Conservation and Sustainable Management of Turkey’s Steppe Ecosystems Project

GCP/TUR/061/GFF

I am learning the steppes

Student’s activity book

Animals of the steppe
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Introducción

Las estepas son una de las ecosistemas más importantes y sensibles de Turquía. Los ecosistemas de estepa de Turquía incluyen estepas naturales, praderas y pastizales. Los ecosistemas de estepa se encuentran principalmente en las regiones de Anatolia Central, Anatolia Oriental y Anatolia del Sureste. Los ecosistemas de estepa en Turquía enfrentan amenazas como la pérdida de hábitat asociada a inversiones, presión urbanística, minería, sobropastoreo y prácticas de reforestación en áreas inapropiadas y los efectos del cambio climático.

En este contexto, el Proyecto de Conservación y Manejo Sostenible de los Ecosistemas de Estepa de Turquía se implementa por la Organización de Agricultura y Alimentación de las Naciones Unidas (FAO), el Ministerio de Agricultura y Forestal Dirección General de Conservación de la Naturaleza y Parques Nacionales (DGNCNP), Dirección General de Producción Vegetal (DGPP) y Dirección General de Forestación (GDF) con el apoyo financiero del Fondo de Medio Ambiente Global (GEF). El objetivo del proyecto es garantizar la gestión efectiva de áreas protegidas y promover la conservación de la biodiversidad de las estepas en paisajes productivos para fortalecer los esfuerzos para la conservación de los ecosistemas de estepa de Turquía.

En el proyecto, programas educativos son implementados para diferentes grupos de interés, incluyendo profesores, estudiantes, expertos y decision makers responsables de la gestión de áreas protegidas. Se diseñó un programa educativo para los estudiantes que incluye actividades de pintura de pared y teatro con los artistas, concursos de poesía y dibujo entre escuelas, y un festival de aves con los artistas. Además, se establecieron rincones de naturaleza que muestran las características de las estepas en ciertas escuelas.

Como parte del programa educativo y de sensibilización, se preparó un kit educativo para profesores y estudiantes. Este kit es un documento de consulta para aumentar el conocimiento, el interés y la conciencia de los niños sobre los ecosistemas de estepa de Şanlıurfa. Con este kit, se podrá explorar la diversidad y la importancia de las estepas desde diferentes perspectivas como la historia, la biología, la geografía, la sostenibilidad, y el cambio climático.
The educational kit includes four activity books for students and a teacher’s guide. In each of the activity books, you will find different, fun and interesting activities. You can reproduce the activity pages in the activity books using a photocopier.

Game – arts: Students will get to know the biological diversity of the steppes by playing games and doing crafts.

Literature – creative drama: Students will learn about the steppe ecosystems by writing stories and role-playing about threatened or endangered species.

Science – technology: Students will collect data on biodiversity and prepare an action plan on the steppe ecosystems based on their findings, following similar steps of a scientist.

Design – STEM: By using the scientific method, students will develop projects to utilize the natural resources of the steppes sustainably and to conserve our planet.

Communication – docial media: Students will launch a campaign to inform their peers about the current state of the steppe ecosystems and shoot a short film about the history and archeology of their location.

How to use the activity book?

Are you ready to study the animals? Answer a few questions before you start. Discover your level, what you want to do, what you are interested in.

1. What is your level as a zoologist?
   - Beginner
   - Intermediate
   - Expert

2. What do you know about zoology?
   ...............................................................
   ...............................................................
   ...............................................................

3. In which season would you like to work?
   - Summer
   - Fall
   - Winter
   - Spring
   - All

4. How often will you work on this?
   - Daily
   - Weekly
   - Monthly
   - Seasonally

5. Which topics below interest you?
   - Birds
   - Insects
   - Small mammals
   - Large mammals
   - Animal behavior
   - Nature conservation
   - Population genetics
   - Combatting wildlife trade

great tit
Animals of the steppe

Vast Şanlıurfa steppes are within an interesting geography. Low plains in the south are replaced by high plains in the north. In this region, there are animal species specific to Şanlıurfa steppes, which are adapted to a climate that can be considered semi-desert. According to scientific studies, a total of 376 animal species live in Şanlıurfa and 245 of them are birds, 47 are reptiles, 46 are mammals, 32 are freshwater fish and 6 are amphibia. Among these, 2 mammal species, namely Arabian sand gazelles and striped hyaena, 6 bird species, namely Northern bald ibis, Egyptian vulture, white-headed duck, sociable lapwing, great bustard and pallid scops owl, 2 reptile species, namely Bosc’s fringe-fingered lizard and Harran lizard, and 1 amphibian species, namely near eastern fire salamander are currently monitored by the 3rd Regional Directorate of Nature Conservation and National Parks and the monitoring studies will continue in the following years.

Kızılıkuyu wildlife reserve
Kızılıkuyu wildlife reserve is the only area in our country where the Arabian sand gazelle is naturally found. In addition to Arabian sand gazelle, mammal species in this area are lynx, golden jackal, red fox, European hare, Eurasian badger, Indian crested porcupine, long-eared hedgehog, marbled polecats, beech marten and Palestine mole rat. Arabian sand gazelle and marbled polecats have “Vulnerable” (VU) status at the global scale. In addition to bird species like cream-colored cursor, see-see partridge, red-wattled lapwing, sociable lapwing, blue-cheeked bee-eater, pale rockfinch, yellow-throated sparrow and pin-tailed sandgrouse, there are also important reptile species such as Levantine viper, desert black cobra and long-nosed worm snake.

Tek tek mountains national park
Tek tek mountains national park contains diverse habitats with its deep valleys, woodlands, caves, rocky-stony areas, and lowland steppes. Species such as grey wolf, red fox, least weasel, European hare, beech marten, Indian crested porcupine, long-eared hedgehog, and the Euphrates jerboa are the mammal species of this area. The grey wolf has a regulatory role in the steppe ecosystems by virtue of being at the top of the food chain and keeping the population density of the species it preys on at a certain level. Red fox and beech marten, two predatory species, play an important ecological role especially by keeping the population levels of small rodent species in balance.
The European hare in this area is an important food source for predatory mammal species. The red-wattled lapwing, pale rockfinch, see-see partridge and desert lark are the bird species recorded in the area. Levantine viper, desert monitor and western leopard gecko are among the important reptile species that live in Tek Tek Mountains. The butterfly species observed in the area, namely large salmon Arab and African migrant, live in arid areas in more southern latitudes, such as North Africa and the Middle East, and the northernmost edge of their distribution in the world is Şanlıurfa.

Karacadağ steppes
Mammalian species of Karacadağ steppes are grey wolf, red fox, Eurasian badger, European hare, wild boar, marbled polecat, Palestine mole rat, Indian crested porcupine and long-eared hedgehog. The grey wolf, the red fox and the marbled pole cat play an important ecological role especially by keeping populations of small rodent species at a certain level. Spectacled warbler, pale rockfinch and see-see partridge are among the important bird species known to live in the area. Being the only known breeding site of spectacled warbler in Turkey, Karacadağ steppe has a special importance. Endemic cricket species are also observed in this area.

Threats
Conversion of steppes into agricultural fields leads to habitat loss and fragmentation. This, as a result, narrows the habitats of the animals that use these areas. Insecticides used in agricultural lands pollute soil and water resources. Presence of clean water resources is very important for life on steppes, especially for arid regions like Şanlıurfa. The expansion of residential areas and industrial zones towards the steppes is another reason for habitat loss. This situation affects not only the settlement areas but also the wildlife surrounding them. Excessive and uncontrolled grazing poses a threat to the biodiversity of the steppes, which accommodate many endemic plant species. Especially some butterfly species lay their eggs on specific plant species. The larvae hatching from the eggs feed on these plants, so the life cycle of these butterfly species depends on the existence of these plant species.

Illegal hunting and collection in our country are some other threats to steppe animals. Poaching puts great pressure on the threatened species; therefore, animals such as Anatolian mouflon and Arabian sand gazelle came to the brink of extinction in the 1960s. Today, we owe their existence to the conservation of the species, their reproduction at the breeding stations and their release into their former habitats.
Go take a walk and find prints and signs of the animals below.
You can observe animal footprints.

You can find animal scat.

Moth
Grey heron
Spider
Snail
Green-underside blue
Ladybug
Great tit
Calandra lark
Clouded yellow
**Activity 2**  
**Science - technology**

## Animal behavior

Go take a walk and choose an insect, bird or reptile, observe and take notes on the observation form below.

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<tr>
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<th>Weather:</th>
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<th>Physical features:</th>
<th>Draw the animal</th>
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<td>Animal's</td>
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<td>corn bunting</td>
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Let’s make a crested lark

You can use the template below and make yourself a toy. For instance a crested lark!

Using the template, draw the bird’s body and wings on the cardstock and cut them out. Assemble and glue the body to form a cylindrical shape. Cut out the tiny circles on the body and the wings. Then, attach the wings to the bird’s body using paper fasteners. Attach paper clips to the edges of the wings. Add details such as the eyes, the beak, the feet, the crest, and the feathers. Tie the yarn through the holes on top and hang the bird somewhere. Tie a piece of yarn through the holes in the wings and let them hang down. Your bird is ready. As you pull the rope below, the wings will move, and the bird will fly.
Eurasian badger
Free space

This page is left blank as it will be cut, you can draw here as you please.
Bird bingo

Cut out the bingo cards on this page and the chips on the next page. Then, hand out a bingo card to the players. Put the chips in a bag.

Eurasian magpie  Corn bunting  Long-legged buzzard  Eurasian hoopoe
Common kestrel  Eurasian blackbird  Cream-colored courser
Common starling  Sociable lapwing  Pale rockfinch
Great grey shrike  Little owl  Little bustard  Eurasian jay
See-see partridge  Crested lark  Common kestrel
Sociable lapwing  Corn bunting  Great tit
One player draws a bird card from the bag and calls it out. Everyone checks his/her bingo cards. If the picture of the same bird is on his/her bingo card, it is covered with a chip. When all the bird pictures in the first line on the bingo card are covered with chips, the owner of the card goes loudly “First Bingo” (“birinci çinko” in Turkish) and when all the pictures on the two lines are covered, the player goes “Second Bingo” (“ikinci çinko” in Turkish). When all the bird pictures on the three lines in a bingo card are covered, the player goes “Third Bingo” (“tombala” in Turkish) and wins the game.
Free space

This page is left blank as it will be cut,
you can draw here as you please.
Great tit

Eurasian hoopoe

Great bustard

Corn bunting

European greenfinch

Eurasian magpie

Grey heron

Common kestrel

Long-legged buzzard

Pin-tailed sandgrouse

European robin

Sociable lapwing
Little owl
Finsch's wheatear
Crested lark
Eurasian jay
Little bustard
Great grey shrike
Cream-colored courser
Pied avocet
See-see partridge
Common starling
Eurasian blackbird
Pale rockfinch
Free space

This page is left blank as it will be cut, you can draw here as you please.
**Activity 5**

**Science – technology**

Let’s count the butterflies

These are the most common 21 butterfly species. On a sunny day, spend 15 minutes counting the butterflies and enjoy butterfly watching.

- **Spotted fritillary**
  *Melitaea didyma*

- **Swallowtail**
  *Papilio machaon*

- **Large white**
  *Pieris brassicae*

- **Small white**
  *Pieris rapae*

- **Brown argus**
  *Aricia agestis*

- **Common blue**
  *Polyommatus icarus*

- **Eastern bath white**
  *Pontia edusa*

- **Orbed red underwing skipper**
  *Spialia orbifer*

- **Painted lady**
  *Vanessa cardui*

Butterfly photographs: Süleyman Ekşioğlu, Onat Başbey, Ahmet Baytaş, Hilary Welch, Geoff Welch
ANIMALS OF THE STEPPE

- Orange-tip
  *Anthocharis cardamines*
- Eastern steppe festoon
  *Zerynthia deyrollei*
- Cardinal
  *Argynnis pandora*
- Sooty orange-tip
  *Zegris eupheme*
- Small skipper
  *Thymelicus sylvestris*
- Clouded yellow
  *Colias crocea*
- Inky skipper
  *Erynnis marloyi*
- Lang's short-tailed blue
  *Leptotes pirithous*
- Red admiral
  *Vanessa atalanta*
- Small copper
  *Lycaena phlaeas*
- Levantine silver-line
  *Apharitis cilissa*
- Balkan marbled white
  *Melanargia larissa*
In the male, the border lines are black, the upper surface of the wings is bright reddish orange, and the lower edge spots on the fore wing are round or rectangular.

**Spotted Fritillary**  
*Melitaea didyma*

A large yellow-colored butterfly with a long tail, yellow edge bottom bands divided by black stripes and small speckles. It has a wide blue middle outer band on the hind wing.

**Swallowtail**  
*Papilio machaon*

It is much larger than the small white. The upper surface of the wings in males is white without spots, except for the black spot, which starts from the apex of the fore wing and goes down further along the outer edge than other whites.

**Large white**  
*Pieris brassicae*

2.5 cm. On the upper side of the fore wing, there is one black spot in males and two black spots in females. It has a variable amount of whitish scales.

**Small white**  
*Pieris rapae*

The upper side of the wings is brown. There is an orange or red bottom speckle array on the margin. On the hind wing, a triangular white spot extends from the outer edge to the middle part.

**Brown argus**  
*Aricia agestis*

The upper wing of the male is purplish blue, has black border lines and thin fringes are white.

**Common blue**  
*Polyommatus icarus*

The lower side of the hind wing is olive green and with a white mottled pattern.

**Eastern bath white**  
*Pontia edusa*

The white spots on the patterned black upper surface are smaller, especially those in the hind wing midline band, and the basal spots on the fore wing are either absent or very vague.

**Orbed red underwing skipper**  
*Spialia orbifer*

The top and bottom of the wing are basically orange, with four solid black eyespots on the border of the hind wing.

**Painted lady**  
*Vanessa cardui*
<table>
<thead>
<tr>
<th>Animal Name</th>
<th>Scientific Name</th>
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<tbody>
<tr>
<td>Orange-tip</td>
<td>Anthocharis cardamines</td>
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<tr>
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<td>Zerynthia deyrollei</td>
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<td>Thymelicus sylvestris</td>
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<td>Leptotes piritious</td>
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<td>Vanessa atalanta</td>
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<td>Small copper</td>
<td>Lycaena phlaeas</td>
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<td>Levantine silver-line</td>
<td>Apharitis cilissa</td>
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<tr>
<td>Balkan marbled white</td>
<td>Melanargia larissa</td>
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</table>

On the lower surface of the fore wing there is a wide orange midline band. It is distinguished by a round disc-shaped spot with clear borders on the fore wing.

It is dazzling with its black red spots and yellow wings decorated with bands. The outer edge of the hind wing is very clearly scalloped.

The male has a large number of black spots that turn green on the orange upper surface of the wings. The wings of females are much greener. The middle part of the lower surface of the fore wings is bright rose red.

In the male, the ground color of the upper surface of the wings is white, and the large oval orange spot on the fore wing tip is surrounded by black scales.

On the bright yellowish-brown upper face of the wings, the black of the border lines has a “clean” appearance (in other words, the black scales do not spill and scatter on the wing).

The upper side of the wings is yellowish-orange and the black wing edge bands are quite wide. On the lower surface of the front edge, the middle zone is yellowish-orange and there is a round black disc spot, which is often solid.

Its wings are dark brown to black and do not have white margins. The two black stripes run across the upper surface of the fore wing.

On the lower surface of the hind wings, there is a middle outer band of white crescents, and the black borderlines of the wing upper surface are thinner in males.

It is easily recognized by the white spots on the tips of its upper wings and the blackish wings that carry the reddish stripes on the edge of the fore wing and the hind wing.

There is an orange background on the underside of the fore wing with large black spots.

The black rectangle on the lower surface of the wings and the inside of the rings are decorated with shiny silver scales.

Basal areas on the upper side of the wings are blackish, the black line crossing the fore wing cell appears lighter on the lower surface.
Activity 6  Literature - creative drama

Life cycle

Here are the stages of a butterfly’s life cycle. Write the name of each stage on the dotted lines and color the drawings with your crayons.
Eurasian hoopoe

ANIMALS OF THE STEPPE
Kızılkuyu of Şanlıurfa is the only area in our country where the Arabian sand gazelle is naturally found. For this reason, it was declared a ‘Wildlife Reserve (WR)’ in 2006 with a view to protecting the Arabian sand gazelles. Arabian sand gazelles bred in this area are released back into the nature.

The scientific name of the Şanlıurfa gazelles in Kızılkuyu WR is *Gazella marica* and it is a different species from the mountain gazelle (*Gazella gazella*) in Hatay.
1. What are the three important features of the Arabian sand gazelles?

2. What kind of an advantage does living in the steppe give to the Arabian sand gazelle?

3. What can we do to conserve the Arabian sand gazelles?
Nature conservation

Research the animals living in the following three areas, and write ten items on what to do to conserve them.

Kızılıkuyu wildlife reserve

Tek tek mountains national park

Karacadağ steppes
common kestrel
Village council

Read the script below and choose one of the role cards to prepare a speech to deliver in the village council.

The script
There is a big steppe in a village near an ancient city. Some people want this place to be used as a grazing area, a rangeland. A large company will establish a livestock farm here. A local and non-governmental organization (NGO) is against this. A meeting is held in the village council under the chairmanship of the headman (muhtar).

Role cards

Village headman (Muhtar)
You moderate the meeting, you are impartial. You give voice to everyone. You are trying to help reach an agreement. You do not want to lose your reputation.

Journalist
You are impartial, trying to listen to everyone. You are trying to collect information by asking ‘what, where, when, who, how, why’.
NGO expert
You explain the problems that the livestock farm will create. There are ancestors of genetically valuable wheat, lentil, and rice varieties in the steppe. These need to be protected. It is also an opportunity to develop ecotourism for the nearby ancient city.

Village resident
You think of the future of your kids. You are undecided. You want to protect both the rangeland and earn money by working on the livestock farm. You are listening to the authorities. You are asking questions.

Shepherd
You are absolutely against this establishment. Your job is in danger. If the livestock farm is opened, you will not be needed. You do not want to lose your job.

Construction company officer
You want to do this project. You claim that the houses to be built by the lake will revive tourism.
Nature-friendly animal husbandry

Overgrazing threatens the steppes. How can we achieve nature-friendly animal husbandry, draw below.
Tortoise
Glossary

**A**

**Abiotic factors:** Non-living chemical and physical parts of the environment that affect living organisms and the functioning of ecosystems such as light, temperature, precipitation, soil and rocks.

**Agricultural field:** Lands with soil, topography and other ecological features that are suitable for the production of plant, animal and aquaculture products, lands that are already utilized for this purpose and that can be transformed to be suitable for the production of plant, animal and aquaculture products by economical zoning, restoration and reclamation.

**B**

**Biocontrol:** Using other living organisms against pests, diseases and weeds in agricultural production to keep the harmful agents below the level of economic damage.

**Biodiversity:** The variety and richness of plant and animal species in a certain area; the diversity of living things in that area, an indicator of a healthy habitat.

**Biomass:** The general name for all non-fossilized biological material derived from living organisms or organisms that lived until recently. Biomass, which is a source of energy, is used for production of fuel from these biological substances or for other industrial purposes. It sources energy generation from crops such as corn, wheat, etc., and herbs, moss, algae at sea, animal waste, agricultural waste, fertilizers and industrial waste, and all organic waste from households.

**Biotic factors:** Living organisms in an environment such as plants, animals, and microorganisms.

**Botany:** The science that studies plants; plant science.

**C**

**Carbon cycle:** The circulation of carbon atoms among the atmosphere, oceans, and the earth as a result of physical, geological, chemical and other processes. Most carbon is available in the form of carbon dioxide. The carbon is exchanged among the atmosphere, lithosphere, biosphere and hydrosphere.

**Carbon footprint:** Total greenhouse gas emissions from production and fossil fuels used in the country, carbon emitted during the production process of products imported from abroad, the country's share in emissions from international trade and non-fossil carbon emissions.

**Climate change:** Changes in climate that are attributed directly or indirectly to human
activity, alter the composition of the global atmosphere and are in addition to natural climate variability observed over comparable time periods.

**Climate change adaptation:** The process of developing, strengthening and implementing strategies to combat the adverse effects of climate change and taking appropriate action to prevent or minimise the damage they can cause, or taking advantage of opportunities that may arise.

**Climate change mitigation:** Measures for controlling, reducing and sequestration of greenhouse gases causing climate change result from human activities.

**Compost:** Product made of decomposing organic waste in an oxygen or oxygen-free environment. Compost is a mixture of decayed plants and vegetable waste that is added to the soil to help plants grow.

**Ecological footprint:** Impact of human activities measured in terms of the area of biologically productive land and water required to produce the goods consumed by an individual, community or activity and to assimilate the waste generated.

**Ecological relationships:** The relationships of living organisms with their habitats and with each other.

**Ecologist:** A person dealing with ecology, expert in ecology, naturalist.

**Ecology:** A branch of science that examines the relationships of living organisms and environment and how the organisms interact with each other and their environment, individually or together. Ecology examines the relationships between the living organisms such as plants, soil, animals, and humans, and the non-living organisms in the environment such as climate, surface features, and parent material.

**Ecosystem:** Natural structures consisting of living organisms (plant, animal and micro-organism groups) that live and interact with each other in a specific environment and the non-living organisms. Forests, deserts, meadows, city parks, mountains are examples of ecosystems.

**Ecosystem services:** Services provided by the natural environment from which people benefit. Services such as provision of food and clean water, maintaining the air quality, ensuring the water cycle, regulation of climate, erosion control, recreational services, ecotourism, biomass production, and enabling people to survive and live in prosperity.

**Endemic:** A plant or animal that lives or grows naturally only in one specific region on Earth. It is a region-specific animal/plant species that lives/grows only in a certain region and cannot live/grow elsewhere in the world due to the ecological conditions of the region it is located at.
Energy efficiency: Minimizing the amount of energy consumed without reducing the quantity and quality in production and without preventing economic development and social welfare. Using less energy to perform the same task.

Energy saving: Efforts to reduce energy consumption. Energy savings can be achieved with efficient energy use and/or low energy consumption from conventional energy sources. Turning off an unnecessary light is energy saving. To provide lightening by using a more efficient bulb is the efficient use of energy.

Erosion: Abrasion and degradation of a land by processes such as breakdown, drift, thawing, moving and mass movement caused by streams, rain, wind, glaciers, waves, gravity or other geological factors.

Green infrastructure: It is defined as a tool to provide ecological, economic, and social benefits through nature-based solutions, to help understand the benefits nature offers and to mobilize investments that sustain and improve these benefits.

Greenhouse gas: Gases, such as carbon dioxide, methane, nitrogen oxides, ozone, chlorofluorocarbons, and water vapor that regulate the heat balance of the earth. Due to industrialization, rising living standards and increasing population, energy need and fossil fuel use increase, and the amount of greenhouse gases increases accordingly. This increase exacerbates the natural greenhouse effect and causes the earth to get even warmer.

Herbarium: It is the place where dried plant samples are arranged and stored by a certain system. Plant samples collected from nature are press-dried and adhered on special cardboard. On the cardboard are the familial and species name of the plant sample and the place where the sample was collected,
the altitude and the date it was collected, the name of the person collecting the sample, the name of the person who named the sample and other information. Samples are grouped as species, genus and family. It is stored horizontally in special cabinets.

**Land cover:** Physical land cover, usually expressed in terms of vegetation or lack of vegetation. Although it is related to land use, these two terms are not synonymous.

**Land cover change:** The changes that occur in the land cover as a result of the use or management of the land by people.

**Land use:** 1. Types of human use of an area such as residential, park, commerce, industry, reinforcement areas. 2. Management, modification and processing of the land in order to transform the natural or wild environment into a residential area or semi-natural areas such as groves, rangelands and cultivated fields.

**Natural resources:** Resources that exist without any actions of humankind and occur depending on certain conditions in the natural environment. Air, water, soil, vegetation, animals, and minerals are the natural resources of the world. Natural resources of the world are vital for the survival and development of the human population.

**Nature-based solutions:** Actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits (IUCN).

**Population:** A group of individuals of the same species living in a particular area.

**Population Dynamics:** Investigation of time-dependent numerical changes in the population and their reasons.

**Rangeland:** 1) Land allocated to one or more villages or towns to graze their animals, separately or jointly, and to take advantage of the vegetation. 2) The place allocated for grazing and vegetation benefits or used for this purpose since ancient times.
**Recycling**: The process of converting the waste resulting from human consumption, which can be reclaimed, into a secondary raw material with some chemical and physical processes and including these secondary substances in the production process. Materials such as paper, cardboard, glass, plastic and metal can be recycled.

**Renewable energy**: Energy obtained from the energy flow that exists in the natural processes that are continuous. Renewable energy sources can be listed as solar energy, wind energy, geothermal energy, hydraulic energy, biomass energy and hydrogen energy.

**Sociology**: A discipline that studies the interaction of society and human; social science.

**Sustainability**: Meeting the needs of the present without compromising the ability of future generations to meet their own needs.

**Sustainable development goals**: A collection of 17 global goals designed to be a blueprint to achieve a better and more sustainable future for all and to address the global challenges related to ending extreme poverty, protecting the planet, and ensuring that all people live in peace and justice by 2030.

**Taxon**: The common name of all units organized in a hierarchy from the domain to the subspecies in the classification of living things.

**Water cycle**: The name given to the general cycle of water from the oceans and seas to the atmosphere, from the atmosphere to the earth and back to the seas and oceans.

**Waste**: 1. All of the substances that occur at all stages from production to consumption and are no longer useful to the user. 2. Any substance or material, which is discharged or left in the environment by the producer or the real or legal person that actually possesses the item, or which must be disposed of (Waste Management Regulation of the Ministry of Environment and Urbanization).

**Zoology**: Animal science. A sub-branch of biology that examines animals in various aspects (habitats, life history, behaviors, feeding, breeding, etc.).
“Conservation and Sustainable Management of Turkey’s Steppe Ecosystems Project”
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