecosystem services, increasing the benefits arising from ecosystem services, and ensuring sustainable biodiversity management
	- Providing the rehabilitation and restoration of ecosystems damaged due to different reasons, developing measures to prevent damage to healthy ecosystems and eliminating legislative gaps in this regard
	- Establishing a public, university and private sector cooperation mechanism and preparing long-term plans and programs for the development of high value-added products based on knowledge and technology within the framework of conservation and sustainable use of biological resources
	- Preparing national legislation and establishing the necessary technical infrastructure, taking into account international conventions on access to genetic resources and the equal and fair sharing of benefits arising from their use.
Draft Ecosystem-Based Adaptation Strategy for Anatolian Steppe Ecosystems (2018)	**It aims to facilitate and encourage "Ecosystem-Based Adaptation" strategies and practices in steppe ecosystems for adaptation to climate change.** It includes 4 strategic objectives: Increasing the resilience of the affected and likely to be affected ecosystems to climate change, building a strong rural economy and a climate-resistant/resilient local society, integrating «Ecosystem-Based Adaptation» into policy, plan, and decision-making processes in a way that supports the climate change adaptation strategy, developing a management model by improving the management capacity of stakeholders. Under these strategic objectives, there are long-, medium-, and short-term goals and actions related to the conservation and management of steppes that support adaptation to climate change under the headings of agriculture and agriculture-related rangeland management, water management, and forestry management.

Top Policy Document	Policies, Priorities and Objectives Related to Steppe Ecosystems
Turkey's National Climate Change Strategy (2010-2023)	**The term "steppe" (*"bozkır" or "step", in Turkish*) is not mentioned in the Climate Change Strategy, but it contains long-, medium- and short-term targets within the scope of the "Land Use, Agriculture and Forestry" sector and "Adaptation to Climate Change" that will contribute to the conservation and sustainable management of steppe ecosystems.** - Under "Land Use, Agriculture and Forestry", there are goals related to rational use of fertilizers, certified seed production with organic farming and drought-tolerant plant species, use of in-farm modern pressurized irrigation systems, conservation, improvement and efficient use of soil and lands, and protection from soil erosion, effective implementation of Soil Conservation and Land Use Law and regulation of legislation, protection and improvement of meadows and rangelands, fertilization based on soil analysis results, and reducing urbanization pressure on rural and natural areas. - Under "Adaptation to Climate Change", there are goals related to agricultural drought, desertification and erosion, scientific studies on the sustainable use of natural resources, sustainable management of water resources, soil cultivation, drainage, irrigation techniques, mulching measures to prevent increased salinity in irrigated areas, and identification and vulnerability analysis of and combating the negative effects of climate change on sensitive ecosystems, urban biotopes and biodiversity.
Turkey's National Climate Change Action Plan – NCCAP (2011-2023)	**The Climate Change Action Plan includes purposes, objectives, and actions under 7 sectors. Among these, under the sector of "Land Use and Forestry", "Identifying the carbon sequestration potentials of scrublands and steppes, which spread across wide areas in Turkey (O1.1.1.3)" includes actions directly related to steppe ecosystems. It also includes related objectives and actions that will contribute to the conservation and sustainable management of steppe ecosystems under the "Agriculture" and "Land Use and Forestry" sectors.** - Under the "Agriculture" sector, dissemination of sustainable agricultural techniques such as direct planting, crop rotation, use of organic and green fertilizers, reduced tillage and no-till that will contribute to the conservation and sustainable management of the steppes, soil, crop production and rangeland management based on sustainable use of natural resources, improvement of irrigation infrastructure based on protection and effective use of water resources. - Under the "Land Use and Forestry" sector, consideration of biodiversity, wildlife, hydrology and carbon storage functions in rehabilitation and reclamation of in-forest rangelands.
Turkey's National Climate Change Adaptation Strategy and Action Plan – NCCASAP (2011-2023)	**NCCAP** and **NCCASAP** focus on five areas, namely Water Resources Management, Agriculture and Food Security, Ecosystem Services, Biodiversity and Forestry, Natural Disaster Risk Management, and Human Health. The goals and actions associated with integrated management of water resources, sustainable planning of agricultural water use, protection of soil and agricultural biodiversity against the effects of climate change; integrating the adaptation to climate change approach into ecosystem services, biodiversity and forestry policies; identifying and monitoring the effects of climate change on biodiversity and ecosystem services **contribute to the conservation and sustainable management of steppe ecosystems.** The action **"Conducting R&D studies to identify and monitor the effects of climate change on steppe ecosystems (target species, sensitive ecosystems) (UO2.6.3)" under the objective of "Identifying and monitoring the effects of climate change on the mountain, steppe, inland water, and marine ecosystems and on the ecosystem services they provide and developing measures for adaptation to climate change (OBJECTIVE UO2.6)" involves actions directly related to steppe ecosystems.**

Top Policy Document	Policies, Priorities and Objectives Related to Steppe Ecosystems
National Strategy and Action Plan to Combat Desertification – NSAPCD (2015-2023)	**NSAPCD includes outputs and actions directly related to improving steppe ecosystems, increasing management efficiency and ensuring their representation in the conservation network.** - Rehabilitation practices in forest, steppe, wetland, coastal zone and other natural habitats in line with natural ecosystem structure (Output 7.4) - Improved efficiency of steppe habitat conservation and management in protected steppe areas (Action 7.4.6) - Review and improvement of protected area definitions, ensuring the representation of different steppe types in the protected area network and making management plans in protected areas (Action 7.6.3) One of the strategic goals of NSAPCD is to create synergy between the three Rio Conventions, to protect biodiversity, and to contribute to the resolution of climate change through combating desertification/land degradation and sustainable land management. For this reason, it offers capacity building, coordination and cooperation, policy, science, technology, monitoring, and financing recommendations, which concern many sectors including agriculture, forestry, land use, rural development, nature conservation, and water management. Many of these recommendations include actions that contribute to the conservation and sustainable management of the steppes. In particular, under "Sustainable Land Management", climate change-oriented conservation measures and improvement practices that integrate the protection of biodiversity and ecosystem services are the basic ones.
National Rural Development Strategy (2014-2020)	**The term "steppe" (*"bozkır" or "step", in Turkish*) is not mentioned in the Strategic Plan. Environmentally-friendly agricultural production practices, sustainable natural resource management, and climate change issues are considered.** Within the scope of "Improving the Rural Environment and Ensuring the Sustainability of Natural Resources", which is one of the objectives of the Strategic Plan, use of environmentally-friendly production practices in agriculture, prevention of environmental pollution caused by animal waste, promotion of organic agriculture, dissemination of good agricultural practices, ensuring efficiency in agricultural irrigation and use of agricultural lands, keeping the protection and use balance in forest resources, alleviation of the development problems arising from the disadvantageous positions of the villages established in or around the protected areas, especially forest villages, strengthening sustainable livelihoods on the basis of participation, and protection of biodiversity and ecological wealth are targeted.
National Drought Management Strategy Document and Action Plan (2017-2023)	**The National Drought Management Strategy Document and Action Plan does not mention the term "steppe" (*"bozkır" or "step", in Turkish*) and does not include a policy and measure directly related to steppe ecosystems.** However, it includes goals and strategies such as preparing legislation on basin-based sustainable drought management, preparation, implementation and monitoring of drought management plans for effective management of drought, establishing drought prediction and early warning systems, carrying out integrated-participatory rehabilitation and basin improvement projects, creation of drought databases, informing the public about droughts, determining the effects of climate change on droughts and preparing adaptation strategies.

Top Policy Document	Policies, Priorities and Objectives Related to Steppe Ecosystems
National Basin Management Strategy and Action Plan (2014-2023)	**The National Basin Management Strategy and Action Plan does not mention the term "steppe" (*"bozkır" or "step", in Turkish*) and does not include a policy and measure directly related to steppe ecosystems. However, it is based on the sustainable management of water basins and the use of natural resources as a part of the ecosystem in the basins, within the framework of conservation and sustainability.** In this context, it includes goals, objectives and strategies including legal regulations, programs and plans on the sustainable management and use of water resources of the basins, efficiency and saving in water use, and efficiency in agricultural irrigation (Objective 2); sustainable use of agricultural lands, protection, rehabilitation and sustainable use of meadows and rangelands, and erosion control for prevention of destruction and erosion in basins and natural resources, rehabilitation and sustainable use of degraded basins (Objective 3); sustainable management of protected and sensitive areas in basins, and inventory and monitoring studies on biodiversity and ecosystem services to protect and manage the biodiversity of the basins, natural and cultural landscape resources and to ensure the sustainability of ecosystem services (Objective 4); large-scale integrated participatory basin rehabilitation projects to raise awareness of the people living in the basin, to increase their quality of life and welfare and to reduce the pressures on natural resources (Objective 5); incorporation of the possible effects of climate change and adaptation into basin management, and the development of adaptation and counter mechanisms (Objective 7.)
Turkey Agricultural Drought Strategy and Action Plan (2018-2022)	**Turkey Agricultural Drought Strategy and Action Plan does not mention the term "steppe" (*"bozkır" or "step", in Turkish*) and does not contain policies and measures directly associated with steppe ecosystems.** However, it aims to keep the effects of drought at a minimum by ensuring all necessary measures for the future in periods when drought does not occur with environmentally sustainable agricultural water use planning and implementing an effective intervention program during crises. Besides, measures to be determined in agricultural lands and rangelands contain supporting elements in terms of conservation and sustainable management of steppes within the scope of basic development axes, such as Drought Risk Estimation and Crisis Management, Ensuring Sustainable Water Supply, Effective Management of Agricultural Water Demand, Accelerating R&D Supports and Increasing Training/Extension Services and Developing Institutional Capacity.
Draft National Capacity Action Plan (2011)	**The National Capacity Action Plan includes cross-cutting issues and synergy areas for the effective implementation of three Rio Conventions (United Nations Framework Convention on Climate Change, Convention on Biological Diversity and Combat Desertification):** National and Sectoral Integration; Sustainable Land Management; Level of Vulnerability to Climate Change and Adaptation; Data Collection, Monitoring, Evaluation and Reporting; Research, Development, Education/Training and Technical Cooperation; Active Participation, Awareness Raising and Training of Stakeholders. Sustainable Land Management is presented as one of the most important tools for the sustainable management and rehabilitation of land resources, especially forest, agriculture, rangeland, wetland and steppe ecosystems, protection and development of soil and water resources, increased the carbon sequestration capacity of the soil, water and vegetation and the conservation of biodiversity. In this regard, developing a sustainable land management strategy and making legal arrangements, the realization of integrated and sustainable basin management, capacity building, and financing are prioritized.
Draft Turkey's National Protected Areas and Climate Change Strategy (2011)	In this strategy, establishing a "protected area system" of Turkey in the context of protected areas and climate change, establishing policies regarding the planning and management of protected areas, increased research, awareness raising, and information sharing are included as priority issues. The strategy is handled in three main groups: forest, wetland and steppe, and coastal ecosystems.

INSTITUTIONAL PLANS and PROGRAMS

Top Policy Document	Policies, Priorities and Objectives Related to Steppe Ecosystems
Ministry of Agriculture and Forestry Strategic Plan (2019-2023)	**The term "steppe" (*"bozkır" or "step", in Turkish*) does not appear in the Strategic Plan. However, the strategic plan includes objectives and targets that contribute to the conservation and management of steppe ecosystems related to increasing welfare in rural areas, increasing productivity and quality in agricultural production (A1) sustainable management of soil and water resources (A4); combating climate change, desertification and erosion (A5); and sustainable management of biodiversity (A6).** In this context, the following strategies and actions can be associated with steppe ecosystems: supporting organic and good agricultural practices in crop production; increasing biological and biotechnical control methods; dissemination of rangeland rehabilitation and management projects; increasing forage crop production; establishing an agricultural support model aimed at protecting the agricultural environment and natural resources; increasing environmental support and incentives (especially for women farmers) towards improvement of the quality of life in rural areas, ensuring that the rural areas are protected, livable and productive; disseminating pressurized irrigation systems; producing basin-based drought management plans; scaling-up the national land cover monitoring system; combating desertification/ land degradation and erosion; climate change adaptation and agricultural drought projects; erosion detection and control in agricultural lands and rangelands; legal regulation and awareness raising for recording and protecting genetic resources; establishing an effective protected area management and monitoring system, developing nature tourism and carrying out income generating activities for the local people; conducting surveys in vulnerable areas and designating new protected areas; bio-smuggling risk map modeling; recording and producing a database of traditional biodiversity-based information; training and awareness raising activities on game and hunting; drafting and monitoring species action plans by means of planning, production, and wild animal inventory studies in wildlife reserves, and establishment of rescue and rehabilitation centers.
General Directorate of Forestry Strategic Plan (2019-2023)	**The term "steppe" (*"bozkır" or "step", in Turkish*) does not appear in the Strategic Plan.** However, Strategic Plan includes the strategic objectives of effective protection of forest and forest resources from biotic and abiotic factors (A1); forestry development, increase in their efficiency and forest expansion (A2); ensuring that the society gains optimum benefits from forestry products and services (A3); and improving institutional capacity (A5). Conducting and scaling-up erosion control and rehabilitation works in rangelands in forests, forest edges and at the forest lines, which are used as rangelands but cannot be transformed into forest areas, are also targeted to prevent soil erosion and to reduce the pressure of animal grazing on forests (Objective 2.5).
3rd Agriculture and Forestry Council (2019)	The topics covered by the 3. Agriculture and Forestry Council Conclusion Declaration include the establishment of a support system that improves the structure of the agricultural sector and protects natural resources and the environment; completion of rangeland determination and delimitation studies, allocation of these to producers and producer organizations, development of plant seeds to be used in rangeland rehabilitation; dissemination of Smart Agricultural Practices; conservation, development and commercialization of ancestral (local) seed varieties; sustainable management of soil and water resources; determination, protection, improvement and dissemination of native genetic resources and biodiversity in agriculture and forestry; the determination, protection, development and monitoring of natural resources and biodiversity; setting up farming vocational training institutions and encouraging young people to receive trainings; production and use of organic and organomineral fertilizers, dissemination of biological and biotechnical control; effective and efficient management of desertification and erosion control activities. These topics support the conservation and sustainable management of steppe ecosystems.

ANNEX 2. Survey Results

NO	TITLE	GDPP			NCNP			GDL			GDF			GDARP		
		1.*	2.**	3.***	1.*	2.**	3.***	1.*	2.**	3.***	1.*	2.**	3.***	1.*	2.**	3.***
1	Conservation of important species	15	27	21	69	8	1	13	16	13	15	34	10	28	27	9
2	Conservation of plant genetic resources	41	27	9	35	20	9	2	14	30	11	35	7	46	24	2
3	Conservation of animal genetic resources	2	10	29	23	26	10	67	14	1	3	19	22	23	25	11
4	Conservation of vegetation	42	26	7	47	21	6	3	9	32	31	28	9	19	18	13
5	Conservation of rangelands/steppes in the forests or on forest edges	25	26	13	24	28	9	9	12	27	63	14	2	8	20	18
6	Conservation of plant species composition – Forage diversity	65	13	1	13	22	22	12	16	19	7	20	21	33	26	5
7	Conservation of plant species composition – Species diversity	47	21	8	37	13	11	2	12	25	18	26	13	26	28	9
8	Conservation of soil	31	24	10	16	29	13	2	9	26	52	15	8	25	18	5
9	Grazing planning	54	13	7	8	23	16	40	17	7	22	32	14	14	25	14
10	Determining the carrying capacity of rangelands	57	14	5	8	23	22	34	18	10	21	25	19	18	27	10
11	Determining the number and type of animals to graze	38	21	11	3	12	28	58	13	7	11	28	22	16	24	19
12	Allocation of rangelands (in forest regime, with important species)	58	11	9	8	19	24	20	18	11	31	31	12	13	20	13
13	Prevention of misuse (quarry, solar power plant, afforestation, etc.)	47	10	10	33	18	11	9	15	18	36	34	7	11	20	13
14	Research on improvement and rehabilitation of steppes or rangelands	45	25	7	22	24	14	14	21	15	21	32	16	47	16	5
15	Improvement and rehabilitation of steppes or rangelands	66	8	3	21	24	16	16	21	14	22	29	15	17	34	13

* In the assessment, the experts scored and prioritized the responsibilities of different institutions for different headings (1st priority, 2nd priority, and 3rd priority). In the table, total scores for all experts participating in the assessment are given.

ANNEX 3. Distribution of Data on the Area of Steppes, Steppe Forests, Registered Rangelands, Livestock Numbers, and Population in the Districts Within the Potential Steppe Zone

no	Name of the province	Name of the district	Overlap with the potential steppe zone (%)*	Area of steppes (ha)	Area of steppe forests (ha)	Area of registered rangelands (ha)**	Number of cattle***	Number of sheep and goats***	Population***
1	Adana	Pozantı	17	12,840	61	3,345	1,509	25,100	20,683
2	Adana	Tufanbeyli	18	8,491	371	1,775	14,111	18,930	17,667
3	Adıyaman	Besni	32	9,644	0	2,470	11,188	92,118	77,301
4	Adıyaman	Çelikhan	4	1,589	0	540	4,606	3,945	16,065
5	Adıyaman	Gerger	5	1,645	0	0	13,045	24,582	19,035
6	Adıyaman	Kahta	65	20,093	0	3,092	26,851	39,712	122,774
7	Adıyaman	Merkez	63	23,421	488	7,226	39,406	97,220	304,615
8	Adıyaman	Samsat	100	5,932	0	2,516	1,385	5,915	7,893
9	Adıyaman	Sincik	15	6,434	476	3,369	13,073	11,761	17,414
10	Adıyaman	Tut	13	3,085	0	37	4,821	8,517	10,161
11	Afyonkarahisar	Bolvadin	38	8,573	0	4,942	34,010	81,493	43,398
12	Afyonkarahisar	Çay	72	18,261	141	768	34,799	41,741	31,412
13	Afyonkarahisar	Çobanlar	34	1,379	0	1	11,150	35,875	14,503
14	Afyonkarahisar	Dinar	41	33,110	0	18	23,411	87,218	47,304
15	Afyonkarahisar	Emirdağ	65	36,362	0	10,151	15,074	154,358	37,817
16	Afyonkarahisar	Merkez	19	12,057	539	32	68,400	99,500	299,673
17	Afyonkarahisar	Sandıklı	1	1,418	0	0	31,229	49,492	56,182
18	Afyonkarahisar	Sinanpaşa	2	1,342	9	0	40,800	38,300	41,468
19	Afyonkarahisar	Şuhut	98	63,814	702	5	34,404	68,298	36,947
20	Afyonkarahisar	Sultandağı	87	35,210	0	4,851	7,976	51,540	15,076
21	Ağrı	Diyadin	100	97,234	0	941	14,986	259,622	42,123
22	Ağrı	Doğubayazıt	100	171,837	0	657	48,849	546,456	121,263
23	Ağrı	Eleşkirt	100	76,797	1,187	1,627	62,152	45,057	34,180
24	Ağrı	Hamur	100	57,066	0	334	43,226	67,281	19,115
25	Ağrı	Merkez	100	97,485	1,059	4,236	103,675	77,982	149,188
26	Ağrı	Patnos	99	53,884	0	753	36,145	201,713	122,833
27	Ağrı	Taşlıçay	100	56,303	0	1,296	24,132	69,208	20,450
28	Ağrı	Tutak	100	79,018	265	3,319	55,287	55,486	30,505
29	Aksaray	Ağaçören	100	8,642	0	2,458	6,517	28,020	8,320
30	Aksaray	Eskil	100	53,352	0	43,333	61,610	112,020	26,648
31	Aksaray	Gülağaç	100	8,652	0	492	8,621	26,439	19,903
32	Aksaray	Güzelyurt	100	9,628	173	3,805	6,342	21,873	11,761
33	Aksaray	Merkez	100	133,839	807	62,615	142,535	382,232	295,351
34	Aksaray	Ortaköy	100	22,122	0	7,356	21,802	55,704	32,504
35	Aksaray	Sarıyahşi	100	6,063	0	1,847	1,400	4,252	6,801
36	Aksaray	Sultanhanı	100	19,272	0	18,463	17,656	48,095	10,884

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37	Amasya	Göynücek	2	422	286	0	18,059	13,818	10,703
38	Ankara	Akyurt	100	11,791	847	1,820	33,159	9,903	34,588
39	Ankara	Altındağ	100	2,124	120	0	13,500	2,918	370,024
40	Ankara	Ayaş	100	44,800	584	3,054	19,520	85,014	15,540
41	Ankara	Bala	100	58,115	449	7,013	28,036	136,943	33,644
42	Ankara	Beypazarı	86	67,775	20,151	343	12,392	135,895	48,274
43	Ankara	Çankaya	100	21,856	1,346	410	9,576	38,754	920,890
44	Ankara	Çubuk	100	41,762	21,317	813	60,478	43,003	89,046
45	Ankara	Elmadağ	100	32,355	430	431	17,519	47,112	45,349
46	Ankara	Etimesgut	100	5,911	221	1,438	2,277	12,354	570,727
47	Ankara	Evren	100	5,115	0	87	2,730	5,327	3,606
48	Ankara	Gölbaşı	100	30,580	183	9,776	33,160	126,025	134,378
49	Ankara	Güdül	86	24,894	4,835	3,591	13,978	117,474	10,074
50	Ankara	Haymana	100	81,127	33	39,047	35,116	182,215	45,931
51	Ankara	Kahramankazan	100	14,431	3,088	1,873	17,471	26,934	53,522
52	Ankara	Kalecik	100	55,696	473	7,354	23,877	22,865	13,450
53	Ankara	Keçiören	100	5,390	486	710	3,666	5,552	909,787
54	Ankara	Kızılcahamam	36	32,409	7,437	25	25,992	38,943	32,647
55	Ankara	Mamak	100	10,575	57	12	11,472	11,310	647,252
56	Ankara	Nallıhan	25	33,221	81	1	9,287	83,904	28,091
57	Ankara	Polatlı	100	122,602	638	10,324	87,775	251,640	122,287
58	Ankara	Pursaklar	100	3,548	101	137	3,601	4,000	143,055
59	Ankara	Şereflikoçhisar	100	43,614	57	2,697	16,725	76,439	34,202
60	Ankara	Sincan	100	24,258	86	10,107	41,380	98,874	518,893
61	Ankara	Yenimahalle	100	5,527	11	1,193	2,516	8,082	663,580
62	Ardahan	Çıldır	98	63,125	2,095	41,370	39,643	29,096	9,833
63	Ardahan	Damal	100	9,237	137	3,894	18,580	140	5,802
64	Ardahan	Göle	65	52,722	440	31,876	93,325	16,750	25,187
65	Ardahan	Hanak	99	41,289	1,023	27,749	42,572	3,240	9,054
66	Ardahan	Merkez	92	68,391	3,110	42,842	95,633	24,000	42,226
67	Ardahan	Posof	5	2,716	0	1,981	17,172	1,012	6,805
68	Artvin	Ardanuç	13	12,834	42	5,505	9,483	45,458	12,056
69	Artvin	Şavşat	3	4,143	0	3,523	19,264	17,026	17,606
70	Artvin	Yusufeli	4	7,174	547	2,431	14,121	11,971	20,794
71	Batman	Beşiri	100	38,050	0	7,498	6,866	190,302	30,445
72	Batman	Gercüş	100	71,527	0	751	4,514	60,708	20,484
73	Batman	Hasankeyf	100	27,979	0	1,030	1,424	17,797	6,724
74	Batman	Kozluk	60	38,722	0	318	41,080	136,203	61,437
75	Batman	Merkez	100	30,889	0	10,314	24,171	357,843	447,106
76	Batman	Sason	26	15,591	0	0	29,729	57,302	32,907
77	Bayburt	Aydıntepe	80	28,270	347	10,558	9,666	6,067	6,984
78	Bayburt	Demirözü	100	32,041	1,211	4,313	18,984	6,584	8,657

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79	Bayburt	Merkez	99	173,633	11,446	59,746	69,410	36,136	66,633
80	Bingöl	Genç	3	3,314	26	0	20,493	33,591	38,428
81	Bitlis	Adilcevaz	76	12,310	0	8,949	8,264	107,465	30,376
82	Bitlis	Ahlat	14	2,451	0	667	11,964	105,651	40,806
83	Bitlis	Tatvan	46	2,857	1,077	596	10,388	97,147	92,695
84	Çankırı	Çerkeş	1	1,109	0	832	35,404	9,900	18,694
85	Çankırı	Eldivan	100	18,563	4,240	4,123	3,300	8,738	7,588
86	Çankırı	Ilgaz	8	4,822	1,351	844	10,150	11,839	14,891
87	Çankırı	Kızılırmak	100	16,691	0	12,383	13,480	10,900	8,220
88	Çankırı	Korgun	100	28,616	3,964	7,157	8,912	4,007	5,666
89	Çankırı	Kurşunlu	39	19,054	2,351	8,004	12,367	7,829	10,307
90	Çankırı	Merkez	100	74,463	792	32,434	15,843	49,020	96,025
91	Çankırı	Orta	92	43,196	3,886	17,618	25,230	8,440	20,439
92	Çankırı	Şabanözü	100	24,546	3,171	6,025	12,149	5,677	14,080
93	Çankırı	Yapraklı	97	33,037	14,914	4,973	5,533	6,665	8,981
94	Çorum	Alaca	100	25,850	8,040	3,391	24,429	15,398	31,460
95	Çorum	Bayat	99	28,698	8,447	4,832	13,442	12,509	16,525
96	Çorum	Boğazkale	100	5,882	7,845	227	4,507	4,427	4,175
97	Çorum	Dodurga	35	3,347	1,440	7	2,498	2,700	6,368
98	Çorum	İskilip	51	21,802	7,868	2,683	24,500	16,210	32,546
99	Çorum	Laçin	19	1,806	863	53	5,600	9,194	4,770
100	Çorum	Mecitözü	2	207	544	134	25,314	19,985	15,655
101	Çorum	Merkez	85	68,950	34,568	14,117	53,951	44,100	294,807
102	Çorum	Oğuzlar	98	4,094	1,755	135	3,574	0	5,483
103	Çorum	Ortaköy	6	190	163	82	5,352	6,206	8,696
104	Çorum	Sungurlu	100	64,082	12,401	8,062	36,487	45,410	49,082
105	Çorum	Uğurludağ	100	17,027	4,421	1,619	7,624	9,141	8,252
106	Diyarbakır	Bağlar	100	23,961	0	16,307	55,516	239,822	388,387
107	Diyarbakır	Bismil	100	17,197	0	6,807	27,419	97,160	117,674
108	Diyarbakır	Çermik	96	62,031	20	7,660	36,061	350,125	50,812
109	Diyarbakır	Çınar	100	115,448	1	22,327	58,054	372,756	74,207
110	Diyarbakır	Çüngüş	62	27,410	259	4,691	4,035	10,100	11,927
111	Diyarbakır	Dicle	100	56,119	1,466	1,044	22,067	30,560	38,220
112	Diyarbakır	Eğil	100	33,134	0	6,919	16,052	60,527	23,369
113	Diyarbakır	Ergani	100	90,047	15	31,301	57,940	259,172	130,105
114	Diyarbakır	Hani	94	30,701	290	657	17,203	24,642	33,100
115	Diyarbakır	Hazro	100	21,811	1,012	1,884	20,391	13,405	16,935
116	Diyarbakır	Kayapınar	100	21,609	0	10,427	27,025	128,885	362,407
117	Diyarbakır	Kocaköy	100	9,840	195	151	18,732	12,578	16,679
118	Diyarbakır	Kulp	43	55,854	924	75	56,030	55,000	36,640
119	Diyarbakır	Lice	64	40,759	2,836	288	45,201	48,918	26,163
120	Diyarbakır	Silvan	100	40,786	710	2,780	75,283	62,157	86,672

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121	Diyarbakır	Sur	100	12,444	0	3,166	31,333	26,451	112,306
122	Diyarbakır	Yenişehir	100	8,536	0	4,185	21,120	42,381	206,793
123	Elazığ	Ağın	100	13,671	0	1	796	10,622	2,776
124	Elazığ	Alacakaya	73	20,063	52	0	3,338	8,068	6,566
125	Elazığ	Arıcak	53	14,369	924	0	10,238	10,389	17,028
126	Elazığ	Baskil	100	93,685	287	9,102	5,617	9,078	20,505
127	Elazığ	Karakoçan	11	4,934	0	0	35,662	60,856	28,702
128	Elazığ	Keban	100	51,530	40	16,364	1,990	20,952	8,409
129	Elazığ	Kovancılar	76	46,330	9	974	38,845	166,143	38,774
130	Elazığ	Maden	100	68,677	750	382	5,365	8,927	16,608
131	Elazığ	Merkez	100	106,277	857	34,346	69,671	343,520	421,726
132	Elazığ	Palu	34	15,734	315	15	9,450	28,700	23,834
133	Elazığ	Sivrice	100	55,395	208	7,118	6,446	31,490	10,710
134	Erzincan	Çayırlı	65	44,525	769	19,362	12,066	29,025	9,032
135	Erzincan	İliç	97	121,219	4,036	46,014	1,870	46,475	8,922
136	Erzincan	Kemah	69	141,070	4,695	61,485	2,577	57,754	8,167
137	Erzincan	Kemaliye	73	83,313	173	25,224	1,529	36,623	5,555
138	Erzincan	Merkez	71	65,569	1,173	21,384	42,044	107,983	157,452
139	Erzincan	Otlukbeli	100	25,753	818	10,884	5,705	5,043	2,437
140	Erzincan	Refahiye	42	53,063	8,121	15,395	11,288	6,883	12,456
141	Erzincan	Tercan	61	52,327	1,531	16,011	28,851	101,353	17,623
142	Erzincan	Üzümlü	20	5,102	51	1,994	8,985	43,318	14,390
143	Erzurum	Aşkale	80	67,475	5,749	28,438	34,093	16,005	23,589
144	Erzurum	Aziziye	74	60,959	1,620	17,685	47,258	11,669	62,289
145	Erzurum	Hınıs	57	41,341	1,212	16,162	41,858	98,059	26,865
146	Erzurum	Horasan	100	83,750	1,935	38,521	64,567	27,736	39,445
147	Erzurum	İspir	31	63,313	1,282	46,546	21,900	11,034	15,898
148	Erzurum	Karaçoban	88	23,124	0	13,685	40,806	58,690	23,246
149	Erzurum	Karayazı	100	147,527	1,785	51,593	62,700	76,402	28,502
150	Erzurum	Köprüköy	100	34,713	2,319	13,293	43,168	22,703	16,178
151	Erzurum	Narman	100	52,328	3,317	26,220	36,315	4,207	13,381
152	Erzurum	Oltu	28	34,829	435	11,878	23,481	22,003	30,966
153	Erzurum	Olur	39	30,363	652	19,548	15,484	9,336	6,715
154	Erzurum	Palandöken	44	18,174	544	5,231	22,881	10,366	168,651
155	Erzurum	Pasinler	92	53,576	5,364	23,756	65,367	46,912	28,961
156	Erzurum	Pazaryolu	95	53,983	943	36,834	4,911	6,065	4,501
157	Erzurum	Şenkaya	29	33,590	671	17,612	54,610	40,302	18,281
158	Erzurum	Tekman	60	91,710	217	44,835	62,428	172,999	25,969

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159	Erzurum	Tortum	69	86,936	2,226	56,948	35,555	17,246	17,054
160	Erzurum	Uzundere	14	5,787	76	1,838	2,656	14,114	8,744
161	Erzurum	Yakutiye	100	60,018	288	38,804	42,046	18,608	191,224
162	Eskişehir	Alpu	53	15,318	0	10,812	23,274	64,231	11,242
163	Eskişehir	Beylikova	94	35,198	0	24,445	8,658	39,826	6,953
164	Eskişehir	Çifteler	89	10,411	0	3,179	6,838	67,195	15,098
165	Eskişehir	Günyüzü	100	47,014	49	22,476	2,136	47,027	6,127
166	Eskişehir	Mahmudiye	100	13,146	0	9,811	11,873	37,142	7,998
167	Eskişehir	Mihalıççık	40	47,003	1,551	10,890	7,839	81,626	8,526
168	Eskişehir	Odunpazarı	58	23,460	762	9,748	24,359	55,384	404,267
169	Eskişehir	Seyitgazi	16	4,092	0	681	16,560	72,927	13,405
170	Eskişehir	Sivrihisar	100	120,011	947	41,648	11,484	198,917	20,746
171	Eskişehir	Tepebaşı	29	4,553	34	2,339	31,573	84,114	359,303
172	Gaziantep	Araban	61	10,542	0	2,597	8,779	60,001	32,846
173	Gaziantep	Karkamış	100	1,292	0	441	3,919	5,232	10,436
174	Gaziantep	Nizip	62	10,499	0	2,017	70,429	18,032	142,389
175	Gaziantep	Oğuzeli	71	2,870	0	1,074	58,419	77,647	32,653
176	Gaziantep	Şahinbey	10	2,436	0	1,491	33,467	82,435	906,043
177	Gaziantep	Yavuzeli	30	6,223	0	2,171	13,035	67,548	22,192
178	Giresun	Alucra	4	2,229	752	584	6,353	5,725	12,250
179	Giresun	Çamoluk	100	25,037	6,233	2,123	2,895	2,413	9,759
180	Giresun	Şebinkarahisar	7	6,717	139	2,001	27,515	26,856	21,814
181	Gümüşhane	Kelkit	96	86,985	18,567	13,923	33,450	10,849	47,891
182	Gümüşhane	Köse	97	15,504	3,166	3,494	6,738	1,560	9,387
183	Gümüşhane	Merkez	4	5,114	1,218	756	8,650	10,631	57,269
184	Gümüşhane	Şiran	95	43,235	20,192	4,236	16,861	9,120	20,084
185	Hakkari	Merkez	4	7,138	0	1,772	4,568	186,356	81,424
186	Hakkari	Yüksekova	67	144,016	0	61,438	28,113	361,834	119,760
187	Iğdır	Aralık	99	66,286	0	9,703	25,207	189,384	21,311
188	Iğdır	Karakoyunlu	99	10,957	0	5,631	20,122	110,046	13,972
189	Iğdır	Merkez	100	90,915	0	34,630	64,834	547,422	137,613
190	Iğdır	Tuzluca	100	96,121	84	32,379	40,470	181,470	24,560
191	Isparta	Uluborlu	1	248	0	0	1,827	15,013	6,388
192	Kahramanmaraş	Afşin	96	87,078	436	22,345	33,302	61,000	81,423
193	Kahramanmaraş	Ekinözü	32	13,282	143	4,601	7,740	11,936	11,839
194	Kahramanmaraş	Elbistan	100	137,438	0	85,814	38,527	69,700	142,548
195	Kahramanmaraş	Göksun	8	12,653	0	3,155	19,518	62,185	55,985
196	Kahramanmaraş	Nurhak	26	24,178	0	14,880	2,330	32,229	12,592

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197	Kahramanmaraş	Pazarcık	1	916	0	500	12,005	197,313	68,838
198	Karaman	Ayrancı	99	175,566	0	84,068	7,864	243,211	8,338
199	Karaman	Kazımkarabekir	100	13,809	14	1,725	3,897	20,538	4,407
200	Karaman	Merkez	82	182,594	613	62,695	45,218	329,109	194,018
201	Kars	Akyaka	99	13,330	0	2,886	35,060	13,000	10,985
202	Kars	Arpaçay	100	63,039	0	9,954	57,000	61,500	17,373
203	Kars	Digor	100	60,145	0	3,156	48,000	80,000	22,282
204	Kars	Kağızman	100	136,946	3,087	3,063	45,000	159,000	45,936
205	Kars	Merkez	100	85,745	0	15,651	110,030	70,000	115,891
206	Kars	Sarıkamış	66	74,434	1,689	10,408	61,001	35,000	42,683
207	Kars	Selim	95	43,147	0	8,587	59,010	25,000	23,231
208	Kars	Susuz	100	28,419	219	4,965	35,000	13,000	10,497
209	Kayseri	Akkışla	100	22,899	54	17,484	7,904	83,660	6,429
210	Kayseri	Bünyan	100	49,271	12	36,214	34,532	45,463	31,497
211	Kayseri	Develi	75	62,800	2,907	26,024	51,348	63,850	65,322
212	Kayseri	Felahiye	100	19,551	23	6,071	4,584	15,010	6,602
213	Kayseri	Hacılar	100	12,165	362	2,472	5,729	8,310	12,426
214	Kayseri	İncesu	100	58,362	391	17,383	20,196	47,814	26,353
215	Kayseri	Kocasinan	100	53,728	0	11,180	61,345	59,400	391,661
216	Kayseri	Melikgazi	100	27,480	518	6,709	26,183	15,490	555,671
217	Kayseri	Özvatan	100	17,120	6	6,961	2,063	7,490	5,413
218	Kayseri	Pınarbaşı	100	198,320	235	65,577	32,047	111,506	26,911
219	Kayseri	Sarıoğlan	100	22,468	46	13,270	16,818	13,827	16,938
220	Kayseri	Sarız	94	92,580	845	50,469	16,475	16,872	10,098
221	Kayseri	Talas	100	12,804	88	5,394	12,846	18,343	157,695
222	Kayseri	Tomarza	100	79,794	1,289	38,519	26,138	27,944	22,808
223	Kayseri	Yahyalı	22	20,751	156	8,402	20,762	72,161	36,331
224	Kayseri	Yeşilhisar	100	48,890	0	29,886	10,726	39,953	17,525
225	Kilis	Elbeyli	100	2,803	0	713	1,664	19,602	6,526
226	Kilis	Merkez	50	4,330	0	1,337	7,034	90,330	116,034
227	Kilis	Polateli	2	118	0	72	1,931	51,787	5,361
228	Kırıkkale	Bahşili	100	13,337	1,235	557	1,272	5,246	7,907
229	Kırıkkale	Balışeyh	100	13,883	1,628	1,700	9,415	13,145	7,221
230	Kırıkkale	Çelebi	100	7,334	0	3,540	2,715	7,695	3,024
231	Kırıkkale	Delice	100	32,981	2,007	7,078	7,053	20,996	10,017
232	Kırıkkale	Karakeçili	100	1,960	0	499	3,758	5,954	3,810
233	Kırıkkale	Keskin	100	45,269	664	19,615	28,079	32,876	18,139
234	Kırıkkale	Merkez	100	20,570	261	2,114	11,676	17,638	196,645
235	Kırıkkale	Sulakyurt	100	35,494	3,170	4,194	4,413	17,800	8,531

no	Name of the province	Name of the district	Overlap with the potential steppe zone (%)*	Area of steppes (ha)	Area of steppe forests (ha)	Area of registered rangelands (ha)**	Number of cattle***	Number of sheep and goats***	Population***
236	Kırıkkale	Yahşihan	100	24,350	1	2,366	4,835	13,752	31,308
237	Kırşehir	Akçakent	100	15,821	3,997	1,001	8,805	11,380	4,229
238	Kırşehir	Akpınar	100	24,445	0	4,576	9,819	18,548	7,826
239	Kırşehir	Boztepe	100	17,738	0	4,923	35,310	15,970	5,581
240	Kırşehir	Çiçekdağı	100	34,281	2,344	6,336	21,080	46,383	14,735
241	Kırşehir	Kaman	100	40,487	198	16,760	25,111	52,200	37,223
242	Kırşehir	Merkez	100	71,594	20	28,276	99,595	102,217	153,511
243	Kırşehir	Mucur	100	30,533	0	7,652	23,425	30,472	18,763
244	Konya	Ahırlı	40	5,541	721	34	7,405	20,000	5,084
245	Konya	Akören	100	41,240	2,654	2,159	6,791	23,333	5,879
246	Konya	Akşehir	64	5,169	26	2,564	34,605	31,150	93,233
247	Konya	Altınekin	100	39,032	0	28,152	13,512	63,361	14,548
248	Konya	Beyşehir	39	35,629	3,314	1,828	34,510	33,300	73,768
249	Konya	Bozkır	35	22,932	2,437	0	11,605	30,600	26,287
250	Konya	Çeltik	100	11,405	0	5,245	3,179	32,408	10,071
251	Konya	Cihanbeyli	100	92,939	0	45,561	42,430	165,675	52,525
252	Konya	Çumra	100	59,449	622	23,726	90,876	147,806	66,794
253	Konya	Derbent	100	17,397	4,938	1,549	4,761	5,346	4,455
254	Konya	Doğanhisar	42	915	784	0	9,373	9,051	16,029
255	Konya	Emirgazi	100	28,893	9	13,534	30,054	85,803	8,949
256	Konya	Ereğli	100	104,135	0	53,776	169,501	189,071	145,389
257	Konya	Güneysınır	87	27,944	605	1,251	8,050	25,377	9,458
258	Konya	Halkapınar	99	53,081	514	21,504	6,849	18,082	4,354
259	Konya	Ilgın	97	59,725	10,511	13,992	40,045	91,319	54,622
260	Konya	Kadınhanı	100	44,040	1,187	24,478	34,531	110,300	33,036
261	Konya	Karapınar	100	141,265	120	121,625	75,632	318,279	49,766
262	Konya	Karatay	100	101,362	0	76,669	79,479	183,800	323,659
263	Konya	Kulu	100	44,399	0	11,295	22,998	116,998	50,667
264	Konya	Meram	100	111,537	8,728	12,392	82,175	139,757	342,315
265	Konya	Sarayönü	100	49,478	1,053	30,395	28,800	89,060	26,875
266	Konya	Selçuklu	100	104,545	856	30,916	13,348	101,530	648,850
267	Konya	Seydişehir	74	58,196	10,655	3,861	31,491	54,189	64,687
268	Konya	Tuzlukçu	100	22,139	0	5,468	10,252	24,888	7,280
269	Konya	Yalıhüyük	96	456	0	0	660	650	1,785
270	Konya	Yunak	100	70,179	0	19,932	14,402	65,997	23,093
271	Malatya	Akçadağ	100	71,469	911	24,851	18,137	24,687	35,359
272	Malatya	Arapgir	100	80,604	3,293	7,542	5,391	59,329	10,868
273	Malatya	Arguvan	100	69,590	2,124	17,960	8,270	44,989	8,157

no	Name of the province	Name of the district	Overlap with the potential steppe zone (%)*	Area of steppes (ha)	Area of steppe forests (ha)	Area of registered rangelands (ha)**	Number of cattle***	Number of sheep and goats***	Population***
274	Malatya	Battalgazi	100	58,452	1,168	6,849	44,318	18,390	295,821
275	Malatya	Darende	100	112,711	0	10,670	7,586	33,605	29,045
276	Malatya	Doğanşehir	39	36,100	1,050	7,333	10,985	39,850	39,454
277	Malatya	Doğanyol	66	7,212	398	2,104	3,406	557	4,420
278	Malatya	Hekimhan	100	118,058	516	9,714	8,163	18,935	22,867
279	Malatya	Kale	100	14,886	472	4,698	2,378	48	6,100
280	Malatya	Kuluncak	100	47,489	183	10,519	4,763	17,145	8,384
281	Malatya	Pütürge	58	48,890	5,905	9,189	9,824	5,666	15,049
282	Malatya	Yazıhan	100	27,720	28	5,604	17,180	25,560	16,673
283	Malatya	Yeşilyurt	88	48,219	226	16,567	33,920	49,672	304,839
284	Mardin	Artuklu	100	50,265	0	11,433	6,192	107,873	174,731
285	Mardin	Dargeçit	100	46,904	0	173	7,789	46,959	28,555
286	Mardin	Derik	100	72,858	0	19,492	56,600	317,065	61,830
287	Mardin	Kızıltepe	100	18,404	0	4,735	8,603	77,147	252,656
288	Mardin	Mazıdağı	100	63,831	8	969	8,114	132,422	35,757
289	Mardin	Midyat	100	95,047	0	1,453	12,726	66,572	113,367
290	Mardin	Nusaybin	100	73,729	0	405	6,958	81,981	105,856
291	Mardin	Ömerli	100	34,750	1	0	2,363	27,244	14,233
292	Mardin	Savur	100	78,397	0	499	6,273	78,949	27,304
293	Mardin	Yeşilli	100	12,638	1	577	1,207	39,270	14,906
294	Mersin	Çamlıyayla	3	1,770	0	0	2,000	49,301	8,679
295	Mersin	Erdemli	10	23,189	0	6,243	7,360	225,000	140,331
296	Mersin	Mut	3	7,706	0	560	20,100	181,238	62,853
297	Mersin	Silifke	3	7,467	0	1,129	11,476	163,215	119,303
298	Muş	Bulanık	32	12,399	0	1,323	103,445	143,186	80,540
299	Muş	Malazgirt	92	50,804	9	1,581	64,892	41,394	51,323
300	Nevşehir	Acıgöl	100	15,891	0	3,734	10,319	8,500	19,561
301	Nevşehir	Avanos	100	37,531	0	13,087	16,811	24,233	32,618
302	Nevşehir	Derinkuyu	100	14,230	0	7,125	14,043	13,389	20,786
303	Nevşehir	Gülşehir	100	31,517	344	14,226	13,296	41,378	21,771
304	Nevşehir	Hacıbektaş	100	18,147	211	10,217	9,258	16,105	11,487
305	Nevşehir	Kozaklı	100	20,989	0	10,758	9,553	14,066	13,570
306	Nevşehir	Merkez	100	15,474	1	3,789	11,019	16,500	143,194
307	Nevşehir	Ürgüp	100	30,568	0	7,630	6,384	11,799	35,352
308	Niğde	Altunhisar	100	36,613	78	5,973	9,088	51,040	15,463
309	Niğde	Bor	100	92,496	0	32,927	43,186	121,031	60,335
310	Niğde	Çamardı	85	80,445	124	23,185	5,517	65,826	13,200
311	Niğde	Çiftlik	100	26,832	1,105	7,715	14,200	48,678	28,168

no	Name of the province	Name of the district	Overlap with the potential steppe zone (%)*	Area of steppes (ha)	Area of steppe forests (ha)	Area of registered rangelands (ha)**	Number of cattle***	Number of sheep and goats***	Population***
312	Niğde	Merkez	100	108,168	344	48,722	94,316	207,507	224,289
313	Niğde	Ulukışla	66	64,521	286	4,488	6,170	78,887	23,252
314	Rize	İkizdere	3	2,238	0	847	3,061	2,179	9,809
315	Şanlıurfa	Akçakale	99	23,638	0	10,847	20,130	80,970	113,194
316	Şanlıurfa	Birecik	100	20,037	0	928	14,473	41,093	95,149
317	Şanlıurfa	Bozova	100	44,760	704	9,284	13,725	31,281	58,565
318	Şanlıurfa	Ceylanpınar	100	50,368	0	6,556	19,775	209,955	87,684
319	Şanlıurfa	Eyyübiye	100	95,249	0	22,677	28,776	118,955	379,123
320	Şanlıurfa	Halfeti	100	31,187	0	560	12,330	31,120	41,142
321	Şanlıurfa	Haliliye	100	95,659	418	47,557	31,978	152,402	376,251
322	Şanlıurfa	Harran	100	23,931	0	7,476	6,865	46,427	87,843
323	Şanlıurfa	Hilvan	100	32,177	0	15,163	14,193	111,149	42,829
324	Şanlıurfa	Karaköprü	100	37,697	439	17,752	8,561	45,927	195,552
325	Şanlıurfa	Siverek	100	193,449	147	66,482	89,696	806,130	258,265
326	Şanlıurfa	Suruç	100	11,024	0	5,308	8,324	19,475	104,302
327	Şanlıurfa	Viranşehir	100	98,294	0	60,806	83,258	453,780	195,910
328	Siirt	Baykan	33	15,933	1	314	7,346	109,045	26,160
329	Siirt	Eruh	14	12,509	16	173	3,000	117,118	20,513
330	Siirt	Kurtalan	100	41,400	0	12,803	5,835	118,000	59,647
331	Siirt	Merkez	47	22,357	7	2,529	4,386	528,723	166,332
332	Şırnak	Cizre	76	18,956	0	2,949	15,411	200,291	143,124
333	Şırnak	Güçlükonak	56	23,339	0	0	2,051	111,100	13,091
334	Şırnak	İdil	100	77,914	0	7,933	32,216	325,340	76,523
335	Sivas	Akıncılar	28	7,158	717	1,423	4,530	1,387	5,675
336	Sivas	Altınyayla	100	32,202	0	17,636	12,366	39,424	9,309
337	Sivas	Divriği	100	228,720	2,733	40,441	9,973	47,018	16,377
338	Sivas	Gemerek	92	59,281	666	25,451	22,135	45,137	24,828
339	Sivas	Gölova	88	14,000	988	3,645	5,333	2,843	4,176
340	Sivas	Gürün	100	218,063	19	137,857	17,100	109,000	19,076
341	Sivas	Hafik	79	89,894	2,219	36,087	17,894	14,630	10,062
342	Sivas	İmranlı	93	96,546	7,449	36,145	8,319	3,128	8,249
343	Sivas	Kangal	100	203,604	420	132,541	17,170	67,259	21,669
344	Sivas	Koyulhisar	1	938	0	511	11,602	8,481	14,613
345	Sivas	Merkez	96	196,733	1,915	90,678	78,057	59,959	377,561
346	Sivas	Şarkışla	94	99,053	919	35,526	39,458	46,941	38,954
347	Sivas	Suşehri	23	13,619	3,274	7,391	19,495	16,833	25,654
348	Sivas	Ulaş	100	57,976	459	25,078	13,047	47,988	9,682
349	Sivas	Yıldızeli	57	71,925	3,220	28,604	50,936	59,639	33,986
350	Sivas	Zara	83	151,004	11,965	52,831	26,684	8,769	23,336

no	Name of the province	Name of the district	Overlap with the potential steppe zone (%)*	Area of steppes (ha)	Area of steppe forests (ha)	Area of registered rangelands (ha)**	Number of cattle***	Number of sheep and goats***	Population***
351	Tokat	Artova	63	11,259	2,645	1,595	13,206	10,700	8,744
352	Tokat	Merkez	9	7,247	281	2,432	59,627	79,500	201,294
353	Tokat	Sulusaray	91	9,134	1,640	974	11,052	7,112	7,401
354	Tokat	Yeşilyurt	36	2,337	541	88	13,969	7,783	9,154
355	Tokat	Zile	41	19,421	6,048	3,527	47,223	43,435	55,673
356	Tunceli	Çemişgezek	43	11,296	0	904	4,173	125,412	8,347
357	Tunceli	Mazgirt	23	9,313	0	210	6,409	43,256	8,430
358	Tunceli	Pertek	38	23,531	0	2,625	5,503	128,639	11,669
359	Van	Başkale	98	231,868	0	174,307	13,240	313,635	52,544
360	Van	Çaldıran	100	121,008	0	73,876	6,563	224,007	63,013
361	Van	Çatak	25	46,675	129	32,084	2,004	134,394	20,937
362	Van	Edremit	100	19,975	0	17,526	11,024	88,962	125,884
363	Van	Erciş	100	137,926	0	106,526	37,960	317,020	173,313
364	Van	Gevaş	52	8,499	185	5,877	9,100	82,120	28,620
365	Van	Gürpınar	99	363,768	0	290,656	8,721	643,595	35,663
366	Van	İpekyolu	100	64,507	0	57,681	18,000	154,101	312,244
367	Van	Muradiye	100	71,299	0	58,176	21,752	169,784	49,688
368	Van	Özalp	100	102,270	0	95,073	8,903	236,645	65,785
369	Van	Saray	100	72,575	0	66,108	3,074	165,950	20,949
370	Van	Tuşba	100	60,215	0	49,041	33,000	80,026	160,522
371	Yozgat	Akdağmadeni	50	41,122	13,324	1,341	36,051	40,863	42,919
372	Yozgat	Aydıncık	89	7,537	7,901	299	8,341	6,762	10,407
373	Yozgat	Boğazlıyan	100	28,915	0	5,221	14,406	66,174	34,121
374	Yozgat	Çandır	100	5,394	0	542	2,081	6,151	4,597
375	Yozgat	Çayıralan	44	15,812	4,496	1,404	7,445	13,238	13,512
376	Yozgat	Çekerek	100	34,053	16,107	227	25,943	17,953	19,786
377	Yozgat	Kadışehri	96	16,680	4,553	1,046	19,199	9,365	11,716
378	Yozgat	Merkez	100	79,758	7,023	39,793	35,506	52,000	105,167
379	Yozgat	Saraykent	100	10,663	6,285	419	9,462	2,654	14,198
380	Yozgat	Sarıkaya	99	18,602	2,494	4,501	23,778	23,911	33,010
381	Yozgat	Şefaatli	100	15,291	1	10,494	9,301	25,010	15,135
382	Yozgat	Sorgun	100	36,192	9,286	2,830	32,895	35,217	79,314
383	Yozgat	Yenifakılı	100	11,485	0	854	3,611	20,000	5,538
384	Yozgat	Yerköy	100	42,897	2,161	5,494	19,790	59,500	35,561

The provinces where the overlap of the area of the district with the potential steppe zone is <50% are marked in gray. The provinces are not shown when the overlap is lower than 1%.

** *The area of the registered rangelands within the potential steppe zone in the province is given. Registered rangeland data are up to date and indicate numbers as of April.*

*** *TÜİK 2018 data were used for population and animal statistics.*

ANNEX 4. Experts Who Contributed to the Strategy Preparation

no	Name	Institution / Unit	Province
1	Selami Işık	Governorship of Şanlıurfa Deputy Governor	Şanlıurfa
2	Mustafa Bulut	General Directorate of Nature Conservation and National Parks Deputy Director General	Ankara
3	Suat Yılmaz	General Directorate of Plant Production Deputy Director General	Ankara
4	Ahmet Dallı	General Directorate of Plant Production Deputy Director General	Ankara
5	Mehmet Çelik	General Directorate of Forestry Deputy Director General	Ankara
6	İsrafil Erdoğan	Ministry of Forestry and Water Affairs 3rd Regional Director	Şanlıurfa
7	Murat Akgün	Ministry of Forestry and Water Affairs 3rd Regional Deputy Director	Şanlıurfa
8	Adil Uztemur	3rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
9	Ahmet İlker Eken	3rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
10	Ahmet Ziya Evren	3rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
11	Asiye Şahbaz	3rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
12	Burak Aynur	3rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
13	Fecir Örnek	Şanlıurfa Provincial Branch	Şanlıurfa
14	Ecrin Kapucu	3rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
15	Fatime Şelale	3rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
16	Gülcihan Karaca Aynur	3rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
17	Halil Haspolat	3rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
18	Mehmet Ekinci	3rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa

no	Name	Institution / Unit	Province
19	Mehmet Emin Saygan	3rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
20	Mehmet Gürkaynak	3rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
21	Reşat Ektiren	3rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
22	Sait Ceylan	3rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
23	Samed Aksungur	3rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
24	Soner Gelici	3rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
25	Suat Tekin	3rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
26	Ziya Atcı	3rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
27	Ziya Aygün	3rd Regional Directorate Şanlıurfa Provincial Branch	Şanlıurfa
28	Ömür Aybike Yıldırım	Locally based Project Assistant - FAO Şanlıurfa Office	Şanlıurfa
29	Adnan Yetkin	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
30	Aziz Aktacir	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
31	Murat Çakmak	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
32	Fatma Akgün	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
33	Fevzi Seymen	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
34	Halil Harem	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
35	Halil Nimetoğlu	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
36	Halil Şıtıl	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
37	Mehmet Gözoğlu	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
38	Mehmet Tanrıverdi	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
39	Mehmet Sait Yıldız	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
40	Melda Akil	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
41	Ramazan Bozdağ	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
42	Süleyman Şeker	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
43	Süleyman Tüzün	Şanlıurfa Provincial Directorate of Agriculture and Forestry	Şanlıurfa
44	Sabri Tutuş	Şanlıurfa Provincial Directorate of Agriculture and Forestry Halfeti District Directorate of Agriculture and Forestry	Şanlıurfa

no	Name	Institution / Unit	Province
45	Sıraç Yolcu	Şanlıurfa Provincial Directorate of Agriculture and Forestry Halfeti District Directorate of Agriculture and Forestry	Şanlıurfa
46	Murat Yahlizade	Şanlıurfa Provincial Directorate of Agriculture and Forestry Suruç District Directorate of Agriculture and Forestry	Şanlıurfa
47	M. Akan Akmeşe	Şanlıurfa Provincial Directorate of Agriculture and Forestry Viranşehir District Directorate of Agriculture and Forestry	Şanlıurfa
48	Sezer Mecu	Şanlıurfa Provincial Directorate of Agriculture and Forestry Viranşehir District Directorate of Agriculture and Forestry	Şanlıurfa
49	Cevdet Çiçek	Şanlıurfa Regional Directorate of Forestry	Şanlıurfa
50	Mehmet Taşan	Şanlıurfa Regional Directorate of Forestry	Şanlıurfa
51	Murat Tuncer	Şanlıurfa Regional Directorate of Forestry	Şanlıurfa
52	Şevket Tepe	Şanlıurfa Regional Directorate of Forestry	Şanlıurfa
53	Mehmet Yavuz	GAP Administration	Şanlıurfa
54	Neslihan Aktaş	GAP Administration	Şanlıurfa
55	Ali İlkhan	GAP Agricultural Research Institute	Şanlıurfa
56	Halil Hatipoğlu	GAP Agricultural Research Institute	Şanlıurfa
57	İbrahim Halil Çetiner	GAP Agricultural Research Institute	Şanlıurfa
58	Murat Tarini	GAP Agricultural Research Institute	Şanlıurfa
59	Adem Ekinci	Şanlıurfa Provincial Directorate of Environment and Urbanism	Şanlıurfa
60	Ayşe Kader Polat	Şanlıurfa Provincial Directorate of Environment and Urbanism	Şanlıurfa
61	Mehmet Kasım Ermiş	Şanlıurfa Provincial Gendarmerie Command	Şanlıurfa
62	Aydın Aslan	Şanlıurfa Provincial Directorate of Culture and Tourism	Şanlıurfa
63	Aykut Hakan Kutluhan	Şanlıurfa Provincial Directorate of Culture and Tourism	Şanlıurfa
64	İ. Etem Kapici	Şanlıurfa Provincial Directorate of Culture and Tourism Department of Cultural and Natural Assets	Şanlıurfa
65	ismail Uğur Hatipoğlu	Şanlıurfa Provincial Directorate of National Education	Şanlıurfa
66	Faik Yüksekyayla	Şanlıurfa Metropolitan Municipality - Survey and Projects Department	Şanlıurfa
67	Sümeyye Kırıkçı	Şanlıurfa Metropolitan Municipality – Survey and Projects Department	Şanlıurfa
68	Fatma Abak	Şanlıurfa Metropolitan Municipality - Women and Family Department	Şanlıurfa
69	Leyla Duşak	Şanlıurfa Metropolitan Municipality – Women and Family Department	Şanlıurfa
70	Gülçin Baytur	Şanlıurfa Metropolitan Municipality - Parks and Gardens Department	Şanlıurfa

no	Name	Institution / Unit	Province
71	Kudret Rat	Şanlıurfa Metropolitan Municipality - Parks and Gardens Department	Şanlıurfa
72	Mehmet Işık	Şanlıurfa Metropolitan Municipality - Parks and Gardens Department	Şanlıurfa
73	Özlem Kendirci	Şanlıurfa Metropolitan Municipality - Parks and Gardens Department	Şanlıurfa
74	Sevda Samak	Şanlıurfa Metropolitan Municipality - Parks and Gardens Department	Şanlıurfa
75	Bekir Yavuz		Şanlıurfa
76	Ali Volkan Bilgili	Harran University	Şanlıurfa
77	Mahmut Kaya	Harran University	Şanlıurfa
78	Emrah Ramazanoğlu	Harran University	Şanlıurfa
79	İrfan Özberk	Harran University	Şanlıurfa
80	Mehmet Ali Çullu	Harran University	Şanlıurfa
81	Romedi Çelik	Harran University	Şanlıurfa
82	Şükrü Gürler	Harran University	Şanlıurfa
83	Ali Rıza Öztürkmen	Harran University Independent Experts Group	Şanlıurfa
84	Ömer Faruk Kaya	Harran University Independent Experts Group	Şanlıurfa
85	Tahir Polat	Harran University Independent Experts Group	Şanlıurfa
86	Büşra Bayık	ÇEVKO Foundation	Şanlıurfa
87	Hatice Akgül	ÇEVKO Foundation	Şanlıurfa
88	Hasan Eyyüpoğlu	Sheep and Goat Breeders' Association	Şanlıurfa
89	Abdullah Açıkgöz	Şanlıurfa Chamber of Veterinarians	Şanlıurfa
90	Nadiye Şihanlıoğlu	Şanlıurfa Chamber of Veterinarians	Şanlıurfa
91	Mustafa Kandırmış	7th Regional Directorate	Adana
92	Aydın Cesur	Adana Provincial Directorate of Agriculture and Forestry	Adana
93	İsmail Kozan	3rd Regional Directorate Adıyaman Branch Office	Adıyaman
94	Şahin Çılgın	5th Regional Directorate	Afyon
95	Koray Sunamak	9th Regional Directorate	Ankara
96	Zafer Çelik	Ankara Provincial Directorate of Agriculture and Forestry	Ankara
97	Yüsra Gül Tozoğlu Koçoğlu	General Directorate of the European Union and Foreign Relations	Ankara
98	Tuncay Gürsoy Yüce	General Directorate of Plant Production Department Head	Ankara
99	Kürşat Kağan Yeşil	General Directorate of Plant Production	Ankara
100	Davut Özgür	General Directorate of Plant Production National Project Implementation Unit	Ankara

no	Name	Institution / Unit	Province
101	Esra Esina	General Directorate of Plant Production Project Focal Point	Ankara
102	Gültekin Öçalan	General Directorate of Plant Production National Project Implementation Unit	Ankara
103	Tuğba Usta	General Directorate of Nature Conservation and National Parks Head of Working Group - Project Focal Point	Ankara
104	Abdulsamet Haçat	General Directorate of Nature Conservation and National Parks National Project Implementation Unit	Ankara
105	Burak Tatar	General Directorate of Nature Conservation and National Parks National Project Implementation Unit	Ankara
106	Fatih Köylüoğlu	General Directorate of Nature Conservation and National Parks National Project Implementation Unit	Ankara
107	Ömer Faruk Aslan	General Directorate of Nature Conservation and National Parks National Project Implementation Unit	Ankara
108	Serhat Erbaş	General Directorate of Nature Conservation and National Parks National Project Implementation Unit	Ankara
109	Ümit Bolat	General Directorate of Nature Conservation and National Parks National Project Implementation Unit	Ankara
110	Aysun Özkan	General Directorate of Nature Conservation and National Parks	Ankara
111	Cihad Öztürk	General Directorate of Nature Conservation and National Parks	Ankara
112	Erdoğan Ertürk	General Directorate of Nature Conservation and National Parks	Ankara
113	Erol Kuru	General Directorate of Nature Conservation and National Parks	Ankara
114	Gencay Serter	General Directorate of Nature Conservation and National Parks	Ankara
115	Gökhan Yıldırım	General Directorate of Nature Conservation and National Parks	Ankara
116	Hüseyin Gökçe	General Directorate of Nature Conservation and National Parks	Ankara
117	İsmail Üzmez	General Directorate of Nature Conservation and National Parks	Ankara
118	Mustafa Yılmaz	General Directorate of Nature Conservation and National Parks	Ankara
119	Neşe Ersöz	General Directorate of Nature Conservation and National Parks	Ankara
120	Nurcihan Mercan Erdoğan	General Directorate of Nature Conservation and National Parks	Ankara
121	Mehmet Koç	General Directorate of Forestry Department Head of Foreign Relations Training and Research	Ankara
122	Ramazan Balı	General Directorate of Forestry Department of Foreign Relations Training and Research	Ankara
123	Kıymet Keleş	General Directorate of Forestry National Project Implementation Unit	Ankara
124	Türkan Özdemir	General Directorate of Forestry National Project Implementation Unit	Ankara

no	Name	Institution / Unit	Province
125	Cezmi Keleş	General Directorate of Forestry	Ankara
126	Nuran Karaçorlu	General Directorate of Forestry	Ankara
127	Şenol Oktay Keten	General Directorate of Forestry	Ankara
128	Uğur Tüfekçioğlu	General Directorate of Forestry	Ankara
129	Yaşar Sönmez	General Directorate of Forestry	Ankara
130	Erol Bulut	General Directorate of Livestock	Ankara
131	Nuray Beşaltı	General Directorate of Livestock	Ankara
132	Ömer Bedir Erdem	General Directorate of Livestock	Ankara
133	Ayşe Gökçe Yücel	General Directorate of Spatial Planning	Ankara
134	Simge Poyraz	General Directorate of Spatial Planning	Ankara
135	Esra Akçelik	General Directorate of Agricultural Research and Policies	Ankara
136	Hatice Özlem Gürbüz	General Directorate of Agricultural Research and Policies	Ankara
137	İhsan Çetin	General Directorate of Agricultural Research and Policies	Ankara
138	Naciye Çakır	General Directorate of Agricultural Research and Policies	Ankara
139	Şenay Boyraz Topaloğlu	General Directorate of Agricultural Research and Policies	Ankara
140	Arzu Özer	General Directorate of Agrarian Reform	Ankara
141	N. Cem Aktuz	General Directorate of Agrarian Reform	Ankara
142	Fatma Kurt	Retired Public Staff Member	Ankara
143	Özgün Talan	Antalya Provincial Directorate of Agriculture and Forestry	Antalya
144	Sinan Aykan	Antalya Provincial Directorate of Agriculture and Forestry	Antalya
145	Orhan Ceylan	6th Regional Directorate	Burdur
146	Murat Yıldırım	15th Regional Directorate	Diyarbakır
147	Oral Özgen	Diyarbakır Provincial Directorate of Agriculture and Forestry	Diyarbakır
148	Fehmi Yüksel	13th Regional Directorate	Erzurum
149	Fethi Akman	Erzurum Provincial Directorate of Agriculture and Forestry	Erzurum
150	Şerafettin Çakal	General Directorate of Agricultural Research and Policies	Erzurum
151	Hüseyin İnce	3rd Regional Directorate Gaziantep Branch Office	Gaziantep
152	Mustafa Gözel	3rd Regional Directorate Gaziantep Branch Office	Gaziantep
153	Bedir Katrancı	Gaziantep Provincial Directorate of Agriculture and Forestry	Gaziantep
154	Yılmaz Türk	İstanbul Provincial Directorate of Agriculture and Forestry	İstanbul
155	Mustafa Alkan	8th Regional Directorate	Karaman
156	Durmuş Batu	Kars Provincial Directorate of Agriculture and Forestry	Kars
157	Ergun Yılmaz	Kayseri Provincial Directorate of Agriculture and Forestry	Kayseri
158	Hüseyin Gökdeniz	3rd Regional Directorate Kilis Branch Office	Kilis
159	İ. Serhat Uğraş	8th Regional Directorate	Konya
160	Mustafa Tuğrul Şahin	8th Regional Directorate	Konya
161	Yakup Avcı	8th Regional Directorate	Konya
162	Şevket Bozdağ	15th Regional Directorate	Malatya

no	Name	Institution / Unit	Province
163	M. Beşir Ünat	3rd Regional Directorate Mardin Branch Office	Mardin
164	Oral Özgen	Diyarbakır Provincial Directorate of Agriculture and Forestry	Diyarbakır
165	Üzeyir Tombul	Konya Provincial Directorate of Agriculture and Forestry	Konya
166	Mehmet Latif İnanç	Mardin Provincial Directorate of Agriculture and Forestry	Mardin
167	Fatih Süzgeç	Muş Provincial Directorate of Agriculture and Forestry	Muş
168	Recai Gündüz	Ordu Provincial Directorate of Agriculture and Forestry	Ordu
169	Özkan Bayrak	Osmaniye Provincial Directorate of Agriculture and Forestry	Osmaniye
170	Erol Çiftçi	Sivas Provincial Directorate of Agriculture and Forestry	Sivas
171	Orhan Kalay	3rd Regional Directorate Şırnak Branch Office	Şırnak
172	Suat Safran	Van Provincial Directorate of Agriculture and Forestry	Van
173	M. Zülfü Yıldız	Adıyaman University	Adıyaman
174	Alptekin Karagöz	Aksaray University	Aksaray
175	Selçuk Tuğrul Körüklü	Ankara University	Ankara
176	Bülent Gülçubuk	Ankara University	Ankara
177	F. Güler Ekmekçi	Hacettepe University	Ankara
178	Latif Kurt	Ankara University	Ankara
179	Nilgül Karadeniz	Ankara University	Ankara
180	Hayrettin Kendir	Ankara University	Ankara
181	Zekiye Çetinkaya	Ankara University	Ankara
182	Tuna Ekim	Retired Instructor	Ankara
183	Mecit Vural	Gazi University	Ankara
184	Burcu Tarıkahya Hacıoğlu	Hacettepe University	Ankara
185	Can Bilgin	Middle East Technical University	Ankara
186	Bilal Şahin	Çankırı Karatekin University	Çankırı
187	Recep Karakaş	Dicle University	Diyarbakır
188	Didem Ambarlı	Düzce University	Düzce
189	Itır Erhart	Bilgi University	İstanbul
190	Alper Hüseyin Çolak	İstanbul University - Cerrahpaşa Faculty of Forestry	İstanbul
191	Kenan Ok	İstanbul University - Cerrahpaşa Faculty of Forestry	İstanbul
192	Evrim Karaçetin	Erciyes University	Kayseri
193	Hakan Gür	Ahi Evran University	Kırşehir
194	Zeki Acar	Ondokuz Mayıs University	Samsun
195	Aydan Özkil	The Food and Agriculture Organization of the United Nations (FAO) Program Assistant	Ankara
196	Burak Avcıoğlu	The Food and Agriculture Organization of the United Nations (FAO)	Ankara
197	Fatma Güngör	The Food and Agriculture Organization of the United Nations (FAO) Sustainable Land Management Project National Project Coordinator	Ankara

no	Name	Institution / Unit	Province
198	Nihan Yenilmez Arpa	The Food and Agriculture Organization of the United Nations (FAO) Steppe Project National Project Coordinator	Ankara
199	Nilüfer Gündüz	The Food and Agriculture Organization of the United Nations (FAO)	Ankara
200	Peter Pechacek	The Food and Agriculture Organization of the United Nations (FAO)	Ankara
201	Sibel Nihal Tekin	The Food and Agriculture Organization of the United Nations (FAO)	Ankara
202	Şafak Toros	The Food and Agriculture Organization of the United Nations (FAO)	Ankara
203	Yeryeong Joo	The Food and Agriculture Organization of the United Nations (FAO)	Ankara
204	S. Serhat Arda	ANÇEO	Ankara
205	İlker Özbahar	Nature Research Society	Ankara
206	İlhan Koçulu	Entrepreneur	İstanbul
207	Ercan Sütlü	WWF-Turkey	Ankara
208	Mehmet Tural	WWF-Turkey	İstanbul
209	Volkan Büyükgüngör	Anadolu Meraları – Savory Institute	İstanbul
210	Durukan Dudu	Anadolu Meraları – Savory Institute	İstanbul
211	Cansu Dinç	Doğa Koruma Merkezi	Ankara
212	Deniz Tapan	Doğa Koruma Merkezi	Ankara
213	Fethiye Arslantaş	Doğa Koruma Merkezi	Ankara
214	Gelincik Deniz Bilgin	Doğa Koruma Merkezi	Ankara
215	Gülden Atkın Gençoğlu	Doğa Koruma Merkezi	Ankara
216	Hakan Eligül	Doğa Koruma Merkezi	Ankara
217	Melike Kuş	Doğa Koruma Merkezi	Ankara
218	Mustafa Durmuş	Doğa Koruma Merkezi	Ankara
219	Özge Balkız	Doğa Koruma Merkezi	Ankara
220	Semiha Demirbaş Çağlayan	Doğa Koruma Merkezi	Ankara
221	Tuba Bucak	Doğa Koruma Merkezi	Ankara
222	Tuğsesu Toga	Doğa Koruma Merkezi	Ankara
223	Uğur Zeydanlı	Doğa Koruma Merkezi	Ankara
224	Yıldıray Lise	Doğa Koruma Merkezi	Ankara
225	Zeynep Deniz Yalçın	Doğa Koruma Merkezi	Ankara

ANNEX 5. Circular on the National Biodiversity Coordination Board

GENELGE

Cumhurbaşkanlığından:

Konu: Ulusal Biyolojik Çeşitlilik
Koordinasyon Kurulu

GENELGE
2019/15

Dünyanın biyolojik kaynakları, insanlığın ekonomik ve sosyal gelişimi için hayati öneme sahiptir. Biyolojik çeşitliliğin korunması, biyolojik kaynakların sürdürülebilir kullanımı ve genetik kaynakların kullanımından kaynaklanan faydaların adil ve hakkaniyete uygun şekilde paylaşımını amaçlayan Biyolojik Çeşitlilik Sözleşmesi ülkemiz tarafından 29/8/1996 tarihli ve 4177 sayılı Kanun ile onaylanarak uygun bulunmuştur.

2022-2024 yılları arasında Sözleşmenin dönem başkanlığı ülkemiz tarafından yürütülecek ve 2022 yılının son çeyreğinde düzenlenecek Biyolojik Çeşitlilik Konferansına ev sahipliği yapılacaktır. Küresel biyoçeşitlilik gündemindeki gelişmelerin takibi, biyolojik çeşitliliğin sürdürülebilir bir şekilde ekonomiye kazandırılması, Sözleşmenin ve dönem başkanlığının etkin olarak yürütülmesi amacıyla Tarım ve Orman Bakanı başkanlığında Ulusal Biyolojik Çeşitlilik Koordinasyon Kurulu (Kurul) kurulmuştur.

Kurul; Strateji ve Bütçe Başkanlığı, Cumhurbaşkanlığı Bilim, Teknoloji ve Yenilik Politikaları Kurulu, Tarım ve Orman, Çevre ve Şehircilik, Dışişleri, Enerji ve Tabii Kaynaklar, İçişleri, Kültür ve Turizm, Milli Eğitim, Sağlık, Sanayi ve Teknoloji, Ticaret, Ulaştırma ve Altyapı Bakanlıkları ile Türkiye Bilimsel ve Teknolojik Araştırma Kurumu, Türkiye Odalar ve Borsalar Birliği, Dış Ekonomik İlişkiler Kurulu ve Türk Mühendis ve Mimar Odaları Birliği Orman Mühendisleri Odası adına karar vermeye yetkili üst düzey temsilcilerin katılımıyla oluşur.

Kurul yılda en az bir defa toplanacak, çalışma usul ve esasları Kurul tarafından belirlenecek, Kurulun sekretarya hizmetleri ve koordinasyon işleri Tarım ve Orman Bakanlığı tarafından yürütülecektir. Kurul çalışmalarında ihtiyaç duyulacak ayrıntılı teknik bilgilerin alınması ve değerlendirilebilmesi amacıyla alt kurullar, teknik komiteler, danışma ve çalışma grupları oluşturulabilecektir. İlgili kamu kurum ve kuruluşlarının yanı sıra üniversiteler, sivil toplum temsilcileri, meslek birlikleri ve özel sektör temsilcileri Kurul toplantılarına davet edilebilecek; alt kurul, komite, danışma grupları ve çalışma gruplarında yer alabileceklerdir.

Kurul çalışmalarının bir bütünlük içinde yürütülmesi ve eşgüdümün sağlanması için tüm kamu kurum ve kuruluşlarınca gereken destek ve yardım sağlanacaktır.

Bilgilerini ve gereğini rica ederim.

1 Ağustos 2019

Recep Tayyip ERDOĞAN
CUMHURBAŞKANI

Conservation and Sustainable Management of Turkey's Steppe Ecosystems Project

GCP/TUR/061/GFF

For detailed information

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Republic of Turkey Ministry of Agriculture and Forestry

General Directorate of Nature Conservation and National Parks
https://www.tarimorman.gov.tr/DKMP

General Directorate of Plant Production
https://www.tarimorman.gov.tr/BUGEM

General Directorate of Forestry
https://www.ogm.gov.tr