European Environment Agency

Europe's biodiversity

– biogeographical regions and seas

Biogeographical regions in Europe

The Steppic Region

– the plains of Europe

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Summary

- Vast steppic areas with a tree-less vegetation dominated by *Stipa* and other turf grasses growing on black soils
- Heavily influenced by human activities as conversion of the steppe into arable land, regulation of waterways, constructions of dams, salinisation and pollution from mining activities
- The Volga delta offers breeding grounds for many birds species
- Uncontrolled use of biological resources has diminished animal populations, several species are listed as vulnerable or endangered, among them sturgeons

1. What are the main characteristics and trends of the Steppic biogeographical region?

1.1 General characteristics

1.1.1 Extent and boundaries

The Steppic region stretches from Bucharest in the west, across the lower section of the floodplain of the Danube, along the north of the Black Sea and the foothills of the Caucasus. It is bordered in the east by the northwest coast of the Caspian Sea and the Ural River. Its boundary in the north is the beginning of the wooded steppe, which is part of the Continental region. It represents the European part of the steppes, a continuous band as far as to the Altai mountains on the borders of Mongolia.

1.1.2 Topography/Geomorphology

The topography is characterised by low-lying plains and in the northwest undulating high plateaus. The maximum altitude of 375 m is reached in the Volga Hills, which descend steeply to the Volga river. Small river valleys are sharply incised into the uplands, whereas the numerous major rivers cross the lowlands in broad, shallow floodplains. East of the Volga is the Caspian depression, a vast plain covering a large proportion of the region, the lowest parts of which are about 30 m below sea level. The plain extends southwards through the Azov-Caspian isthmus to the foot of the Caucasus Mountains. The large Kuban and Kuma plains of the North Caucasus are separated by the Stavropol Uplands at heights of 300–600 m. Plains also lie north and north-west of the Black Sea where the coasts are low and furrowed by numerous ravines and river valleys, the mouths of which are often impeded by sandy spits. The mountains of southern Crimea form the only precipitous cliff areas. In the east and south, the coasts are steep and mountainous.

The rivers run through large areas of marsh and other wetlands and they generally have gentle gradients – the Volga, for example, drops only 300 m during its 3 530 km run from its source to its mouth. The 2 270 km Dnipr drops 220 m. Small saltwater lakes occur in the Black Sea Lowland and in the Crimea. Larger saline lakes occur along the coast. Known as limans, these bodies of water formed at the mouths of rivers are blocked off by sandbars from the sea. There are several other lakes in the Caspian plain, the largest of which is Lake Elton covering 150 km^2. It is highly saline and has no outlet. There are eight large reservoirs in the region all with surface areas larger than 250 km^2.

The substratum of the steppes is extremely uniform. It is made up of a thick layer of loess, which was deposited during the Pleistocene, being on the perimeter of the ice covered regions to the north. The layer of loess can be up to 50 m thick, it is calcareous and permeable though percolation is slow.

Table 1. Statistics for the Steppic biogeographical region.

Surface area (km^2)	Number of countries in region	National composition by area	Population (inhabitants/km^2)
1 150 000	5	European Russian Federation 59 % Ukraine 25 % Western Kazakhstan 12 % Romania 3 % Moldova 1 %	European Russian Federation 27 Ukraine 80 Western Kazakhstan 6 Romania 66 Moldova 128

Sources: various sources by ETC/NPB and EEA.

Map 1. The Steppic biogeographical region.

Source: UNEP/Grid Warsaw.

1.1.3 Soils

The distinctive soil of the steppe is chernozem (black earth). It is characterised by an about one meter thick layer of humus, which is the result of the particularly high productivity of the steppic vegetation – especially the roots – and its subsequent decomposition. The high activity of the soil fauna, notably earthworms as well as of rodents such as sousliks is an important element in the formation of these particularly fertile soils. The most fertile chernozems are to be found north of the region in the wooded steppe, reaching a depth of up to two metres (see the Continental Biogeographical Region). In the steppes the soils grow progressively shallower and poorer in humus towards the south as they become increasingly mineralised. In the south, salinisation is prevalent. Towards the Black Sea chestnut soils are present. Chestnut soils (Kastanozems) are less black and less deep humus layer at the top than

the Black soils and has an accumulation of secondary carbonates.

All these soils are very fertile when sufficient water is available. Their intensive cultivation, especially on steep slopes, has led to widespread soil erosion.

1.1.4 Climate

The delimitation of the steppic zone is mainly determined by its climatic condition. Hard frosts in winter act as an 'ecological filter' restricting the distribution of species and the low precipitation excludes forest vegetation. The amount of precipitation is ca 150–400 mm. Precipitation in winter falls mainly as snow. The humidity in the region, particularly in the eastern parts, originates mainly from melting snow. In the west and northwest the precipitation reaches a peak in early summer, which is then followed by two or three months of drought. In the southeast, it falls evenly throughout the year and the high summer temperatures ensure rapid evaporation and a relatively long period of drought. In the semi-desert near the Caspian Sea the period of severe aridity lasts for up to seven months of the year.

January temperatures in the region varies between –3° and –14 °C, temperatures for July are 20°–23 °C. There is not only a big difference between summer and winter temperature but also during the summer. During the summer the temperature can vary up to 30 °C over a period of 24 hours. Hot winds are common, particularly in the southeast of the region. The southern shore of the Crimea is quite different from the rest of the region and has a warm, Mediterranean-type climate. Winters are mild and rainy, with little snow, and the average January temperature is 4 ºC. Summers are dry and hot, with an average July temperature of 24 ºC.

1.1.5 Human presence

The steppes have for centuries provided a favourable environment for nomadic pastoral activities. Fires and over-grazing probably decreased the area covered by wooded steppes and may have caused some land degradation on the fringes of the zones to semi-deserts. However, the steppes remained relatively unchanged by human activities for centuries, their exploitation being, on the whole, sustainable. The vast open spaces served an important role for migrating populations. Extensive ploughing of the steppes only began in the 19th century. Today 75 % of the total area has been converted into arable land.

1.2 Habitats, fauna and flora

1.2.1 Habitats

1.2.1.1 Steppes

The natural steppe vegetation is composed mainly of turf grasses such as bunchgrass, fescue, bluegrass and *Agropyron* species. Perennial grasses, mosses, and lichens also grow on the steppe, and drought-resistant species become common in the south. Much of the steppe vegetation, particularly in the west, has been replaced by grain cultivation.

The term 'steppe' designates areas in a temperate climate, covered with drought and evaporation resistent herbaceous plants dominated by grasses, where trees are absent. Steppic vegetation is dominant in the region, though woodlands – occurring in humid areas in river valleys and landscape depressions – are by no means completely absent. There are various reasons for the absence of trees in the typical steppic landscape: low precipitation and high rates of evaporation are not the only elements to be taken into consideration, since where the Russian steppes begin there is as much as 500 mm of rainfall. The permeability of the ground is an important factor and in some places the wooded steppe has probably regressed because of overgrazing by herds of wild and domestic animals, as well as fires linked to pastoral activities.

In the steppes an antagonism exists between grasses and herbaceous plants, similar to that found between grasses and trees in the savanna. But in the case of the steppes, trees form groups in favourable spots, and are never scattered individually in the grassland. Thus, the steppes represent a unique ecosystem as well as in its appearance as in its structure. The wealth of biological diversity in the steppes is partly due to the fertility of the soil but also the spatial structuring according to the season and the location of the various ecological niches.

Table 2. Main habitat types in the Steppic biogeographical region, as defined by EUNIS (European Nature Information System) habitat classification.

Habitat type	Proportion (%)
Regularly or recently cultivated habitats and gardens	75 %
Grasland habitats	17 %
Constructed industrial and other artificial habitats	3 %
Freshwater aquatic habitats	3 %
Woodland and forest habitats and other wooded lands	2 %

Sources: ETC/NPB, estimation based on 51 % of the region.

Table 3. The number of vertebrate species (excluding fishes) found in the Steppic biogeographic region and the number of species threatened at the European level.

	Total	Mammals[1]	Breeding birds	Amphibians	Reptiles
Number of species	377	59	265	16	37
Number of threatened species at European level	96	15	81	0	0

Source: ETC/NPB. [1]Excluding cetaceans. Only 3 % of the total area of the Steppic region is covered by the European Atlas of Mammals.

1.2.1.2 Wetlands

Europe's largest river system, the Volga is over 3 500 km in length and drains an area of 1 360 000 km^2. It rises in the Valdai Hills, northwest of Moscow, and discharges into the northern Caspian sea through a huge delta comprising more than 800 channels and with a seaward boundary over 200 km long. The Volga delta is of international importance for wildlife conservation, its 652 000 ha area is designated as a Ramsar site and contains a Biosphere Reserve. In the lower Volga, extensive wetlands are found on the floodplain downstream of Volgograd. The delta and floodplain of the lower Volga are exceptionally

rich and diverse wetland habitats containing some 430 vascular plant species, over 250 bird, and 60 mammal species, including the Caspian seal (*Phoca caspica*).

*The Caspian seal (*Phoca caspica*), a species listed as vulnerable on the IUCN red list occurs in the Volga delta. The image shows* Phoca vitulina *a close relative. Source: www.terrambiente.org.*

West of the delta, the shallow sea supports extensive underwater meadows of stonewort and brittlewort (*Chara* and *Nitella*), which are the main forage of the 350 000 or so mute swans (*Cygnus olor*) that visit the area in summer and autumn. A rich diversity of fish-eating birds depends upon the productive fish resources of the Caspian shores. Approximately 40 000 pairs of great black-headed gulls (*Larus icthyaetus*), 80 % of the world's entire population, breed in the Caspian wetlands, together with approximately 6 000 pairs of Sandwich terns (*Sterna sandvicensis*) and 250 pairs of Dalmatian pelican (*Pelecanus crispus*).

*Sandwich tern (*Sterna sandvicensis*) breeds in high numbers in the Volga delta. Photo: G. Gerra & S. Sommazzi – www.Justbirds.it.*

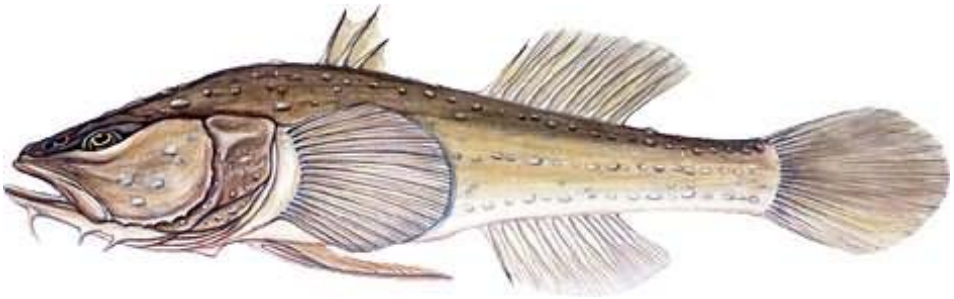
The Volga River estuary is of central importance for landscape diversity in the region. Volga and Kuban River delta areas as well as adjacent areas of the Caspian and Azov Seas are rich in waterfowls and are of international significance for the preservation of several species populations as well as for migration routes. Among fish, the sturgeon

family is of particular importance in the region.

1.2.2 Fauna

The absence of natural shelter on the steppes has conditioned the kind of animals living in the region and there are many specialised grassland mammals and birds, which are found nowhere else in Europe. The fauna of the steppe zones now lacks large animals, e.g. the saiga antelope (*Saiga tatarica*) has disappeared. Numerous rodents, including the marmot (*Marmota marmota*), jerboa (*Jaculus* spp.) and field mouse (*Apodemus sylvaticus*), have increased in numbers and are today often considered as pests, especially so when nearly all the steppe is under cultivation. Equally plentiful birds include the bustard (*Otis tarda*), quail (Coturnix coturnix) and grey partridge (Perdix perdix). Eagles, falcons, hawks, and kites comprise the birds of prey; water and marsh birds, especially the crane (*Grus grus*), bittern (Botaurus stellaris), and heron (*Ardea cinerea*) also make their homes in the steppes. Invertebrates are numerous. In the Russian part of the region there are almost 300 species of the *Carabus* genus alone.

Freshwater fish and marine/brackish water fish species that migrate from the sea to spawn in freshwater (anadromous) are extremely diverse (carp, herring and sturgeon families). They include a relatively high number of endangered species – for example, the Ukrainian lamprey (*Eudontomyzon mariae*), the Azov white sturgeon (*Huso huso maeoticus*), the ship sturgeon (*Acipenser nudiventris)*, sterlet (*Acipenser ruthenus*), the Abrauz sardelle (*Clupeonella abrau*), Volga herring (*Alosa kessleri*) and white salmon (*Stenodus leucichthys*). Freshwater and anadromous fish species of the Caspian Sea basin are diverse with endangered species accounting for about 14 % (for example, the Caspian lamprey (*Caspiomyzon wagneri*), *Alburnoides bipunctatus*, and *Stizostedion volgensis*. An example of a regional endemic is the genera *Benthophilus*.



Benthophilus macrocephalus. *Source: www.ittiofauna.org*

A major section of the migration routes of Eurasian bird species include the Volga River valley and delta, the Caspian Sea northern coast and the Kumo-Manychskaya lowland lake network. Northern Caspian is the meeting point for migrating birds species that overwinter in the area, as well as at the Black and Mediterranean Sea coasts, in Asia Minor, Trans-Caucasia and Africa, while nesting in the north-east of Europe and western Siberia.

1.2.3 Flora

Different vegetation belts form rings in the Caspian depression. Approaching the coast of the Caspian Sea, aridity increases and there is a succession of different species adapted to varying degrees of drought. A similar, though not so marked zonation can be observed around the northwest of the Black Sea.

Feather grasses of the genus Stipa *is well-represented in the Steppic biogeographic region. Photo: Dragiša Savic, www.naturefg.com.*

The steppes are dominated by a number of grass species in the genera *Stipa,* accompanied by *Festuca, Agropyrum, Koeleria, Andropogon* and *Helictotrichon.* They can be grouped into distinct belts, from the northwest to the southeast. Adjacent to the wooded steppes are the grass steppes, rich in tall grasses and Dicotyledones such as *Ferula, Verbascum,* and Dipsacaceae with additional few bush species such as plums (*Prunus divaricatus*) and almonds (*Amygdalus nanus*). Next, the medium steppes where *Stipa* (mainly *S. joannis* and *S. lessingiana*) are accompanied by *Festuca sulcata* and numerous other grass-species, spring flowering bulbs (*Tulipa, Gagea*) and Dicotyledones (*Potentilla, Astragallus*). This zone is followed by the dry steppes, with a dominance of *Artemisia*. Here the soils exhibit traces of salt, being revealed by the presence of salt tolerant species of the goosefoot family (Chenopodiaceae).

Stipa *is an important species forming the vegetation of the steppe. Photo: Michael Ignatov.*

The next zone is a belt of semi-desert, to be found the depression surrounding the Caspian Sea. In the northern part, the characteristic vegetation is formed by *Tanacetum achilleifolium* and *Agropyrum desertorum* with *Festuca* and *Artemisia* still present. The micro-relief of the plain is uneven and marked by numerous bumps and hollows. A more drought resistant type of vegetation is found on the summits of the protuberances with *Artemisia, Kochia* and lichens such as *Parmelia*. However, hollows act as enclaves of steppic vegetation with *Stipa* and *Koeleria.* Salty lagoons are surrounded by rings of Chenopodiaceae, in decreasing order of salinity: *Halocnenum, Salicornia, Suaeda, Atriplex* and *Anabasis.*

The southern part is mainly formed of dunes, *Elymus racemosus* and *Salosa* being the pioneer species fixing the sand. Bushes such as *Eleagnus, Salix* and *Populus* are present in the more humid areas between the dunes. In saltier areas these genera are replaced by *Tamarix* and *Nitraria*.

Many species of *Stipa* have fluffy fruits to assist their wind-dispersal. Others are dispersed after being attach to the fur of animals. In the past, ungulates such as the saiga antelope and Przewalski's horse (*Equus przewalski poliakov*) provided an important contribution to their dissemination. Today, sheeps are the main dispersal agent.

2. Pressure on biodiversity

2.1 Main pressures on biodiversity in relation to human activities

2.1.1 Main pressures on biodiversity

In the steppic biogeographic region, industrial activities, expanding agricultural activities, diversion of water for irrigation and pollution by fertilisers and pesticides, as well as excessive fishing in many of the lakes, are all widespread problems. The degradation of the wetlands has been compounded by the drier conditions since the 1850s.

2.1.1.1 Agriculture

75 % of the region is composed of regularly or recently cultivated habitats. The majority of the steppes have been ploughed. In the Russian Plain steppes, anthropogenically transformed landscapes account for 90 % of the territory. The main crops in the Steppic biogeographic region are wheat, maize, oats, barley, millet, sugar beet and sunflower. Large areas are also utilised to grow vegetables. On the lower mountain slopes in the south, there are extensive vineyards and the cultivation of tobacco is important, as are flowers for perfume. In some areas pastoral activities remain dominant. In the Astrakhan district for example, only 5 % of farmland is arable, and relatively untouched steppes have remained east of the Volga. However, the intensive development of agricultural activities on the whole has resulted in the catastrophic decrease of steppe species populations (little bustard (*Tetrax tetrax*), bustard (*Otis tarda*) and marbled polecat (*Vormela peregusna*)).

Destruction and degradation of habitats are major threats to biological diversity in the region. Drastic fragmentation of habitats endangers the preservation of genetic diversity and intensive farming has resulted in severe pollution. The major rivers are all seriously polluted with chemical fertilisers and pesticides from agricultural runoff. Land degradation has occurred in some areas due to over-grazing. In other areas under-grazing has led to the invasion of scrub in the prairies. Afforestation has occurred in many parts of the region since the 1950s in order to counter soil erosion, protecting fields and riverbanks.

2.1.1.2 Regulation of inland waters

Dams and hydroelectric plants are situated on all the larger rivers. The freshwater flow into the Sea of Azov has been largely diverted for irrigation purposes, leading to a sharp increase in salinity in the sea.

Volga

The natural character and functioning of the Volga ecosystems have been radically altered by the regulation of river flow through the construction of dams for hydroelectric power generation, flood protection and the creation of storage reservoirs for irrigation. This has resulted in a serious decline in fishing yields and reduced frequency of flooding has caused reduced soil fertility. The fishing industry of the Caspian Sea and its major rivers, notably the Volga, accounts for 90 % of Russian sturgeon and 50 % of the world's beluga supply. Dams at Volgograd and Saratov have prevented the important migration of many fish to spawning grounds, which had been formerly as far as 1 500 km upstream. Now large spring floods are reduced by 25 %, which has had an adverse effect on wetland ecosystem functioning. Opportunities for fish to feed and spawn in the delta and floodplain have dramatically dwindled and food-chain support has declined through a reduction in water exchange and the sediment input, which maintain fertility. Now some 7 million tonnes of sediments are trapped every year in reservoirs of the Volga. Agriculture (rice paddies and reclamation of land into polders for irrigated cropping) has produced salinisation and contamination from fertilisers and pesticides. Major contributions to the pollution load are the extensive industrial, urban (e.g., sewage from Volgograd) and the agricultural developments within the wider catchment.

2.1.1.3 Industry and mining

The Donets Basin, situated in the bend formed by the rivers Don and Donets, is one of the largest mining and industrial regions of southeastern Europe, notable for its large coal reserves. The principal exploited area of the coal field covers nearly 23 300 km^2. Coal was first discovered in the Donets Basin in 1721, but exploitation did not begin until the early 19^{th} century and became significant only after the first railway was built in the area in 1869. Coal production continued to increase until the 1970s. Annual production then declined from 221.5 million tons in 1975 to 139.4 million tons in 1992. The region hosts more than 100 mining communities. There are still has large coal reserves, much of it of high quality. The thicker seams and those nearer the surface have been excavated.

During the 1880s the Donets Basin developed into Russia's principal iron and steel-producing region. The area remains one of the world's major metallurgical and heavy-industrial complexes. Iron ore is obtained from Kryvyy Rih to the west and from Kerch in the Crimea; manganese is mined at Nikopol and Marganets on the Dnieper. The chief iron- and steel-producing towns have a range of large heavy-engineering industries. The chemical industry is highly developed, based on coking by-products and rock salt mined in the Donets Basin. Mercury is also mined, and cement making is important.

Pollution of waterways is a serious threat to biodiversity in the region. Source: www.caspianenvironment.org

Some of the most polluted areas in the world are now found in the region and many major rivers are seriously polluted due to mining, industry, and a lack of effective pollution controls. Major rivers, including the Dnieper, Dniester, Inhul, and Donets, are seriously polluted with poorly treated or untreated sewage. In the Russian part of the Region annual total air discharges from stationary sources amount to about 1.8 million tonnes and 8.6 million tonnes of toxic waste are produced.

Threats to sturgeons and international trade in Caspian caviar

Huso huso*, a species heavily used for the production of caviar. Now listed as endangered on the IUCN red list. Photo: Ernst Hofinger Tier Präparationen.*

The region of the lower Volga and northern Caspian Sea are places for breeding, development and foraging for 76 fish species. More than 50 % of the species are endemic, and 40 of them represent commercial value. All sturgeon species are threatened and many are considered in danger of extinction and are included on the IUCN red list, while the *Huso huso* faces an extremely high risk of extinction in the immediate future. Experts believe world populations of sturgeon may have already declined with 50 to 70 %. While the decline has resulted partly from habitat degradation, several sturgeons are also beset by significant international demand, particularly for caviar. In recent years, heavy fishing to meet this demand has been the most important cause of this decline.

Caviar, the unfertilised eggs of female sturgeons, is a culinary delicacy and one of the most universally recognised symbols of exclusivity and wealth. The price of caviar makes sturgeon fisheries among the most lucrative in the world. Historically, North America supplied much of the world's caviar. Today, however, up to 90 per cent of the world's sturgeon catch and caviar comes from only three species in the Caspian Sea: Beluga *Huso huso*, russian sturgeon *Acipenser gueldenstaedtii* and stellate sturgeon *A. stellatus*. The Caspian Sea, the world's largest inland water body, is the centre of an increasingly lawless

sturgeon catch and caviar trade, one characterised by poaching, illegal production and smuggling on a massive scale.

Although sturgeon are well protected from non-human predators by their bony exteriors, sturgeon populations are extremely vulnerable to overfishing because they only reach sexual maturity at between six and twenty five years of age and have a limited number of spawning grounds. In the Caspian Sea, the sturgeons' access to natural spawning grounds in the sea's tributaries has been blocked in several places by dams, reservoirs and other river modifications. In the lower Volga River sturgeon have lost 85 per cent of their natural spawning grounds. The sturgeons spend most of their life in the Caspian sea. Belugas can reach a length of six metres, a weight of 1200 kilos, and live for 150 years. One beluga female may produce up to 12 per cent of her body weight in caviar. Mature sturgeons migrate upriver in the Volga, Ural and Terek.

The dissolution of the USSR led to dramatic changes in the Caspian sturgeon fishery. Prior to 1991, the Caspian was bordered by only the USSR and Iran, which together tightly controlled the fishery. Since the collapse of the USSR subsequent lifting of fishing restrictions or lack of enforcement of those that do exist has led to an uncontrolled harvest of sturgeon for caviar, as well as illegal production and trade. Current fishing is extensive and the methods used are often those outlawed by the previous Soviet government. Fishing on the open sea, once banned, is widespread. In Azerbaijan, there were six times as many nets in use in 1993 as there were in the 1980s. In Russia, there is widespread illegal fishing. In 1994 alone, Russian authorities detained 1452 poachers and confiscated more than 110 tonnes of sturgeon and five tonnes of caviar. During the same year in Astrakhan, the centre of Russia's caviar production, seven illegal caviar-processing plants were shut down. The threat to sturgeon is strengthened by the indiscriminate methods used by poachers on the Caspian Sea. In 1996 the Ministry confiscated 6.6 tons of black caviar, 36 tons of sturgeon meat and 155 tons of other breeds of fish.

Experts and fisheries agents in Russia concur that sturgeon stocks are rapidly declining in the Caspian Sea basin. In 1980 20 000 tons were officially caught, whereas this number was reduced to merely 600 tons in 1999. The number of sturgeon travelling upriver to spawn is also indicative of declining populations. An estimated 25 000 belugas used to migrate up the Volga River to spawn each year in the early 1970s, but this number did not exceed 11 700 by the early 1990s. In the Ural River, migrating stellate sturgeon once numbered one million but declined to 200 000 by 1991 and has since fallen sharply.

To compensate the loss of spawning places and decrease in number more than ten sturgeon hatcheries were established in the 1970s. At present many of these have declined or even stopped their activity because of economic difficulties, shortage of modern technologies and decrease of availability of mature fish. As a result, the number of juvenile sturgeons dispersed from hatcheries is presently less than one third of the amount necessary to maintain their population. A renewed augmentation of the fish stocks is possible only through regeneration of the hydrological regime of the Volga river, and by rehabilitating the natural and artificial breeding conditions in region of Lower Volga. An agreement between the Caspian states on sturgeon catches is urgently needed. It should include agreements on national quotas, seasons of haul, establishing closed zones, etc. The economic value of the fish stocks may serve as the important stimulant for a rational management and as a source of financing the sustainable use of these resources in the future.

Source: TRAFFIC Europe report, November 1996: 'Sturgeons of the Caspian Sea and the International Trade in Caviar'*, available from the Internet at <www.traffic.org/publications/sturgeons.html#top>. Michael A. Shubin from the Volga Water Resources Research Institute has kindly contributed to the text.*

2.2 Initiaves for biodiversity and conservation in the Steppic biodiversity region

2.2.1 Nature conservation policy

There are five MAB-Biosphere reserves in the region: The Danube delta, Chernomorskiy, Astraniya-Nova (Ukraine) and Chernyje-Zemli and Astrakhanskiy (Russian Federation).

Ukraine's first nature reserve, Askaniya-Nova, began as a private wildlife refuge in 1875. It was designated as a national park in 1919 and redesignated as a reserve in 1921. This reserve, occupying about 110 km² protects a portion of virgin steppe, with characteristic fescue and feather grasses. Some 40 different mammals, including the onager (*Equus hemionus onager*) and Przewalski's horse, have been introduced as part of a program of breeding endangered species. The Ukrainian Steppe reserve is discontinuous, comprising three separate sections, each of which preserves a special type of steppe: the Mykhayliv (virgin meadow steppe), the Khomutovsky (chernozem, or black-earth, steppe), and the Kamyani Mohyly (a stony steppe). Other reserves in Ukraine protect segments of the forest-steppe woodland, the marshes and forests of the Polissya, and sites of mountains and the rock coast in the Crimea.

Among the other important reserves, the Black Sea Nature Reserve was established in 1927. It covers 360 km², including protected areas of the sea. It is among the most visited reserves in Ukraine, the attractions including many species of waterfowl, and is the only breeding ground in Ukraine of the Mediterranean gull *Larus melanocephalus*.

The Mediterranean gull (Larus melanocephalus*) has its only breeding site in Ukraine in the Black Sea Nature Reserve. Photo: Marten van Dijl.*

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