Landscapes of Dauria

Potential Serial Transnational World Heritage Property
(The Russian Federation and Mongolia)

Each State Party to this Convention recognizes that the duty of ensuring the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage situated on its territory, belongs primarily to that State. It will do all it can to this end, to the utmost of its own resources and, where appropriate, with any international assistance and co-operation, in particular, financial, artistic, scientific and technical, which it may be able to obtain.

UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage

Khaichiin tsagaan lake

Introduction

Adopted on November 16, 1972, the Convention concerning the Protection of the World Cultural and Natural Heritage is the most efficient and representative among existing nature conservation conventions and programs. The primary purpose of the Convention is to unite the efforts of the international community to identify, protect and provide comprehensive support to cultural monuments and natural objects of Outstanding Universal Value.

Established in 1976, the World Heritage List represents both diverse regions on our planet and a number of specific properties. Many natural properties of worldwide renown are protected under the World Heritage Convention, including the Great Barrier Reef, Galapagos Islands, Hawaiian Islands, Grand Canyon, Mount Kilimanjaro, Victoria and Iguazu Falls.

Untouched by economic activities and significant in size, the natural World Heritage properties represent valuable and important strategic natural reserve of humankind. The fact of unique voluntary contribution of any state into the joint "humankind's bank of nature" positively affects the state's image.

Russia is currently represented on the World Heritage List by fifteen cultural and ten natural properties. Russia's natural World Heritage properties are the Virgin Komi Forests, Lake Baikal, the Volcanoes of Kamchatka, the Golden Mountains of Altai, Western Caucasus, Central Sikhote-Alin, the Uvs Nuur Basin, the Natural System of Wrangel Island Reserve, the Putorana Plateau, and the Lena Pillars Nature Park. Thirty-two of Russia's specially protected nature areas, among which twelve are nature reserves and five are national parks, have World Heritage status. The total area of Russian natural World Heritage properties comprises more than 23.7 million ha. Two of Russia's natural properties, Lake Baikal and the Volcanoes of Kamchatka, are ranked in the top 10 largest properties worldwide, they are included in the World Heritage List according to all natural criteria requirements. Work is currently being carried out to present more of Russia's natural sites for inclusion in the World Heritage List. The Magadan Nature Reserve, the Commander Islands, the Daurian Steppes, the Krasnoyarsk Pillars, the Great Vasyugan Mire, the Il'men Mountains, the Bikin River Valley, and Bashkir Ural are all included on the Russian Federation's Tentative List.

Without doubt, Russia possesses wealth of unique natural complexes untouched by economic activity of man. Scientists have assessed that the country houses over 20 territories worthy of holding a status of World Heritage properties.

Mongolia is currently represented in the World Heritage List by two cultural properties, and one natural property, - Uvs Nuur Basin, which consists of five sites with the total area of 810 233 ha. Four natural properties are included on the Mongolian's Tentative List: Gobi Gurvansaikhan Desert Fossil, Great Gobi Desert, Mongolia Sacred Mountains (Bogd Khan, Burkhan Khaldun, Otgon Tenger), and Mongolian Daurian Landscape.

It is important to note that cooperation between Russia and Mongolia under the Convention is an excellent example of successful and fruitful transnational cooperation. In 2003 the first Mongolian-Russian nature property Uvs Nuur Basin was included in the List. Due to successful joint management this complex territory consisting of 12 component parts that are remote from each other, protection and conservation of this property is maintained at a very high level. Development of the second transnational nomination "Landscapes of Dauria" has been completed in 2013 and submitted to the World Heritage Centre for the Committee's consideration in 2015. Implementation of an ambitious project of the cross-border expansion of the Russian serial property, the Golden Mountains of Altai, by means of inclusion of border SPAs of Mongolia, Kazakhstan and China has been started. Finally, the possibility of expansion of the Russian natural property, Lake Baikal, by means of adjacent Mongolian Lake Khubsugul, an ancient lake of Baikal type known as "Baikal s smaller brother", is currently under study.

The present booklet contains materials from the nomination dossier of Landscapes of Dauria prepared in 2003 – 2012 by the following institutions: Natural Heritage Protection Fund, Daursky State Nature Biosphere Reserve, Institute for Cultural and Natural Heritage, Institute of Geography of the Russian Academy of Sciences (all – Russia), Institute of Biology and Institute of Geography of the Mongolian Academy of Sciences, Mongol Daguur Strictly Protected Area (Mongolia), International Academy for Nature Conservation, Isle of Vilm, Dresden University of Technology (Germany). Development of this project is supported by Federal Agency for Nature Conservation (BfN) (Germany), Greenpeace, (Russia); World Wildlife Fund (WWF) Amur Branch, (Russia) and UNDP/GEF Steppe Project.

The nominated territory is the first component part of the serial transnational property to be expanded in the future by addition of new component parts representing other protected areas of the Daurian ecoregion, which includes not only the steppe areas and wetlands but forest-steppe regions as well.

The Daurian ecoregion is the only region in the world where the transition of the ecosystem complex from the circumboreal taiga forest biom to the temperate continental grassland biom remained completely under natural conditions. It is characterized by a cyclic changing gradient of climate conditions from cold humid taiga forest climate to strong continental semiarid steppe climate, by extraordinary diversity of different ecosystems and species, which are adapted to extreme cyclic changes of life conditions. The proposed property represents the "steppe compartment" of the complex ecoregion; it includes large and small lakes and wetlands in a unique landscape feature.

Cyclic climate changes of wet and dry periods are the reason for extreme changes of water supply in the closed Torey Lakes basin as well as extreme changes of life conditions for plants and animals. The adaptation of ecosystems and species populations in the ecoton is an on-going biological and ecological process of global importance.

The nominated property with the large steppe lakes is the key resting place for more than 3 million migrating birds within the East Asian-Australian flyway of waterfowl, one of the most important and longest flyways all over the world. A total of 16 globally endangered bird species inscribed in the IUCN Red List have been observed in this territory. The territory is of key importance for conservation of natural massive transboundary migration routes of dzeren, which is the last grandiose phenomenon of this type in Central Asia.

Red-crowned Cranes and Swans on a steppe lake

Nomination Landscapes of Dauria

The Borzya River valley

The First Property
of the Serial Transnational Nomination

LANDSCAPES of DAURIA

(THE RUSSIAN FEDERATION and MONGOLIA)

Proposal for Inscription on
THE UNESCO WORLD CULTURAL
AND NATURAL HERITAGE LIST

Prepared by:
- Natural Heritage Protection Fund, Russia
- Daursky State Nature Biosphere Reserve, Russia
- Institute of Biology and Institute of Geography of the Mongolian Academy of Sciences
- Mongol Daguur Strictly Protected Area, Mongolia
- Institute of Geography of the Russian Academy of Sciences
- International Academy for Nature Conservation, Isle of Vilm
- Dresden University of Technology, Germany
- Institute for Cultural and Natural Heritage named after D.S. Likhachev, Russia

Supported by:
- Federal Agency for Nature Conservation (BfN), Germany
- World Wildlife Fund (WWF), Amur Branch, Russia
- UNDP/GEF Steppe Project
- Greenpeace Russia

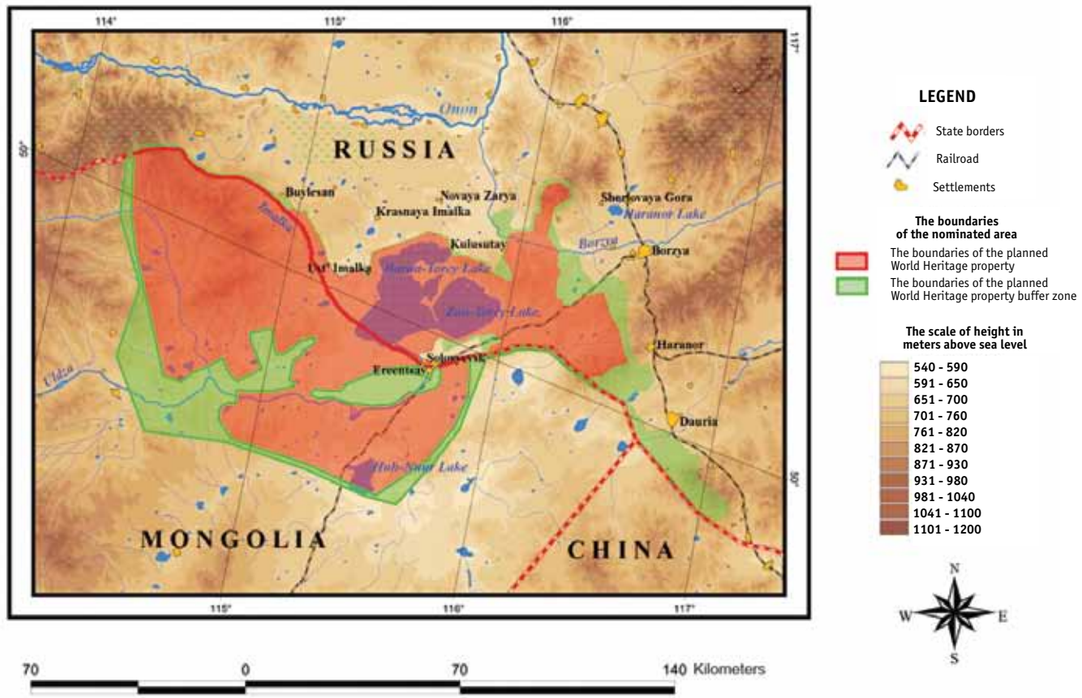
2013

1. Identification of the property

1a. Country (and State Party if different)	The Russian Federation and Mongolia.
1b. State, Province or Region	The Russian Federation: Zabaikalsky Krai, Onon, Borzya and Zabaikalsk districts. Mongolia: Dornod-Aimag, Chuluunkhoroot, Dashbalbar and Gurvanzagal districts.
1c. Name of Property	Landscapes of Dauria
1d. Geographical coordinates to the nearest second	The nominated property is located in the Torey Basin of the Daurian Ecoregion; it includes the Mongolian Daurian (Mongol Daguur) Strictly Protected Area with part of its buffer zone on the territory of Mongolia, Daursky State Nature Biosphere Reserve with its buffer zone and part of the Federal Nature Refuge "The Valley of Dzeren" in the territory of Russia. Geographical coordinates of the nominated property: The most easterly point – 50° 03′ 25″ N, 116° 35′ 15″ E; The most southerly point – 49° 28′ 27″ N, 115° 39′ 35″ E; The most westerly point –50° 13′ 49″ N, 114° 09′ 37″ E; The most northerly point – 50° 30′ 40″ N, 116° 03′ 53″ E.
1e. Maps and plans showing the boundaries of the nominated property and buffer zone	Appendix A contains the following maps and plans: 1. Location of the nominated property on the map of Eurasia. 2. Map with the exact indication of the boundaries of the nominated property and its buffer zone. 3. Scheme of the ecological network of protected natural areas of the Daurian Steppes ecoregion. 4. Nesting sites and rookeries of rare bird species. 5. Dzeren distribution area in the Zabaikalsky Krai and Eastern Mongolia.

Fig. 1. Location of the nominated property on the map of Eurasia

Fig. 2. Map with the exact indication of the boundaries of the nominated property and its buffer zone



1f. Area of nominated property (ha.) and proposed buffer zone (ha.)

№	Special Protected Area	Area, ha	
		Nominated property	Buffer zone
RUSSIAN FEDERATION			
1.	Daursky State Nature Biosphere Reserve	49 764	124 929
2.	Buffer zone of Daursky State Nature Biosphere Reserve	117 690	
3.	Federal Nature Refuge “The Valley of Dzeren”	111 568	
	Total area in the Russian Federation:	**279 022**	
MONGOLIA			
4.	“Mongol Daguur” SPA part A	87 780	185 790
	“Mongol Daguur” SPA part B	15 236	
5.	Buffer zone of “Mongol Daguur” SPA	477 064	
	Total area in Mongolia:	**580 080**	
	Total:	**859 102**	**310 719**

2. Description

2a. Description of Property

THE NOMINATED TRANSBOUNDARY PROPERTY IS LOCATED AT THE BORDER BETWEEN the Daurian forest steppe ecoregion and the Mongolian-Manchurian grassland ecoregion in the area of Terrestrial Ecoregion from the List of Global 200.

GEOLOGY

Marine and continental sediments, which stratigraphic characteristics and age validation are still the subject of discussions have been detected in the Daursky Reserve and "The Valley of Dzeren" Refuge.

The marine stage (Proterozoic – Late Triassic) is represented by various paleontological remains of sediments of the Late Proterozoic, Early Devonian, Early–Middle Devonian, Early Carboniferous and Late Triassic seas.

The Proterozoic sediments are considered to be the most ancient marine sediments within the reserve and the refuge, as opposed to other marine sediments, they are allocated conditionally as either fossils or data of their absolute age are not available. They include intensively changed argillaceous, sand and volcanogenic formations (phyllites, various shales, jasperoids, quartzite, etc. detected at the eastern and north-eastern shoreline of the Zun-Torey lake). The sediment thickness is up to 3–4 km.

Devonian sediments were characterized by interesting findings. Thus, semi-rounded fragments of organogenic limestone with leached coral remains were found in the contemporary lacustrine sediments on the southern shore of the Zun-Torey lake. In all likelihood, those are the remains of Embolophyllum cf. Mansfiedense (Dun.) which indicate the time of Early–Middle Devonian. Based on paleoecology of corals and sea lilies, the following parameters can be reconstructed: a relatively small depth (namely, in the range of 15–20 m) of habitats and burial grounds, normal water salinity, absence of turbidity, and Subtropical climate. This reef is the only reef of branching tetracorals in the Zabaikalsky Krai region.

The continental period of development of the area (Late Jurassic – Holocene) is represented by the deposits in the Late Jurassic and Early Cretaceous, Miocene and Pliocene lakes and river systems and various paleontological remains of the Early, Middle and Late Pleistocene and Holocene.

The central part of the property area is occupied by the Late Mesozoic Torey and East-Torey (Ary-Bulak) depressions. The natural outcrops have been found in the same places (for example, in the northern part of lake Zun-Torey). Late Mesozoic deposits can be revealed by drilling and are overlapped by thick loose Cainozoic deposits in the rest of the territory. The shoreline cliffs of lake Zun-Torey in the Torey depression are mostly formed by basaltic andesite, basalts, and slimes with an almond-shaped or massive texture. The almond-shaped inclusions are represented by chalcedony, quartz, chlorites and calcite.

Pliocene lakes and river systems are characterized by deposits of the Torey suite forming a terrace on the northern shoreline of lake Barun-Torey. The complex of Pliocene diatomaceous algae Melosira, Cyclotella, typical for running water lakes and river systems of Boreal Climate was found within the suite sediments.

The Middle Pleistocene is represented by lacustrine sediments of terrace V of the Torey lakes formed by pebble stone, clay loams, sands with inclusions of gravel and pebble (up to 3 m thick). The Late Pleistocene is represented by alluvial sediments of four fluvial terraces above the flood plain and lacustrine sediments of terrace IV of the Torey lakes. The Muruktin horizon is represented by sediments of lacustrine terrace III of the Torey lakes (up to 9–15 m high). The Kargin (interglacial) and Sartan (glacial) horizons are represented by the sediments of lacustrine terrace II of the Torey lakes. The Upper Pleistocene–Holocene sediments form terrace I of the Torey lakes at the level of absolute altitude of 618–630 m, they are represented by lacustrine sands, gravel-pebble stone and gravel-break stone sediments over 3 m thick.

The Holocene sediments widely occur within the territory of the property and its buffer zone. They include the bedrock eluvium, colluvial-deluvial and proluvial sediments of the plains of temporary water flows, riverine alluvium, sediments of the floodplain of river valleys and meander cut-off, lacustrine sediments and wind-borne sediments.

Rock massif Adon-Chelon consists of Kukulbey granite porphyries and has been formed in the Carboniferous period as a result of tectonic uplift of the territory. The rocks were shaped by the process of gradual cooling and further destruction of the mountain massif.

Fig.3. The Adon-Chelon plot of the Daursky Reserve

Fig. 4. Mongol Daguur SPA

Relief

In accordance with the geomorphological mapping within the Eastern Zabaikalsky Krai region, six geomorphological zones have been distinguished: northern uplands, the Stanovoe Upland, the Vitim Plateau, the Zabaikalsky middle mountain area, the Khentii-Daurian Mountain area and the Uldza-Torey (East-Mongolian) flatland. The described area lies within the latter region and encompasses the border regions of Russia and Mongolia. In the context of relief structure and its development history, the Uldza-Torey flatland is a unique geomorphological region. In terms of its morphological structure, this area is the northern part of a larger Uldza-Khailar (Dalainor) flatland, an extensive intermountain depression of Gobi type, which is located in the adjacent areas of China, Mongolia and Russia. Its maximum length and width is approximately 600 km. The depression is located between the Zabaikalsky middle-height mountain area to the north and northwest, the Greater Khingan Range to the east and southeast and the Gobi plateau to the west and southwest. The average absolute height of the territory of nominated property and its buffer zone is 600–800 m and decreases down to 595 m at the Barun-Torey shore and 566 m near Huh-Nuur Lake, it increases up to 985 m on the north-east at the Tsagan-Oboo mountain and up to 1045.9 m at the Huh-Ula mountain on the west in Mongolian part. In certain areas the relief comprises hills ridges and uplands with the relative deviations ranging from ten to several hundred meters.

The Uldza-Torey flatland is a well-preserved ancient peneplanation plain with a weathered crust developed in some areas. Among the geomorphological regions, this surface was least affected by Neogene-Quaternary endogenous relief formation processes; the amplitude of neotectonic movements here varies between –100 and +200 m. In general, relative to the neighbouring rapidly uplifting morphostructures, the Uldza-Torey (also known as the Dalainor) flatland is a zone of relative submersion. One of the most significantly lowered plain regions is confined to the Torey lakes and lake Khukh-Nur.

Accumulative alluvial and lacustrine plains, steep slope surfaces and isolated low mountain massifs are the predominant types of the contemporary relief of the territory.

Modern small lakes are numerous. They often form chains according to geomorphologic structures. Traces of ancient and modern lakes are observed. Some lake hollows are narrow and long and reflect the shape of ancient valleys. Most of lakes are shallow, sloppy, with gentle shores. Khukh Nuur Basin (560 m above sea level), the lowest point of Mongolia is located in this area. Relief forms related to morphodynamic development are easily observed in this area. The coastal plain of Torey lakes consists of three lacustrine terraces: the first one is 20 m high; the second terrace is 35–40 m high and the third one is 50–60 m. Shore ridges located on the floodplain and the first lacustrine terrace above the floodplain are the typical relief form of the described territory. They were formed as the coastal line shifted due to the lake-level fluctuations. The number of ridges can be as high as 19–20 per slope. They can be from 0.5 to 2–3 m high and up to 20–30 m wide.

Granite ribs occur on the tops of some hills even though the hills are gently sloping and their tops are rounded. The uplands with the relative height of 100–150 m occur along the northern shore of lake Zun-Torey. The Kuku-Khodan hill is the highest point at the Russian part of the nomination property.

The relief of the Adon-Chelon massif located in the northern part of the nominated property differs from the rest of the area. Formed by the Late Jurassic granite porphyries s, the massif is a combination of deep valleys and high, heavily split rocks of odd shapes. The highest point of the massif, the Tsagan-Obo mountain is 985 m above the sea level.

Hydrography

The territory of the nominated property belongs to Pacific and Central Asian closed basins. Its hydrography is typical for arid areas of Inner Asia.

Fig. 5. The rocks of Adon-Chelon

The major rivers of this area are Uldza, Imalka and Borzya.

The Uldza river is one of the main rivers of Mongolia. Uldza springs from eastern low mountain hills of Khentii Mountain Range in Norovlin district of Khentii Aimag. It passes through to the wide steppe between Onon and Kherlen rivers and falls into Barun-Torey lake. The Uldza river collects water from the area of 27500 km^2; its total length is 428 km. Around 420 km of total length is in the Mongolian territory (Dashdeleg, Bat 1972). The Uldza river does not have any large tributaries while flowing through the Eastern Mongolian Plain. It somehow loses water because of evaporation. Ground waters predominate in its basin. The valley of the Uldza river is 3–6 km wide on average, the narrowest part is 1.5 km and the widest part is 15 km. It is 1–5 m wide in the head area and slowly getting wider (20–25 m). Some parts of it reach 40–50 m wide. It is a quite meandering river, with water depth of 0.5–2.0 m and average current speed 0.5–1.0 m/s. Sediment of the river bottom consists of gravel, rocks and mud (Dashdeleg, Bat 1972). Turgen, Duch and Sevsuul rivers flow into the Uldza river. According to the census of surface water in 2003, most of them dried up (Water census – Dornod-Aimag-2003). Also, there are many small rivers in the Uldza basin such as Berkh, Shuuduu and Teel. These rivers have been dry since 2004. The Borzya river flowing into the Onon river is the largest freshwater reserve of the Russian part of the nominated property and its buffer zone.

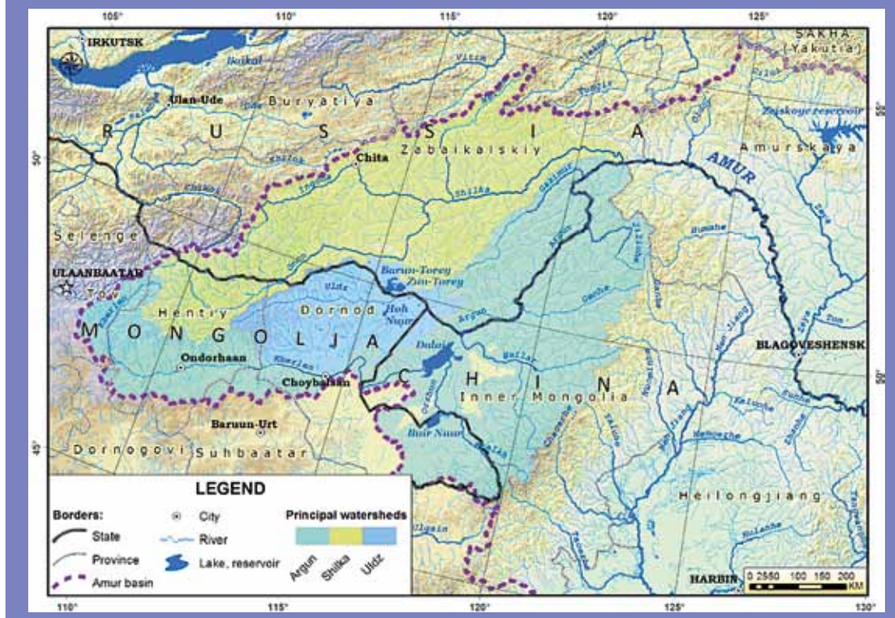


Fig. 6. Principal transboundary river basins of Dauria, (Adaptation…, 2012)

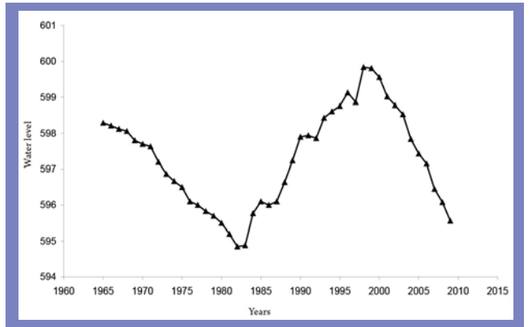


Fig. 7. Multi-year changes of water level of Barun-Torey Lake

A large number of small lakes, mostly of saline and soda types, are located within the territory of the nominated property and its buffer zone. During the wet period, the Torey depression contains over 500 lakes. There are about 50 lakes within the nominated property, including the largest ones, the Huh-Nuur and Torey lakes. Most of the lakes are closed and formed in depressions. Some lakes dry up during hot summer and become salt-marshes. The researchers' opinions regarding the origin of the lacustrine depressions vary. Some researchers consider small lakes to be relicts of the Praonon river bed, which changed its course northward, to the contemporary valley. According to another hypothesis, these lakes are the remnants of the dried-up Pratorey or the Daurian Sea of the Mesozoic basin. The assumption that a significant part of lacustrine depressions has a tectonic nature is the most convincing (Krendelev, Shamsutdinov, 1987). Some of the lakes of insignificant size (several meters in diameter) are of thermokarst origin. These basins occur to the north of the Barun-Torey lake.

Two lakes within the nominated property are recognized as natural heritage of regional importance: Borzinskoe Salt-Lake with collected over a long period self-deposited salt and Babye Lake well known for its sulphate mud used for medicinal purposes. Number of small and big lakes located at the property area and its buffer zone such as Khukh Nuur, Galuut, Angirt, Ih Davst, Duruu, Chukh, Haichiin yagaan, Bus, Galuutai, Khukh Nudnii etc. , are of great value for wetland wildlife, first of all for some hundred species of migrating birds.

The Torey lakes are the largest lakes in the Zabaikalsky region. In Eupleistocene, there was an extensive basin with water level higher than the contemporary level by 60–65 m. The size of the lake gradually decreased Now there are two interconnected basins (lakes Zun-Torey and Barun-Torey) with the total area about 850 km^2. They are closed lakes fed by two small rivers (the Imalka and Uldza rivers) and freshwater springs located at the bottom of the lakes and around them.

Barun-Torey Lake forms a single hydrological system with the lake Zun-Torey. The rivers feeding the lakes, the Uldza and Imalka rivers, are characterized by increased water salinity. They flow into Barun-Torey lake in the south and southwest. The major watershed of these rivers is mostly located within the territory of Mongolia. The lakes are interconnected via two arms that are 200–300 m long and 40–60 m wide. One of those is functional even during low water periods and it is known as Utochi river or Utochi arm. Water outflow from Barun-Torey lake into Zun-Torey lake begins at water level of 596.1 m BS. After the water level is balanced, the direction of water flow in the arms can be affected by wind and other factors.

The lakes are characterized by a fluctuating hydrological regime; the fluctuation period being mostly determined by the climate: over the past 200–220 years the lakes have repeatedly dried (four times in the XX century) and been filled again within a period of 25–40 years (Obyazov, 1994, 1996). The Fig. 7 shows changes of water-level of Torey lakes according to regular observations of hydrometeorological service.

Annual variation of water level of Torey Lakes is 14–95 cm and one or both of them completely dry up during drought years. The highest level of lake Barun-Torey was last observed in 1998. Since 2001, the level has decreased; in 2009 the lake dried up. Prior to 2009, the lake dried up almost completely in 1981. Constant seasonal fluctuations in the water level of the Torey Lakes have also been observed.

The Torey Lakes morphology differs significantly. The area of the completely filled Barun-Torey Lake is 552 km^2; its shoreline is strongly indented and has a lot of capes and bays. There are about ten islands in the lake; their numbers vary from year to year depending on the water level. The basin bottom is flat without any major changes in depth. As mentioned above, the Barun-Torey lake is fed by two rivers. The Uldza river (Uldz-Gol) flows into the lake in the south forming an extensive delta. As the delta reaches the boggy flatland it is divided into several arms, which disappear in the alluvial-lacustrine deposits. Only two of those, known as the Borokholoi and Uldza rivers have partially-developed beds. Water outflow in these arms is observed only during the abundant years. During the low-water seasons, the rivers may dry; during the winter season (December through March) they freeze over completely. The Imalka river, which carries less water compared to the Uldza river but has an appreciably wide flood-

Fig. 8. The bottom of the dried-up lake

Fig. 9. Smooth surface of Zun-Torey lake

Fig. 10. *Salicornia* thickets at Galutin-Nuur lake

plain, flows into the Barun-Torey lake from the western side. The shores of the Barun-Torey lake are slightly boggy; saline lands occur rather frequently in this area.

The Zun-Torey Lake has a round shape with weak indentation of the shoreline and one island, which becomes a peninsula as the water level decreases. The water surface area of the Zun-Torey lake is 285 km² with a maximum depth of 6.76 m; however, it can be as large as 300 km² (1999). The deepest points were reported to be located in the northern part of the lake. A rapid increase in lake area until it reaches depth of 1.0–1.5 m is typical of both Zun-Torey and Barun-Torey lakes. The level regime of the Zun-Torey lake is slightly different from that of the Barun-Torey lake, since its watershed is small and it has no surface tributaries.

At a high water level, when both lakes are interconnected via the Utochi arm, they have similar level regimes. In spite of the fact that the Zun-Torey lake loses water inflow through

Fig. 11. Davsan tsagaan lake

the Utochi when the water level decreases, the Barun-Torey lake is the first to dry up as it is shallower.

The bottom of the lakes is slimy; viscous or dense clayey silts occur at the depths of over 1.5 m. Raised from the bottom and stirred by storms and underwater currents, the silt is the reason for characteristic turbid, greyish-white water colour of the lake. It can be more transparent for a short period of ice melting. In summer, water transparency is no higher than 10 cm.

The ice cover melts before mid-May (the earliest date, April 15; the latest date, May 17). The lakes usually freeze in late October–early November. By mid-January, ice thickness is at least 1 m.

The lake has sodium hydrocarbonate-chloride waters. Water salinity strongly depends on water level. During the period of maximum filling, water is almost fresh; its salinity fluctuates within the range of 1–1.5 g/l. Salt concentration increases with decreasing water volume and reaches 17 g/l and more (Lokot' et al., 1991).

Water salinity in the Torey Lakes is not uniformly distributed over the basin, especially in the Barun-Torey lake. This is due to morphological characteristics of the lacustrine depressions: presence of isolated lagoons, bays, shoreline indentation, etc., as well as location of underground fresh water release. Furthermore, salinity differs in different seasons. During the freezing-over period, the salinity of under-ice water increases in proportion to the increase of ice thickness, attaining its maximum in March. This can be attributed to salt redistribution between water and the desalinated ice cover. The summer and winter salinity indices may differ by ~ 5 times.The biggest lake of the Mongolian part of the nominated property is the Huh-Nur Lake with area is 40.8 –70 km². Its shoreline is indented; there is a bay which disappears as the water level decreases. It is situated lower and its depth is greater than the Torey Lakes. In abundant period Huh-Nuur is connected with the Torey Lakes via Telin-Tsagan-Gol arm and the Uldza River.

Climate

The nominated area has ultra-continental climate with hot summers and dry and cold winters. The mean annual temperature is 0.6°C in the southern and –0.6°C in the northern part of the nominated territory. The climate is characterized by a distinctive feature – huge amplitude of temperature fluctuation, both daily and annually and non-uniform distribution of precipitation in the seasons. The warmest month is July (the average monthly temperature

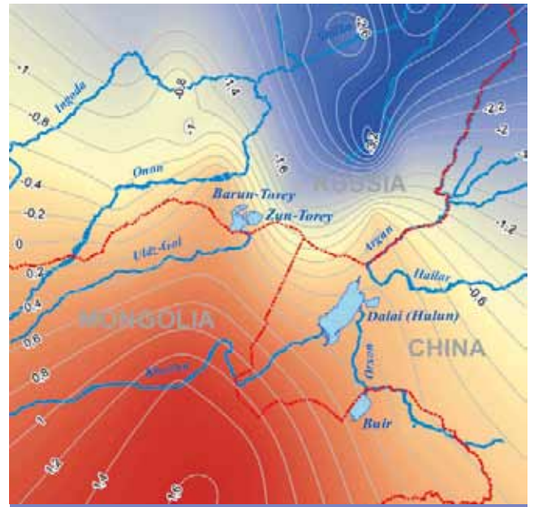


Fig. 12. Distribution of average multi-year annual air temperature in Dauria (Obyazov, 2012)

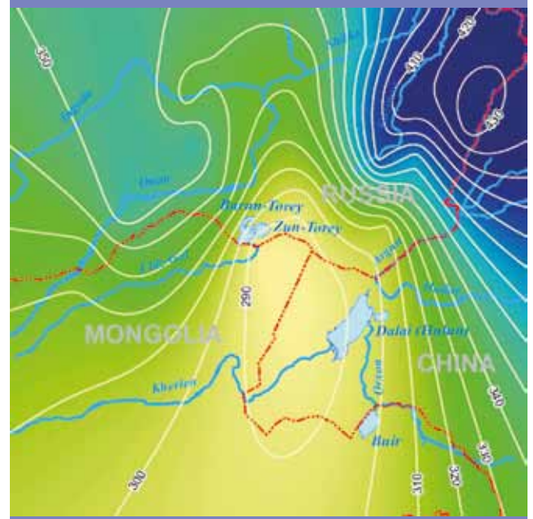


Fig. 13.Distribution of average multi-year annual precipitation in Dauria (Obyazov, 2012)

is 19–20°C; absolute maximum +49–50°C); the coldest month is January (the average monthly temperature is–24–26°C in the north and –19–23°C in the south; absolute minimum –50–55°C). Daily temperature difference reaches 15–20°C and annual – more than 90°C.

Annual precipitation varies in different parts of the Daurian region in the range of 150–350 mm (on average, 290 mm); about 80% of precipitation falls in summer (June–August) resulting in floods during the wet phases of climatic cycles. Winter is frosty, windless, with little snow. The maximum thickness of snow cover is less than 30 cm.

In winter, an anticyclone establishes over the Zabaikalsky Krai and Mongolia; it determines sunny, fair weather with insignificant precipitation. The first snow falls in October and evaporates. The stable snow cover is established later, in November–December; in certain years no snow cover is formed at all. Snow disappears in March, (mostly due to evaporation). Northern winds are dominant in spring. Strong and long-lasting, they may cause long-term storms on large lakes. Wind speed is usually high in steppe region. Dominant wind directions are west and north-west during winter and west, south-west during summer. Different types of relief such as mountain ranges, hills and plains also determine the main directions of the wind.

Duration of vegetation period is 120–150 days. Night frosts may occur in the first part of June; whereas the first autumn frosts may already occur in the last part of August. The climate of the region is characterised by long duration of sunshine. The amount of direct solar radiation is higher than 60% of the total solar radiation; the number of cloudy days in certain years can be as little as 9.

The most strongly pronounced climate changes in Daurian region are of cyclic type and influence the hydrological regime of the nominating property (in particular, the water level in lakes), which affects in turn the ecosystems, flora and fauna. V.A. Obyazov (1996) has demonstrated fluctuations of different thermal regimes of the territory and cyclic variations of the annual precipitation, and proved that water levels of the lakes and rivers flow strongly correspond with precipitation variations. 25–35-year-long cycles are of greatest importance for the ecosystems as they create significant habitat transformations.

Soils

Eastern Mongolia with neighbouring territories of Zabaikalsky Krai is distinguished as an independent continental Central-Asian soil-bioclimatic district. In accordance

Fig. 14. Winter in the Daursky Reserve (the northern shore of Zun-Torey lake)

with the agropedological zoning, the nominated property belongs to the Torey flatland district with deeply-freezing chestnut mealy-carbonate soils. Chestnut and mountain-chestnut soils as well as soil containing salt marsh are most widely spread. Upland areas (south-western part, Adon-Chelon at the northern part of the nominated property) with meadow steppes are characterized by mountain black-earth soils. Along the Imalka and the Uldza river floodplains, meadow and marsh-meadow soils are formed. In terms of granulometric composition, stony and poor quality rubbish soils of the abovementioned types are widely spread. West of the Torey Lakes there are sand sediments in the form of active and non-active dunes. Large areas of chestnut soils undergo erosion to a certain extent due to the openness of the area to spring-summer winds and light granulometric composition of soils.

Some areas of insular permafrost are mostly located within the lake hollows. According to the available data, the depth of perennially frozen soil is up to 20 metres, the average range being about 10–15 metres. According to the data of Spec Geology Agency for 1938–1940, permafrost soils were discovered by drilling wells in the Torey Lakes bottom at the depth of up to 17–21 m. The formation of permafrost can occur during the periods of lake drying and lake refilling. In the latter case, the lakes do not completely freeze. Negative temperatures of bottom sediments may be a result of the formation of seasonal cryopeg-mineralized waters with negative temperatures. For example, water temperature of – 16°C was recorded during winter in 1987 in the Nizhnii Mukei lake located to the west of the Barun-Torey lake within the nominated property (Zamana, Ulybina, 1990).

Flora and vegetation

According to the Terrestrial Ecoregions (WWF 200), the nominated property represents main ecosystems of the Daurian ecoregion. It is defined as a transitional ecoregion between the huge boreal coniferous forest biom and the Central Asian dry land biom. It is characterized by a very high diversity and complexity of different ecosystems with very different bio geographical elements as boreal taiga elements, Central Asian steppe and semi desert elements, Daurian endemics and Manchurian-Daurian forest-steppe elements. The Daurian ecoregion is the only one in the world with the complete landscape complex from forest to steppe including lakes, wetlands, river floodplains and mountain parts in almost natural conditions.

In geobotanical terms, according to the zoning by E.M. Lavrenko, the territory under survey refers to the Central Asian (Dauro-Mongolian) sub region of the Eurasian steppe region. Southern part of the nominated property belongs to the Mongolian steppe province (East-Mongolian sub province). This area is genetically integrated with steppe and desert steppe landscapes of Mongolia. In terms of WWF it almost coincides with "Mongolian-Manchurian Steppes" ecoregion. The area to the north of the Torey Lakes including the Adon–Chelon massif, and eastern part of the "Valley of Dzeren" refuge belong to the Khangai–Daurian mountain-forest-steppe province (the Daurian sub province). In terms of WWF this territory is included into "Daurian Forest-Steppe" ecoregion.

Flora of the lower plants has been studied insufficiently. Data regarding moss species as of January 1, 2012 includes information on 19 species and 1 sub variety of bryophytes belonging to 15 families. Three species are included in the Red Data Book of the Zabaikalsky Krai (2010); one of those (*Lindbergia brachyptera*) is included in the Red Data Book of Russia (2005). Unique lichen flora has been insufficiently studied so far. Today over 100 lichen species have been reported within the nominated property and its buffer zone; most of these species do not occur or occur sparsely in the territory of Russia (Makryi, 2005). Seven lichen species are included in the Red Data Book of the Zabaikalsky Krai, and one – *Nephromopsis komarovii* – is included in the Red Data Book of the RSFSR (1988), USSR (1984), and the Russian Federation (2005).

The list of higher vascular plants currently found in the Mongolian part of property consists of 349 species of 58 families. In the Russian part of the property 530 species belonging to 73 families and 244 genera are currently listed, which is approximately 11.5% of the genera and over 55% of the families recorded within the entire Siberian area. The most abundant families are: Compositae (65 species), Gramineae (54 species), Rosaceae (39 species), Fabaceae (38 species), Chenopodiaceae (22 species), and Cyperaceae (22 species). For its taxonomic composition, the flora is similar to the mountain-steppe floras of South Siberia and Mongolia. The halophytic species (in particular, those belonging to the Chenopodiaceae family) add to its uniqueness. This family is among the top ten leading families, which makes the flora similar to that of deserts.

The flora of the nominated property is diverse and characterized by combination of species of different chorological types. The species of the South Siberian and Mongolian (64 species), Eurasian (48 species), Central Asian (43 species), Manchurian–Daurian (42 species) areas are the most abundant ones. East Asian (38) and Circumpolar (35) species are also well-represented. Many flora species of the proposed property are at its territory near their area limits (*Nitraria sibirica, Kalidium foliatum, Tripogon chinensis, Cotoneaster mongolicus, Orostachys fimbriata, Asparagus brachyphyllus, Astragalus miniatus etc.*). Over 30 higher vascular plant species that are subject to protection occur in the reserve. Two of them are included in the Red Data Book of Russia (national level): *Tripogon chinensis* and *Asparagus brachyphyllus*. Five species are listed in the Red book of Mongolia (1997): *Stellaria dichotoma, Sorbaria sorbifolia, Valeriana officinalis, Sophora flavescens* and *Tulipa uniflora*. The rest are included in the Red Book of the Zabaikalsky Krai (regional level). Relicts and endemics of Central Asia prevail among the species with a special conservation status.

Fig. 15. Tripogon chinensis

Fig. 16. Asparagus brachyphyllus

Phytocenotic diversity of the property area includes steppe, meadow, saline, water and shrub types of communities.

Steppe vegetation is represented by two subtypes: typical steppes and meadow steppes.

Typical steppe is the most broad spread community type within the property area. They occupy plains, mild slopes and diluvial tails. The true steppe community is based on several (primarily bunchgrass) species: *Stipa krylovii, Cleistogenes squarrosa, Koeleria cristata, Agropyron cristatum,* less frequently – *Poa botryoides*, a long rhizome grass species *Leymus chinensis* and rhizome sedge *Carex duriuscula*. In different combinations, they form diverse associations: a polydominant small-bunch grass association, *Stipa krylovii-Cleistogenes squarrosa, Stipa krylovii-Leymus chinensis-forbs, Leymus chinensis-Caragana stenophylla-Stipa krylovii, Stipa krylovii-Koeleria cristata, etc.* Communities of hill areas of Mongolian plain are dominated by two species of Stipa *(Stipa krylovii-S.grandis)* which are found at the lower parts of slopes. Forb communities of *Stipa krylovii-Achnatherum sibiricum* are also characteristic. Forbs in typical steppes are represented by a wide range of species: *Pulsatilla turczaninovii, Aconogonon angustifolium, Gypsophila davurica, Galium verum, Haplophyllum dahuricum, Cymbaria daurica, Bupleurum bicaule, B. scorzonerifolium, Artemisia gmelinii, A. frigida, Allium polyrhizum, A. odorum, Oxytropis oxyphylla, Iris potaninii, I. ivanovae.* The shrubs of *Caragana microphylla* and *C. stenophylla* are often found in composition of typical steppe communities.

The meadow steppes are characteristic of the mountain forest-steppe; inside the nominated property they occur in areas of low mountains in relatively moist habitats: mountain slopes, mostly northern, with break stone soils, the lower parts of diluvial tails, and ravines on slopes. The meadow steppes are represented by forbaceous, grass-forbaceous and tansy *(Filifolium sibiricum)* steppes, which are endemic of the Daurian region and steppes dominated with *Leymus chinensis,* which are characteristic of North-Mongolian plains. The most mesophytic variants of meadow steppes are found at the Adon-Chelon massif. One of meadow steppe features is high abundance of mesoxerophytic forbs, such

Fig. 17. Hemerocallis minor

Fig. 18. *Scutellaria baicalensis* and the view of Mt. Kuku-Khodan

as *Hemerocallis minor, Phlomis tuberosa, Sanguisorba officinalis, Thalictrum squarrosum, Aconogonon angustifolium, Galium boreale, Scutellaria baicalensis, Stellera chamaejasme etc.* The typical grass species include *Stipa baicalensis, Cleistogenes squarrosa, C.kitagawae, Festuca sibirica, F. lenensis, F.litvinovii, Leymus chinensis, Koeleria cristata and Poa botryoides*. *Carex pediformis* is always present in the communities of this type and is frequently a co-dominant species. *Pentaphylloides* parvifolia and *Spiraea aquilegifolia* are common shrubs in this type of communities. In more humid areas, the meadow steppes are replaced by dry meadows where many xerophytic species are eliminated.

Another meadow steppe formation typical for the reserve and the refuge is *Leymus chinensis* steppes that are spread widely in the flat part of the area with decreasing relief in lacustrine hollows. The *Leymus* steppes as a rule consist of a small number of species and usually adjoin *Leymus meadows*. *Leymus chinensis* is a species exhibiting broad ecological amplitude, which acts as dominant species both in steppe and meadow communities.

The petrophytic variants of all steppe types are mostly formed by petrophytic forbs and small-bunch grasses; they are notable for particular floristic diversity. The coverage of the petrophytic steppes is always relatively low (less than 20%). No pronounced dominants are usually present (petrophytic forbs steppes). The dominant species may include *Festuca dahurica* (petrophytic forbs–fescue communities), *Chamaerhodes trifida, Arctogeron gramineum* or some other species. The petrophytic forbs steppe includes a variety of species; among those, *Arctogeron gramineum, Saxifraga bronchialis,* Chamaerhodos *trifida, Orostachys spinosa, Silene jenisseensis, Stellaria dichotoma, Stellaria cherleriae, Pedicularis flava, Eremogone capillaris, Ephedra dahurica*; the grass species (*Stipa krylovii, Agropyron cristatum*) are usually less abundant compared to the forbs. The common shrubs include the following species: *Caragana microphylla, C. stenophylla*, and *Spiraea aquilegifolia*. The *Tripogon chinensis* steppes should be classified as rare communities of petrophytic steppes deserving special attention. This steppe type occurs as small patches at tops of the hills fringing the northern part of the Zun-Torey lake and at Adon-Chelon rocky massif. Being confined to the slopes and tops of the hills, ridges and diluvial tails, the petrophytic steppes widely occur within the nominated area. The distinctive feature of the Daurian region is a wide occurrence of stony and breakstone soils; in this connection, hemipetrophytic steppe variants are developed on various relief elements.

Bush-steppe communities with *Ulmus macrocarpa, Spiraea aquilegifolia, S. media, S. pubescens, Armeniaca sibirica* and also *Artemisia gmelinii* communities are derivatives of the broad-leaved forests of past geological periods and typical of contemporary Daurian landscapes. Their grass layer contains both xero- and mesophytes, which alternately prevail in years with different humidity. Such a dual composition is typical of plant communities in Dauria (Dulepova 1993).

Achnatherum splendens and *Achnatherum splendens–Leymus chinensis* steppes stand apart among the steppe vegetation. They belong to the so-called saz steppes that are confined to soils with relatively high salinity and small depth of groundwater occurrence in lake depressions and along foots of hills. The dominant species of these steppes, *Achnatherum splendens,* has a deep root system, which allows it to reach the groundwater. Species that are more or less tolerant to soil salinity (*Leymus chinensis,* Poa *botrioides, Convolvulus ammanii*, etc.) are constantly present within the *Achnatherum splendens* grass stand. The occurrence of the rare species *Limonium aureum* and *Asparagus brachyphyllus* (the latter species is included in the Red Data Book of Russia) in these habitats is of the largest environmental conservation significance.

Saline and meadow-saline soils with characteristic halophytic-meadow and hyper-halophytic communities are formed in dry depressions and around steppe lakes, most of which are saline or slightly brackish.

Among the halophytic meadows, the most common ones are Puccinellia (*Puccinellia tenuiflora, P. macranthera*) meadows, Hordeum (*Hordeum brevisubulatum*) meadows, *Carex* (*Carex reptabunda*) meadows and forbs meadows (*Tournefortia rosmarinifolia, Oxytropis prostrata, Tripolium vulgare, and Iris lactea*). Around the drying Torey lakes, the aforementioned communities occupy significant areas. Forbs meadows are very picturesque during mass flowering time in different periods of the vegetation season. During the period of low water level in the Torey lakes, the Puccinellia and Hordeum meadows play a significant role in vital activity of the vertebrates as shelter and feeding stations of dzerens, hares, as well as bird breeding sites.

Peculiar communities of hyper-halophytic plants (*Artemisia anethifolia, Suaeda corniculata, Kochia densiflora, Kalidium foliatum, Nitraria sibirica, Limonium aureum*) are formed on saline soils that are abundant along the shorelines and on the terraces of the Torey Lakes and smaller lakes. The latter three species are included in the Red Data Book of the Zabaikalsky Krai. *Asparagus brachyphyllus* included in the Red Data Book of Russia sometimes occurs as a component of the halophytic communities. Our surveys have demonstrated that surviving of rare relict species *Nitraria sibirica* strongly depends on hydrological cycles of the lakes. Its population area and number increases by several times during the period of decreasing water level due to the occupation of the exposed shores of big lakes (the Torey Lakes and Huh-Nuur Lake).

In floodplain wetlands of Uldza, Borzya and Imalka rivers meadows with grasses (of the genus *Calamagrostis)* and tussock sedges (*Carex schmidtii* and others) prevail as well as groves of *Salix* spp. *Phragmites australis* communities are also common.

Fig. 19. *Caragana spinosa* in blossom.

Fig. 20. *Achnatherum splendens.*

The reeds (*Phragmites australis, Bolboschoenus planiculmis)* are typical for the shores and shallow water of the Torey Lakes during the abundant periods. The dense reeds are good shelter and food supply for the entire complexes of vertebrate and invertebrate species. The dense reed in the mouth areas of the Uldza and Imalka rivers, notable both for a significant area and a considerable reed height, are of particular significance in this respect. It is these floodplains with reed that provide the high level of biodiversity and population number of geese and ducks species and other waterfowl and semi-aquatic birds during the abundant periods. During these periods, certain sedge and cotton grass species occur at particular regions of the shore of lake Barun-Torey within the helophytic communities. In periods of dry years high reeds remain only in places with constant freshwater springs, for example Galutyn-Nuur Lake in Mongolia, which plays an outstanding role in sustaining of birds biodiversity.

The aquatic flora of the Torey lakes is scarce; however, it has been insufficiently studied. *Potamogeton pectinatus* is the most common macrophytic species of the Torey lakes, which forms dense patches in the shallow water area. *Potamogeton perfoliatus* and *Myriophyllum sp*. have also been observed. The patches of Chara sp. occur at shallow well-heated areas at the phase at which the water level of the lakes starts to decrease; mass development of filamentous algae is observed. A total of 20 macrophytic species belonging to 13 families and 3 divisions have been found in lakes and rivers within the area of the reserve and its buffer zone. Among these findings, the rare species *Potamogeton malanius* found in the Imalka river (the only site where it was previously recorded was the Argun river) and two rare relict mosses *Riccia fluitans* and *Ricciocarp natans* are of interest. Rare species (the Red Book of Zabaikalsky Krai) *Ruppia natans* is found in the Huh-Nuur Lake.

Relict species

A large number of rearrangements associated with climate changes occurred in the history of the flora during the Cainozoic Era; however, no complete extinction occurred. Therefore, the contemporary flora contains a number of ancient species, including the relict ones. The oldest relict species in the contemporary flora are the representatives of the desert–steppe flora of the Cretaceous–Paleogene age: *Kalidium foliatum*, *Nitraria sibirica* and *Ephedra dahurica*. The first two of the aforementioned species belong to the halophytic complex and occur within saline areas, mostly near the Torey Lakes and Huh-Nuur Lake. E.dahurica is confined to stony soils and rocks and is a more abundant species in

Fig. 21. *Stipa krylovii* steppe. Mongol Daguur SPA

Fig. 22. *Nitraria sibirica,* a relict species (the shore of Khukh-Nur lake)

Fig. 23. *Oxytropis prostrate,* a Daurian endemic species (on the leveed banks of Zun-Torey lake)

the area. A number of ancient species under contemporary conditions occur rather widely and play a noticeable role in phytocenosis formation. Thus, *Haplophyllum davuricum* – one of the most widely-distributed species in the Inner Asian region occurring in a number of steppe and desert communities – belongs to the desert–steppe complex of the Cretaceous-Paleogene age.

The relicts of the Miocene–Pliocene semisavannas include *Tripogon chinensis, Stipa klemenzii, Enneapogon borealis, Tulipa uniflora, Iris tenuifolia*.

The origin of another group of relict species is attributed to the Turgai flora, as well as deciduous and coniferous-deciduous forests: the selection of the most xerophytic elements among them was started in the Miocene savannahs and was continued until the Pliocene period. The species belonging to this complex that are present in Dauria include *Ulmus macrocarpa, Spiraea aquilegifolia, Armeniaca sibirica, Eremogone juncea, Filifolium sibiricum, Stellera chamaejasme, Chamaerhodes trifida, Oxytropis grandiflora, O.leptophylla, Lespedeza juncea, L.davurica*. Most of these species are characteristic of the contemporary mountain-steppe phytocenoses.

Endemism

Over 40 endemic and hemiendemic species occur in the Dauria. The Daurian proper endemics are not numerous. *Oxytropis caespitosa, O. prostrata, O.grandiflora, Astragalus miniatus, A.tenuis, Adenophora gmelinii, Thesium longifolium, Cotoneaster mongolicus, and Allium vodopjanovae* are examples of proper Daurian endemics. Much more species of the nominated property flora are endemics of wider territories and can be classified according to their chorological type as: Daurian-Manchurian, Eastern Mongolian, Eastern Siberian, and Southern Siberian endemics. This group of species could be illustrated with such species as *Iris tenuifolia, Ptilotrichum dahuricum, Astragalus scaberrimus, Anoplocaryum compressum, Euphorbia fischeriana*, etc.

Much more the endemism manifests itself on the ecosystem level. Many plant communities include different chorological elements because of ecotone position of the territory between forest-steppe and steppe zones as well as at the area of overlapping adjacent phyto- and zoogeographical units. Climate conditions changing constantly and in high amplitude caused complex ecological composition of plant communities including species with very different ecological niches.

Fauna

According to the zoogeographical zoning, the nominated property belongs to the steppe zone of the Central Asian desert-steppe ecoregion. The fauna of the nominated area includes 14 fish species, 3 amphibian species, 4 reptile species, 327 bird species, 50 mammal species, and over 4000 insect species. The invertebrate fauna has remained insufficiently studied. The insects are the best-studied class of invertebrate animals.

Fish

The species composition of the piscifauna in the nominated territory is scarce. The golden carp (*Carassius auratus*) is actually a monospecies culture of the Torey Lakes. Its number depends on the water level in the reservoirs. Decreasing water level periodically results in mass mortality of the golden carp in winter (winter kill). A decrease in the level by 3–4 m results in death of the golden carp. When water level rises, its number is recovered to the fishing figures over the period of 4–5 years. Meanwhile, the fish capacity of the lakes in the abundantyears is at least 400 tons per year. The second species in population number is Amur Ide (*Leuciscus walecky*). Lake minnow (*Phoxinus percnyrus*), Amur loach (*Misgurnus fossilis*) and lefua (*Lefua costata*) are of very low abundance. The golden carp, as well as smaller fish species, loach and minnow, are important food species for ichthyophagous birds.

The piscifauna of the rivers (Uldz-Gol & Borzya) is considerably more diverse. During the abundant years a large number of fish species typical for the Onon river basin inhabit the Borzya river. The river plays important role as a spawning ground of the European carp (*Cyprinus carpio*), fresh-water catfish, Siberian roach (*Rutilus rutilus*), pike and other species. The Uldz-Gol river is habitat for 7 species of fishes.

Reptiles and amphibians

The Mongolian toad (*Bufo raddei)* is the most abundant amphibian species within the nominated territory. The Siberian wood frog (*Rana amurensis*) also inhabits this area; a rare species, Japanese tree frog (*Hyla japonica*) inhabits the Borzya river floodplain. Pallas' coluber (*Elaphe dione*) and Central Asian Viper (*Agkistrodon halys*) occur on stony uplands to the north and north-east from the Torey Lakes, as well as at the foot of uplands. The Mongolian lacerta subspecies listed in the Red Data Book of Russia (2000) – *Eremias argus barbouri* – is more abundant. 4 species of reptiles Pallas' coluber, Central Asian Viper, Mongolian lacerta and Grass snake (*Natrix natrix*) were recorded in Mongolian part of the nominated territory (Munkhbayar, 2000).

Avifauna

Avifauna of the nominated property is notable for high population of birds and a large number of bird species. A total of 327 species has been recorded here (which is more than 40% of the total number of species in avifauna of the Russian Federation and 75% of the Mongolia). The species include: 149 breeding species (among those, 45 are resident or partially resident), 29 non-breeding species, 31 species occurring during the winter period and on migration (migrating from the northern areas for the winter period), 91 transit migrants, 27 vagrant species and 297 migrating or partially migrating species. The territory provides habitat to 16 globally endangered species (IUCN, categories CR, EN, VU); 13 of those being the regular inhabitants. The nominated property is of international significance for conservation of avifauna of Eastern Asia. Within the territory, the Torey lakes with the adjacent river regions and small steppe lakes are of special significance in terms of ornithology. The Torey Lakes were included in the list of the Important Bird Areas and in the list of wetlands of international importance (the Ramsar Convention).

Fig. 24. *Gloydius halys*

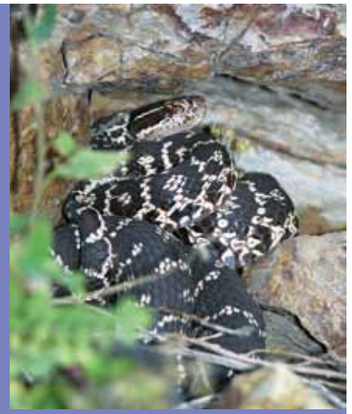


Fig. 25. *Elaphe dione*

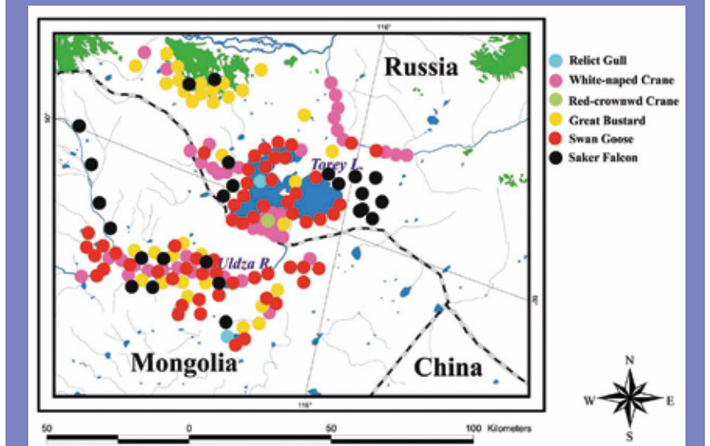


Fig. 26a. Nesting sites of rare birds species

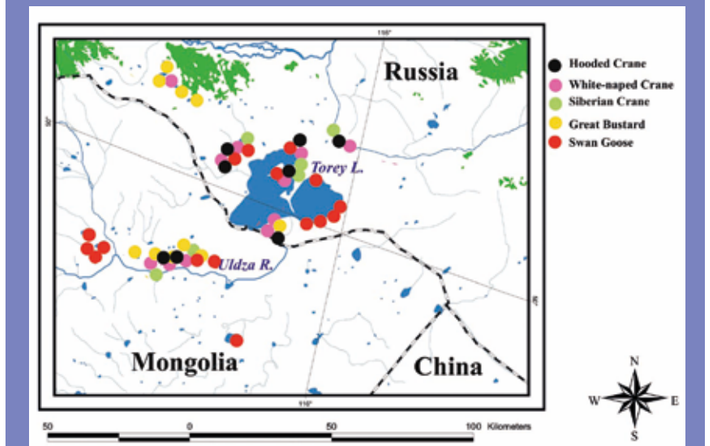


Fig. 266. Gathering sites of rare birds species

During the wet periods, the Torey Lakes and the adjacent regions are the nesting habitats for approximately 100,000 waterfowl and semi-aquatic bird species. In addition, it is an important habitat for breeding of a large number of the globally endangered species (e.g., Swan Goose *Cygnopsis cygnoides*, White-naped Crane *Grus vipio*, Great Bustard *Otis tarda*, Asian Dowitcher *Limnodromus semipalmatus*, and Relict Gull *Larus relictus*). The nominated property has international value for the conservation of five of these species (Table 1). The Torey Lakes are the only site in Russia-Mongolia and one of the four sites in the world, which are known for nesting of the Relict Gull; the major Russian molting and nesting habitat of the Swan Goose (being of international importance); one of the world's key habitats for nesting and gathering of the White-naped Cranes during the autumn period; and the world's key migration stop site of the Hooded Cranes.

During the wet climatic periods, the wide swamped floodplain of the Borzya river plays a significant role for the nesting and migrating waterfowl and semi-aquatic bird species; it serves as a migration corridor and a feeding habitat for approximately 70,000 birds during a migration season and a nesting habitat for about 20,000 birds. Among the globally threatened species, up to 5 pairs of Swan Gooses and White-naped Cranes inhabit this area. During the migration period, it serves as a roosting site for several thousand cranes (White-naped, Hooded, and Siberian Cranes, as well as the Common Cranes and Demoiselle Cranes, which do not belong to the globally endangered species). The Lower of Uldz River has similar or a less role in the dry phase.

Table 1. Significance of the Torey Lakes for conservation of certain globally threatened bird species, (Red List of IUCN, 2011)

Species	Number per plot	
	Number of individuals	% of the world population
Swan Goose (*Cygnopsis cygnoides)*	13400	17
Great Bustard (*Otis tarda dybowski*)	150	13
Relict Gull (*Larus relictus*)	2430	20
Siberian Crane (*Grus leucogeranus*)	32	1
White-naped Crane (*Grus vipio*)	240	4
Hooded Crane (*Grus monacha)*	1250	12

The steppe zones of the nominated property are the site of international importance for nesting of the extinction endangered Eastern Great Bustard *O.t. dybowski*. Up to 150 birds inhabit this area, which makes up to at least 17% of the world number of the subspecies. Its number was estimated in the 1990s to be 1200–1500 individuals (Chan, Goroshko, 1998); today, its number is even lower, since the population has been steadily decreasing. The site also is of importance for breeding of the globally endangered species, the Saker Falcon (*Falco cherrug*) – up to 40 pairs breed here.

In global context, the ornithological significance of the nominated property is determined not only by the unique complex of nesting species, but also by the fact that the Torey Lakes and nearby little lakes are one of the most important in East Asia migratory concentration sites of semi-aquatic and waterfowl birds. In Northeast Asia, an overwhelming majority of waterfowl and semi-aquatic bird species migrate along the East Asian-Australasian flyway. A large intracontinental branch of this flyway passes through the nominated property. Furthermore, the flyway of a large number of bird species is significantly narrowed near the Torey Lakes; therefore, the flow of birds gets more concentrated in that area. This is attributed to the fact that a narrow belt of steppes rich in basins and food turns into the forest-steppe zone with a very small number of lakes and wetlands. In Mongolian and Chinese steppe zone, waterfowl and semi-aquatic birds fly on broad front and are distributed over plentiful lakes. As the steppe belt becomes narrower (the steppes extend into the south-eastern Zabaikalsky region as a narrow wedge), so does the flow of migratory birds. The Torey hollow is located at the northern vertex of this wedge. Due to the large number of lakes and food abundance, the Torey hollow plays an extremely significant role as a resting and feeding site of the migrating semi-aquatic and waterfowl birds (herons, geese, ducks, sandpipers, gulls, terns, cranes, etc.). Thus, almost half of all the Pacific Golden-Plovers migrating

Fig. 27. Relict Gull *(Larus relictus)*

Fig. 28. Swan Goose *(Cygnopsis cygnoides)*

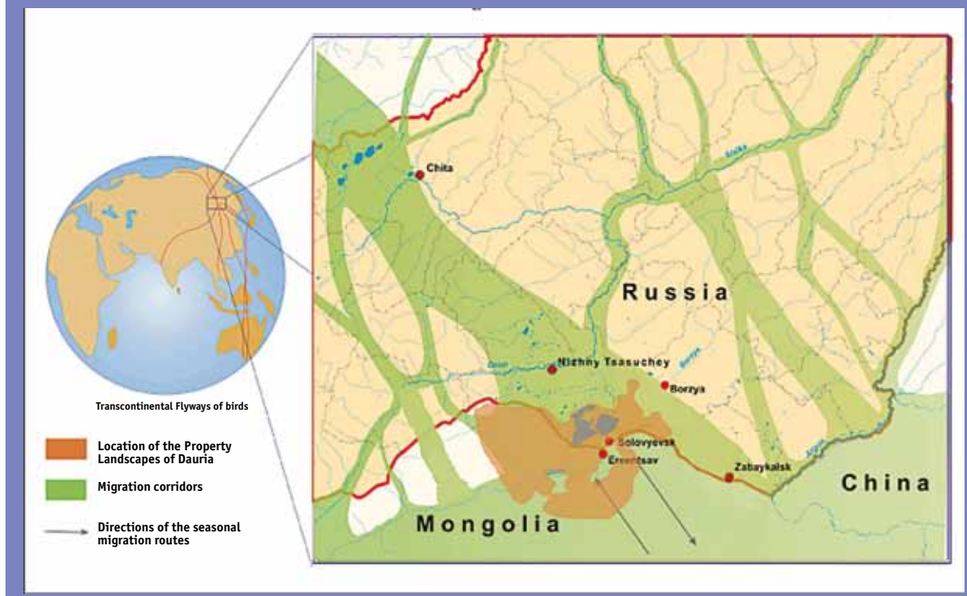


Fig. 29. The main routes of bird`s migration truth South-East Transbaikalia

along the East Asian-Australasian flyway pass the Torey lakes in spring. Along with the waterfowl and semi-aquatic species, predatory and passerine species massively migrate along the site. The inhabitants of the steppe, taiga and tundra zones are also abundant among the migrating species. Preliminary estimates show that the total number of birds migrating through the nominated property is at least 3 million individuals in spring and at least 6 million individuals in autumn.

It is noteworthy that the Daurian steppe ecoregion, which is located in the centre of the East Asian-Australasian flyway, is of particular significance for many vagrant species breeding in the tundra and forest-tundra zones, since they adhere to the habitual open landscapes rich in basins (e.g., many sandpiper species (Calidris sp.), Pacific Golden-Plover Pluvialis fulva, Grey Plover Pluvialis squatarola, Bean Goose Anser fabalis, Bewick's/Tundra Swan Cygnus bewickii/columbianus, a number of duck species). Feeding lakes in the northern part of the steppes near the border with the forest-steppe and taiga (especially the large Torey Lakes) are of particular significance for these species, since it is the important starting place for the birds before they start a long flight over the Siberian taiga zone, which is vast but badly suited for feeding in spring. Moreover, it is the first suitable resting and feeding place after the same flight in autumn (during the migration over the taiga zone, the tundra bird species almost do not feed and try to avoid resting). Therefore, a lot of bird species live and feed on the Torey Lakes for a long period of time (e.g., the Bean Goose – up to 30–50 days).

In the northern part of the Daurian steppe ecoregion, the Dalainor lake that is located to the southeast on the territory of China is also of significance for migratory and nesting waterfowl and semi-aquatic bird species. In general, this lake supports approximately the same number of birds; however, the Torey Lakes are of an incomparably larger significance for the conservation of the globally endangered species (in particular, cranes, Relict Gull, Great Bustard, and the Saker Falcon). The global significance and uniqueness of the Torey lakes for the migratory and nesting birds is determined to a large extent by their successful geographical location, food abundance, high diversity of biotopes, large

Fig. 30

Fig. 31

Fig. 30. Adult birds and a chick of the Pied Avocet
Fig. 31. During the spring passage at the Torey lakes
Fig. 32. Autumn aggregation of cranes in the Daursky reserve
Fig. 33. Great Bustard (Otis tarda)

Fig. 32

number of islands, continuous deep cyclic fluctuations of the water level and the strict protection regime. In Northeast Asia, within the East Asian-Australasian flyway, the lakes Khanka, Baikal and Ubsu-Nur are of a comparable significance for birds. These lakes are located at a considerable distance from the Torey Lakes, in different natural zones and have fundamentally different hydrological and biotopic characteristics; therefore, they mostly support the habitats of other bird species.

The nominated property is of particular significance for conservation of cranes; in this context, it is one of the most unique areas of our planet. Out of 15 crane species that are known in the world, 6 species were observed at the site (Red-crowned Crane Grus japonensis, Siberian Crane Grus leucogeranus, Common Crane Grus grus, White-naped Crane Grus vipio, Hooded Crane Grus monacha, and Demoiselle Crane Anthropoides virgo); among those were four species inscribed on the endangered species list (IUCN). Five out of six species are the regular inhabitants. The gatherings of migrating birds at the Torey Lakes and their neighbourhood have no analogues in the world – they count over 40 thousand cranes belonging to five species; four of these crane species being extremely large. The Demoiselle Crane (in certain years, the number of this species reached 42,000; it was approximately 17% of the total number of birds of this species in the world) is dominant within the gathering. There are similar migration gatherings of cranes (and comprising even more birds); however, all of them can be classified as mono-species gatherings (e.g., the Sandhill Crane in North America). The gatherings that are similar in terms of species diversity (up to 4–5 crane species) occur in north-eastern Mongolia and in the Middle Amur basin; however, the total number of birds in these agglomerations is much smaller.

The special role of the Torey Lakes and the Torey hollow as a significant summer habitat site of a large number of non-nesting birds (in particular, waterfowl and semi-aquatic species; many of them spend the molting time here) is also worth mentioning. The waterfowl and certain semi-aquatic bird species lose their flying ability during the molting period; therefore, it is a critical and particularly vulnerable period of their lifecycle (as well as nesting and migration). The Torey Lakes are the key molting site of Swan Geese (up to 2300 birds molt here) and approximately a thousand ducks (Ruddy Shelduck Tadorna ferruginea, Common Shelduck Tadorna tadorna, Common Goldeneye Bucephala clangula, Common Pochard Aythya ferina, etc.; the total number being up to 10,000 birds). Non-breeding Swan Geese gather for molting on the Torey Lakes, as well as a number of other lakes of the Daurian ecoregion, from the vast area of the Northeast Asia (Dauria is the key molting site of the species). The Torey Lakes and the adjacent regions of the hollow are the key habitat of non-breeding, immature Siberian Cranes (up to 32 individuals) and Hooded Cranes (up to 300 individuals).

Table 2. Significance of the Torey lakes for conservation of certain migratory bird species

Species	Number of birds (individuals)	% of the birds migrating along the East Asian–Australasian flyway
Bewick's/Tundra Swan (Cygnus bewickii/columbianus)	10000	11
Ruddy Shelduck (*Tadorna ferruginea*)	11000	10–20
Common Pochard (*Aythya ferina*)	31000	10
Pacific Golden-Plover (*Pluvialis fulva*)	40000	40
Wood Sandpiper (*Tringa glareola*)	35000	35
Kentish Plover (*Charadrius alexandrinus*)	18000	18
Red-necked Stint (*Calidris ruficollis*)	90000	30
Broad-billed Sandpiper (*Limicola falcinellus*)	5000	8
Little Curlew (*Numenius minutus*)	20000	11

The steppe and especially the hills with ravines covered by shrubs and small woods, ridges and spurs on the edges of the Torey basin are of additional great value in maintaining high diversity of various species and abundance of birds of the nominated territory. The most important are Khuh-Ula mountain, ridge of hills to the north of the Zun-Torey lake, southern spurs of the Nerchinsk mountain range, hills near the right bank of Uldz-Gol river as well as the mountain range the Adon-Čhelon, enriched by rocky formations. Many species of birds, including those which usually inhabit forests use these habitats for nesting. Millions of passerine stop here for rest during migration.

Mammal fauna

Almost all mammal species historically developed in this area are well preserved in the nominated territory, all trophic levels including large herbivores and predators are represented. There are good opportunities to restore the popu-

Fig. 34. The Torey Lakes in the morning

Fig. 35. Mongolian Gazelle, an endemic species of the Daurian steppe

Fig. 36. A newborn Mongolian Gazelle in the Daursky reserve

lation of Altai mountain ram which was dramatically reduced two centuries ago.

In the fauna context, the nominated property belongs to the steppe zoogeographical subregion of the Paleoarctic region and lies within the Mongolian-Daurian intermutation focus (Kucheruk, 1959). Six endemic and subendemic species with the Mongolian-Daurian type habitats occur in this region: the Daurian souslik (*Spermophilus dauricus*), Brandt's vole (*Lasiopodomys brandti*), Daurian hedgehog (*Mesechinus dauuricus*), Daurian zokor (*Myospalax aspalax*), Zabaikalsky hamster (*Cricetulus pseudogriseus*) and Mongolian gazelle or dzeren (*Procapra gutturosa*). A total of 18 steppe mammal species inhabit the region. The habitats of the most of other species are more extensive, including the Holarctic (as is the Grey wolf and Red fox), Transpaleoarctic, East-paleoarctic other types. The Racoon dog (*Nyctereutes procyonoides*) penetrated into the Torey lakes in the 1950s from the east. The Musk beaver (*Ondatra zibethicus*) is the only introduced species.

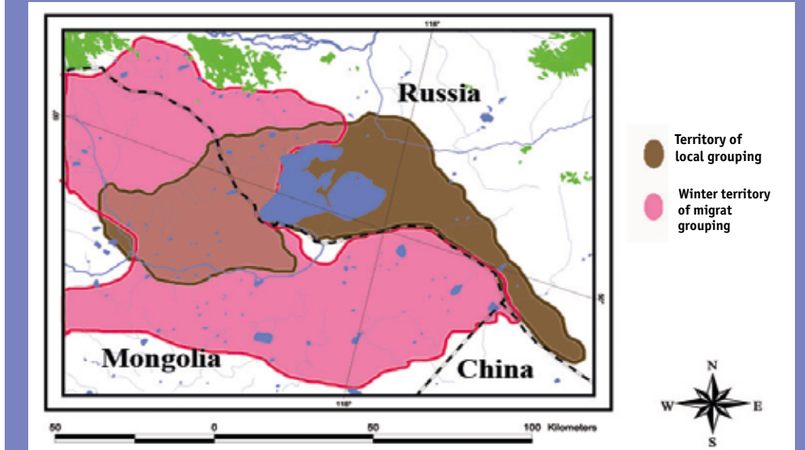


Fig. 37. Dzeren distribution area in the Zabaikalsky Krai and Eastern Mongolia

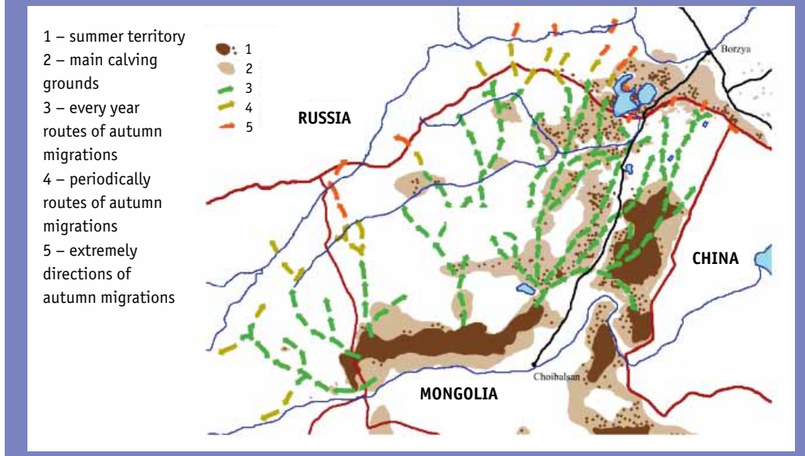


Fig. 38. Summer territory and main migrating routes of the North-Kherlen population of Dzeren (*Mongolian gazelle*)

The orders Rodentia (19 species) and Carnivora (13 species) are the most representative. The dominant species are: in steppe communities – the Daurian pike (*Ochotona daurica*), Zabaikalsky hamster, Campbell's dwarf hamster (*Phodopus campbelli*), Brandt's vole, Narrow-skulled vole (*Microtus gregalis*), Tolai hare (*Lepus tolai*); in forest communities – Siberian roe deer (*Capreolus pygargus*); in floodplain communities – the Reed vole (*Microtus fortis*). The most abundant species in order Carnivora are wolf, fox, badger; over certain periods, Corsac fox (*Vulpes corsac*) and Raccoon dog. The population of Pallas cats (*Otocolobus manul*) in the nominated area has increased at the beginning of the 21st century due to the measures taken in the Daursky Reserve. According to the records of 2010–11, density of the population of these species in the Torey Lakes interfluve was 4 animals per km^2.

The nominated property is a hábitat for dzeren, or Mongolian gazelle (*Procapra gutturosa*) – the last of the Asian ungulate species that still make long-distance migration. Two relatively large local groups of Mongolian gazelle have been formed after 2001 in the Torey lake area; the total number of gazelles here has reached 5–6 thousands by 2012. As well, from 30–50 to 120 thousands dzerens (3–8% of world population) form a large migrating winter population within the nominated property every year. The nominated territory provides the last free passage for cross-border migrations of dzeren between Mongolia and Russia, there is an extensive suitable area for its distribution on the Russian territory.

The optimal conditions for existence of certain mammal species are created in different phases of the climatic cycles. Wet periods result in an increase in number and expansion of the habitat of roe deer, reed vole, Daurian zokor, Tarbagan marmot, badger, raccoon dog and shrews. Dry periods are favourable for the Mongolian gerbil and Brandt's vole and result in an increase in the migration distance of dzeren and disappearance of the raccoon dog.

Fig. 39. The Daurian Pika (*Ochotona daurica*)

Fig. 40. Tarbagan (Mongolian Marmot) (*Marmota sibirica*)

Fig. 41. The Daurian Hedgehog (*Mesechinus dauuricus*)

2b. History and development

History of geological development

The Torey Lakes, the largest lakes in the steppe zone of Zabaikalsky Krai are the remnants of a great ancient lake that covered the whole territory of the Torey-Borzya watershed, being as large as 2400 km^2 (Shamsutdinov, 1971). The facts that diatomaceous algae were found in sands of the Torey hollow at 50 m altitude above the water level of the contemporary lakes and that jasper and chalcedony minerals are commonly found near the Torey Lakes (being an indicator of submarine volcanism on the bottom of the lacustrine basin) support the concept that the ancient sea existed there. The lake size gradually decreased with time. In the beginning of the Middle Quaternary Period, the left bank of the Onon river slightly rose, the northward flow of water stopped, resulting in the emergence of the Torey Lakes. Being closed now, the lakes used to feed the Borzya river (which is now a tributary of the Onon river) in the Quaternary Period.

History of economic development

RUSSIAN FEDERATION

Prior to the establishment of the nature reserve, the Torey Lakes and the entire wetland complex were not subjected to any significant anthropogenic impacts. Hunting and fishing were the only anthropogenic activities here; however, the habitats remained intact and the territory was not contaminated. The steppe zones were exploited to a more significant extent. Approximately 20% of the steppes were previously ploughed up; the remaining territory was used as pastures and hayfields. No significant disturbance of the grass stand took place at pastures and hayfields; the steppes recovered after 3–4 years. The fallow lands return to their primeval form after 30–40 years [Chimbueva, Tkachuk], depending on their size, the current natural moistening cycle and grazing intensity at that territory.

MONGOLIA

Mongol Daguur (Daurian) region was sparsely populated until the 1940s. The economy engaged by local residents was traditional animal husbandry and it was free of any other economic activities and outside disturbances. However, a railway between Choibalsan in Mongolia and Borzya town in Russia was built in 1939 and Ereentsav border custom point and Chuluunkhoroot Soum were established and settled by humans. A state farm Ereentsav was set up based on Chuluunkhoroot Soum and it provided a basis for use of its vicinity for farming and cultivation. In the 1980s, it was one of the important state farms in the country as it had 20,000 ha rotational cultivation land (A map on Ereentsav farmland). However, during the transition to the democracy and market economy in the country, the state farm was closed down and farming or cultivation was no longer taken place in Chuluunkhoroot territory. At present, the abandoned farmland is being restored to its natural state.

Some game species e.g. Siberian/Mongolian marmot, roe deer, Mongolian gazelle, red fox, and grey wolf are hunted by local residents in small numbers for subsistence or household purpose. No commercial hunting of the wild species is taking place in the region. The Mongolians have no tradition to hunt birds, so birds are not hunted at all. However, there were some reports on bird hunting by specialists and officers from the Soviet Union, who worked at Mardai uranium deposit in the 1980s. They came to Ulz River valley and Lakes Galuut, Duruu and Khukh in spring and autumn to hunt water birds. According to previous research papers, water birds were largely hunted in Torey Lake and lower part of Ulz River in Russia at the beginning of the 19th century.

Recent conservation history

Practical protection of natural complexes of the Torey hollow began with the establishment of the Tzasucheisky state refuge of the regional level on the Russian territory in 1964. Later (in 1982) Tzasuchei-Torey refuge of the republic level was created on its base, it took under its protection Tzasuchei pine forest and the Barun-Torey lake with the adjacent area (according to the Resolution of the Hunting authorized body of the RSFSR dated 07.06.1982). The total area of the refuge was 99.3 thousand ha including lake cluster of 41.4 thousand ha. Creation of the lake cluster refuge was seen as the first step in creating the reserve, the design of which was prepared in 1985–1986.

Resolution of the RSFSR Council of Ministers No. 514 on the establishment of the Daursky nature reserve with total area of 44,752 ha was issued on December 25, 1987. The reserve comprised 6 cluster areas: the Barun-Torey lake and the surrounding steppe territory, 3 sites on the northern shore of the Zun-Torey lake and forest-steppe area on the southern edge of the Tzasuchei pine forest. In 1992 the reserve acquired another three small plots in the tract of Adon-Chelon with the total area of 1038 ha.

The reserved areas are surrounded by a buffer zone which is a territory with limited environmental management regime. The rules and regulation are defined by the provision on the buffer zone of the STATE NATURE BIOSPHERE RESERVE “Daursky”, approved by the Decree of the head of administration of Chita region dated 24.08.2004, no. 160 – a/p, and are designed to ensure more effective conservation and restoration of natural complexes in the reserve.

Moreover, the protected zone serves as a buffer, limiting negative anthropogenic impact on the protected territory, unites and increases the environmental value of isolated small areas of reserve and, more importantly, is significant in its own right as the key habitat of several rare species of animals and birds. Protective zone has an area of 173.320 ha.

In September 1994, the RF Government Resolution No. 1050 included the Torey Lakes, including the territory of the reserve “Daursky” and the part of the reserve’s buffer zone on the list of wetlands of international importance, especially as a waterfowl habitat (Ramsar Convention). In March 1997, the International Wetland included the nature reserve in the Network of North-East Asia crane reserves and in October 1997 the reserve was included in the international network of biosphere reserves under UNESCO program “Man and Biosphere”.

Mongol Daguur Strictly Protected Area (SPA) was established by the State Small Khural Resolution No: 11 in 1992 to protect and preserve the Daurian steppe and wetlands and their wildlife (fauna and flora) species. In 1995, the protection status of Mongol Daguur SPA was reconfirmed with the same category by the State Great Khural Resolution No: 26. In 1997, Mongol Daguur SPA along with the lakes in its vicinity was listed in Appendix to the Ramsar Convention. In 1998, the SPA was included in the international network of North East Asian Crane conservation and in 2006; it was included in the World Man and Biosphere network.

A new stage in the development of both reserves is linked to the establishment of the first and so far the only one in Asia three-party international Russian-Mongolian-Chinese reserve. In March 29, 1994 an agreement was signed in Ulan Bator to establish “a joint reserve in areas near the Russian-Mongolian-Chinese border”.

The official name of the reserve is CHINA-MONGOLIA-RUSSIAN “DAURIA” INTERNATIONAL PROTECTED AREA (CMR DIPA). In addition to the abovementioned reserves, the international reserve included the Chinese biosphere reserve “Dalainor”. One of the key points of the agreement was the commitment of the parties to provide for “unrestricted movement of wild animals from one part of the nature reserve to another”, i.e. to preserve traditional migration routes of vertebrates within international protected area.

The supreme governing body of the international reserve is the Joint Commission. The key issue for discussion at its 4-5 meetings was the need to establish transboundary Ramsar refuge, a biosphere reserve and a world heritage site on the basis of the international reserve. The Chinese party stated at the last (5th) meeting of the Joint Commission (August 2010, city of Choibalsan) that it is not interested in obtaining the status of the world heritage site for the Chinese part of the reserve.

In November 2011, on the initiative of the Daursky reserve a refuge of federal significance “Dzeren Valley” was formed in order to preserve key habitats of the Mongolian dzeren and valuable areas of steppe and wetlands, The total area of the refuge is 213,838 ha (Resolution of the Government of the Russian Federation No. 2116-p, dated November 24, 2011). In the east and north the refuge is directly adjacent to the buffer zone of the reserve or overrides it (the area of overlap is around 35 thousand ha). The refuge (zakaznik) was created without the change of ownership and it is in operational management of the reserve.

Therefore, the Daurian steppe is included in the list of 200 ecoregions announced by the WWF.

At the Utochi channel

3. Justification for inscription

3.1.a Brief synthesis

The Mongolian-Russian transnational property "Landscapes of Dauria" includes the Mongolian Daurian (Mongol Daguur) Strictly Protected Area with part of its buffer zone on the territory of Mongolia, Daursky State Nature Biosphere Reserve with its buffer zone and part of the Federal Nature Refuge "The Valley of Dzeren" in the territory of Russia.

The nominated property occupies the northern part of the Daurian steppe ecoregion that was acknowledged to be one of the most significant sites for conservation of the planet's biodiversity within the Global 200 list, is located on the border between its two components: the Mongolian-Manchurian steppe and the Daurian forest-steppe. A virtually complete historical set of plants and animals which are typical of the Daurian grassland, forest-steppes and intrazonal wetlands is represented at the nominated property.

The landscapes of the proposed territory contain the key aspects of evolutionary processes of the ecosystems and biological diversity they contain. The ecosystems and the natural communities within the property are adapted to continuous deep changes caused by periodic climate change and adjust accordingly. Periodic transformation of wet biotypes into dry and vice versa provides optimal conditions for existence of a number of species with different ecological requirements within the same territory. The nominated property is of an undoubted scientific significance as an example of adaptation of the species and ecosystems to the continuously changing climatic conditions and is an important object for monitoring these processes.

The East Asian-Australasian flyway of waterfowl, semi-aquatic and passerine birds becomes narrower in the nominated property; therefore, it is the key resting site for these birds. The Torey lakes with mouths of the Imalka and Uldz rivers, as well as a part of the Uldz river floodplain are inscribed on the list of wetlands of international importance and the important birds areas. Up to 3 million migrating birds stop here. Among the avian species observed at the site, more than half are vagrant birds. A total of 16 globally endangered species inscribed on the IUCN Red List (2011) have been observed in this territory and almost 40 species have been inscribed on the Red Data Books of the Russian Federation and Mongolia. The site is of special significance for conservation of the crane species. Six crane species inhabit this territory; up to 20% of the total world population of the Demoiselle Crane, up to 12% of the world population of the Hooded Crane, 5% of the White-naped Crane and up to 1% of the Siberian Crane accumulate in the Torey hollow before the autumn migration. The Torey lakes are one of the four known world breeding sites of the Relict Gull (over 20% of the world population); the lake hollow and the adjacent regions are the habitats of approximately 13% of the total world population of the Eastern Great Bustard.

It is one of the last Paleoarctic regions still inhabited by numerous herds of wild ungulates – dzerens (Mongolian gazelles). The territory is of key importance for conservation of natural massive transboundary migration routes of dzeren, which is the last grandiose phenomenon of this type in Central Asia. The total number of migrating dzerens staying at this region every winter is as high as 100,000 individuals (5–8% of the total number of the species); the number of non-migrating dzerens is 7–8 thousand individuals.

The species structure diversity and abundance of birds and mammals, as well as the number of rare species is attributed to a number of factors: biotope diversity (the entire range of landscapes and biotopes which are typical of the Daurian ecoregion are located here), specific location of the area situated at a narrow point of birds migration flyways, positioning at the junction of large biogeographical units and variability of ecosystems caused by climate cyclicity.

Fig. 42. Dzeren (*Mongolian Gazelle*)

3.1.b Criteria under which inscription is proposed (and justification for inscription under these criteria)

The Daurian Steppes natural site is nominated for World Heritage status under the following criteria:

ix) be an outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals

The duration of the most significant interdecadal cycles of wetting varies from 25 to 35 years. During dry periods most lakes dry up to be filled with water again during wet years. The cyclic variations of humidity of the territory result in changes in the ecosystems, which is characterized by periodic transformations of the entire natural site, including soils, shoreline of the lakes, landscape, salinity, sedimentation and changes in the qualitative and quantitative structure of vegetation and fauna. It is the occurrence of the climatic cycles that facilitates the presence of high biological diversity of the area, since conditions for habitation of the species with different ecological requirements are periodically created. Meanwhile, a number of species have developed ecological adaptation that allows them to suc-

cessfully inhabit this territory during various phases of the climatic cycles.

(x) contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation

The territory is of universal significance for conservation of several tens of bird species migrating along the East Asian-Australasian Migration Flyway including 16 IUCN globally endangered species (categories CR, EN, VU). 13 of those species are the regular inhabitants. The number of the following species comprises a significant share of the total world population: Swan Goose – 17%, Great Bustard – 13%, Relict Gull – 20%, Siberian Crane – 1%, White-naped Crane – 4%, and Hooded Crane – 12%. One of the four known breeding sites of the Relict Gull is located at the Torey lakes.

The total number of only waterbirds and shorebirds migrating through the nominated property is up to 3 million in spring and more than 6 million in autumn; the number of birds of certain species also comprises a significant share of all the birds of this species migrating along the East Asian-Australasian Migration Flyway: Bewick's/Tundra Swan – up to 11%, Pacific Golden-Plover – up to 40%, Wood Sandpiper – up to 35%, etc. One of the world largest pre-migratory gatherings of cranes, characterized by unique diversity of species, is also located here.

The territory is of key importance for conservation of natural massive transboundary migration routes of dzeren, which is the last grandiose phenomenon of this type in Central Asia.

3.1.c Statement of Integrity

Integrity concept has already been evaluated when Specially Protected Areas (State Reserve, Federal Nature Refuge and Strictly Protected Area) were founded. The nominated property contains major elements inseparably interconnected by homogeneity and dynamics of natural development and possesses characteristics necessary for justification of its Outstanding Universal Value.

The total number of migrating dzerens staying annually at the property during winter time is as high as 100 000 individuals (about 8% of the total number of this species). Up to 3 million migrating birds stop here and a total of 16 globally endangered bird species inscribed on the IUCN Red Data Book have been observed in the property.

The size of the nominated property (859 102 ha) fully represent features and processes, emphasizing their significance. Buffer zones around the Property (310 719 ha) give additional guarantees of integrity.

Different human activities (cattle grazing, grass cutting and others) that had been existing here before foundation of the specially protected areas, caused limited effect on ecosystems and did not result in serious damage. Biophysical processes and natural landscapes' elements of the nominated property have been preserved.

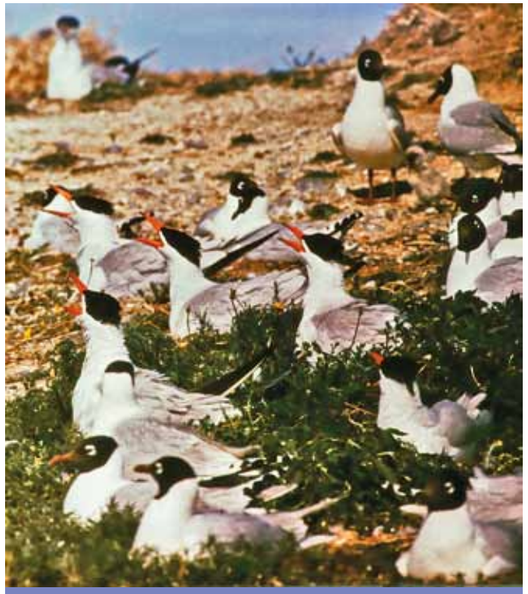


Fig. 43. Caspian Tern and Relict Gull

Fig. 44. A Golden Eagle chick

Fig. 45. The Adon-Chelon rock massif

Fig. 46. A flock of Mongolian Larks

3.1.e Protection and management requirements

Nowadays the status of the State Reserve and Strictly Protected Area (which meets the requirements of the Ia IUCN category) and the status of Federal Nature Refuge (IV IUCN) ensure the conservation and further natural development of the unique ecosystem complex. Any economical or business activities are prohibited on the territory of the SPAs and restricted within their buffer zones. Such activities as hunting, application of chemicals, mining operations, commercial building and transport routes construction are prohibited. Thus, territorial and functional integrity is achieved within such a vast territory of the natural complexes.

Existing since 1994, China-Mongolia-Russian "DAURIA" International Protected Area (CMRDIPA), which includes the nominated territory, provides additional guarantees of its safety.

The special protected areas within the nominated territory possess enough financial and administrative resources for long-term conservation of the property`s Outstanding Universal Value. Integrated coordination system of transboundary property management is being developed at the moment.

For additional information see Section 5.

3.2 Comparative Analysis

The comparison of the nominated property with other natural sites that have already been inscribed on the UNESCO World Heritage list (and those recommended to the inscribed) attests to the existence of a number of unique characteristics. This fact allows one to claim the universal level of importance of "Landscapes of Dauria" in the light of two criteria provided in the UNESCO Convention, namely: criterion ix – "be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial and fresh water ecosystems"; criterion x – "contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation". Each of the aforementioned criteria is revealed in relation to the Daurian site in two different aspects.

Criterion ix: A) The presence of the phenomenon of the international value level - vast areas of pristine Central Asian steppes with their characteristic natural dynamics and vivid manifestation of a variety of seasonal and perennial cyclic processes) The presence of wetlands of international importance (Torey Lakes), which preserve their natural cyclic development and play the key role in the process of migration along the East Palearctic region (the East Asian-Australasian flyway of waterfowl) for several types of bird species).

Criterion x: A) rich waterfowl and semi-aquatic avifauna, including a wide range of globally rare species (IUCN, categories CR, EN, VU); B) The presence of globally rare species of mammals listed in the International Red Book: dzeren, manul and some other species inhabiting the steppes. *

CRITERION IX

A) DAURIAN STEPPES AND OTHER STEPPE REGIONS IN THE WORLD

It was shown by studying the sites that have already been inscribed on the World Heritage List (J. Thorsell, 2003, and other sources) that whereas a number of the world's biomes (wetlands, wet and dry tropical forests, shorelines and mountains) are well-represented in the List, certain biomes have been represented to the minimal and completely insufficient extent. Temperate grasslands are among the latter category.

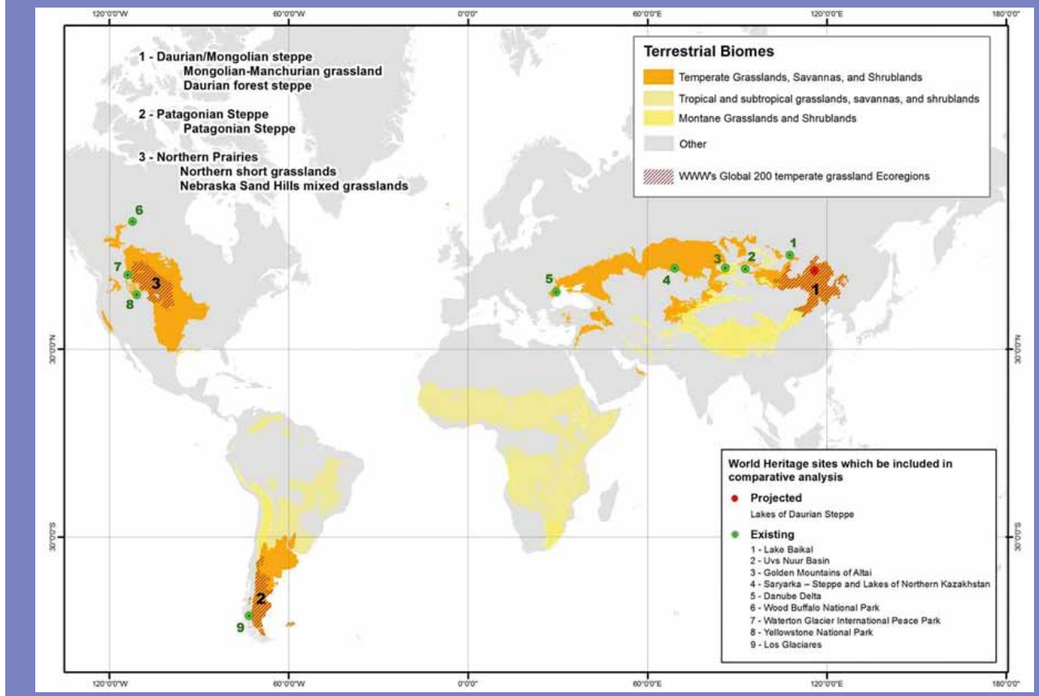
It is a well-known fact that the steppe biome is the most abundant on three continents: in Eurasia (steppes), North America (prairies) and South America (the pampa). Significant areas are occupied by steppes in the world; however, the area of lands covered with pristine, virgin (or at least efficiently recovered) steppes is increasingly reduced. The more topical is the task of organizing new steppe protected areas and inscribing the most significant of those on the UNESCO World Heritage List is.

It is clear from Fig. 46 that certain World Natural Heritage sites are confined to the steppe regions. Meanwhile, the number of these WH sites in the world is extremely small (no more than 10 sites). Furthermore, most of them either are located at the boundary of steppe areas or include the regions of mountain (instead of zonal) steppe or these regions have been to a certain extent developed and anthropogenically disturbed. Therefore, only few WH sites can be regarded as true steppe ones.

It should be borne in mind that grasslands, prairies, and pampas differ to a significant extent in their climatic and soil conditions, vegetation, fauna, and other parameters (the difference in structure of grassland vegetation being most noteworthy). Table 3 illustratively demonstrates these differences, which attests to the fact that no explicit analogues of the Daurian steppes can be found among the steppe sites in the World Heritage List located in North and South America. It is obvious that the search for possible analogues should be performed within the Eurasian steppe belt, in particular, on the territories that are geographically close to Dauria. Therefore, such grassland WH sites of the New World as the Waterton Lakes/Glacier National Parks (Canada–USA), Wood Buffalo National Park (Canada), Yellowstone National Park (USA), and Los Glaciares National Park (Argentina) are eliminated from the scope of subsequent analysis.

** Daurian steppe ecoregion is a common name for two adjacent sub regions – the Daurian forest-steppe in the north and the Mongolian-Manchurian steppe at the centre and south. The Russian-Mongolian serial transnational site "Landscapes of Dauria" is located directly on the border between this two components, having the features of both of them.*

Fig. 47. Location of the WH sites that comprise temperate grassland areas, according to the Udvardy classification and WWF Ecoregions*



* only temperate grasslands from the list of WWF priority ecoregions are shown on the schematic map

Proceeding to a more thorough consideration of the temperate belt of Eurasia, the grassland vegetation here is known as a giant belt, over 8 thousand km long (N 27–127° and E 55–46°), which stretches from the lower reach of the Danube river on the west to the Northeast China (Manchurian) Plain on the east. The diversity of the Eurasian steppes is quite large; each type is unique and different from the other.

The following World Natural Heritage sites comprising steppe ecosystems to a certain extent are located here: "Danube Delta" (Romania), "Saryarka – Steppe and Lakes of Northern Kazakhstan" (Kazakhstan), "Golden Mountains of Altai" (Russia), "Uvs Nuur Basin" and "Lake Baikal" (Russia). However, as can be seen in Fig. 47, these sites are distributed quite non-uniformly within the steppe belt of Northern Eurasia.

According to the scheme proposed by E.M. Lavrenko, the Eurasian grassland region is subdivided into the Black-Sea–Kazakhstan and Central Asian (Daurian–Mongolian) subregions. This subdivision is based on climatic, floristic and phenotypic differences. The grasslands in the Black-Sea–Kazakhstan subregion are mostly located on the plain with strongly pronounced latitudinal zoning; whereas the Central Asian grasslands occupy the territory with hummocky relief and high mountain massifs being the predominant relief types. This subregion is characterized by the absence of a single latitude climate gradient. The types of steppe vegetation in this subregion are determined by the character of the underlying rock, detritus content in soil, exposition and altitude of the site and various combinations of temperature and moisture.

The Black-Sea-Kazakhstan steppe is presented by two WH objects – "Danube Delta" and "Saryarka"; whereas the Central Asian steppes are not embraced by the WH sites.

Table. 3. Comparison of the natural characteristics of the steppes of Eurasia, North and South America*

	Climate	Amount of precipitation, mm/yr	The dominant vegetation types
Eurasian steppes	Moderately continental, sharply continental	North-south: 430–150 mm West-east: 412–215 mm.	– meadow steppes (*Phleum phleoides, Poa stepposa, Helictotrichon schellianum, Calamagrostis epigeios, S. pennata, Carex humilis*) – true steppes (*Stipa zalesskii, S. tirsa, S. pulcherrhima, Stipa lessingiana, S. krylovii, Helictotrichon desertorum, Festuca valesiaca, Koeleria cristata, Agropyron pectinatum*) – deserted steppes (*Stipa sareptana, S. glareosa, S. caucasica, S. gobica, Cleistogenes squarrosa*)
Prairies	Northern part – moderate cold climate Southern part – moderate warm climate and Subtropical	Up to 600 mm in eastern and south-eastern regions; less than 300 mm in the western regions. In the sub-montane regions of the Rocky Mountains, in their rain shadow, and in shortgrass prairies – 250–500 mm per year.	– tallgrass prairie (*Andropogon gerardii, Schizachyrium scoparium, Sorghastrum nutans, Panicum virgatum, Stipa comata, Pascopyrum smithi*). – mixed prairie (*Andropogon saccharoides, Bouteloua gracilis, Sporobolus cryptandrus, Bouteloua dactyloides, Chloris cucullata, Bouteloua hirsuta, Bouteloua aristoides, Gutierrezia dracunculoides, Croton texensis*) – shortgrass prairie (*Bouteloua gracilis, Bouteloua dactyloides*)
Pampa	Subtropical continental climate	In the eastern regions, 800–1000 mm, in the north-eastern regions – up to 500 mm per year. In the sub-montane regions of the Andes – up to 300–500 mm	– tallgrass pampa (*Poa ligularis, Stipa tenuissima, Stipa tricotoma, Stipa filiculmis, Panicum urvilleanum, Elionurus muticus, Sorghastrum pellitum, Eragrostis lugens, Bromus brevis, Chloris retusa, Discaria longispina, Baccharis articulata, Geoffroea decorticans, Prosopis caldenia*) – shortgrass pampa (genera *Stipa, Piptochaetium, Aristida, Melica, Briza, Bromus, Eragrostis, Poa*)

* In this table, the steppe variants that are typical of the latitude zonality (north–south) are given for Eurasia and North America; the longitude row is given for South America (Argentina). The zonal rows are special types of mountain-related steppes and/or steppes existing in the extrazonal positions outside the steppe zone.

This gap could be eliminated by the proposed property – "Landscapes of Dauria," which is located within the Daurian steppe ecoregion and is highly specific for a number of key parameters (flora composition, dominant steppe types, climatic features, relief pattern, fauna, etc.). Indeed, Daurian-type steppes are a true natural phenomenon that is not repeated even in the adjacent regions. These steppes cannot be identified with western-type steppes (the "Danube Delta" site), either with Kazakhstan steppes (Saryarka) or with mountain steppes of southern East Siberia (Altai, Ubsunur, Baikal sites).

Indeed, it becomes clear from the table (column 3) that only three sites out of the compared sites are completely located in the Temperate Grasslands biome, namely, Dauria, Saryarka, and the Danube Delta. Montane grasslands and shrublands are represented in two sites: the Ubsunur hollow and the Altai. As for the Baikal World Natural Heritage site, it is located rather in bioms of Boreal Forests/Taiga,

Table 4. Comparison of the World Natural Heritage Sites in Northern Eurasia, which comprise steppe ecosystems with the nominated property "Landscapes of Dauria".

Site name	Criteria for inscription on the WH list	Biome according to the Udvardy's scheme	WWF ecoregion based on biogeographical provinces according to the Udvardy's scheme (terrestrial)	Geobotanical zoning of zone steppes of Northern Eurasia (Lavrenko, 1991)	The major steppe types and plant dominants	% of the total areaи
Landscapes of Dauria	(ix), (x)	Temperate Grasslands, Savannas, and Shrublands	**Daurian/Mongolian steppe** (Global 200) includes: Daurian forest steppe, Mongolian-Manchurian grassland	**Central Asian (Daurian-Mongolian)** subregion of Eurasian Steppe region **, 1. Daurian mountaine-forest-steppe** subprovince **of Khangai-Daurian mountaine-forest-steppe province,** 2. Mongolian steppe province East-Mongolian steppe subprovince	**Meadow steppes** *(Stipa baicalensis, Stipa krylovii, Filifolium sibiricum. Festuca spp., Leymus chinensis, Poa botryoides, rich with forbs:Scutellaria baicalensis, Adenophora stenanthina, Iris dichothoma, Clematis haxapetala, Gypsophyla dahurica, Stellera chamaejasme)* **True steppes** *(Stipa krylovii, Cleistogenes squarrossa, Koeleria cristata, Agropyron cristatum, Leymus chinensis Allium polyrhysum, Caragana stenophylla, C.microphylla,* less abundant same species of forbs*)* **Dry steppes** *(Stipa krylovii, Leymus chinensis, Artemisia frigida, Allium polyrhysum, Cymbarya dahurica,)*	> 50%
Ubsunur Hollow	(ix) (x)	1)Montane Grasslands and Shrublands, 2)Temperate Coniferous Forests, 3)Deserts and Xeric Shrublands	**Altai-Sayan Montane Forests** (Global200) include: Sayan Alpine meadows and tundra , Sayan montane conifer forests, Great Lakes Basin desert steppe	Central Asian (Daurian-Mongolian) subregion, Mongolian steppe province West-Mongolian Steppe subprovince	**Montane steppes:** meadow and herb-bunchgrass steppes,bunchgrass steppes *(Stipa krylovii, Agropyron cristatum, Cleistogenes squarrosa, Caragana bungeana, C. pigmaea)*	Steppes are spread only along 4 sectors out of 9 and make up a total of 10–25% of the whole natural reserve territory.

Site name	Criteria for inscription on the WH list	Biome according to the Udvardy's scheme	WWF ecoregion based on biogeographical provinces according to the Udvardy's scheme (terrestrial)	Geobotanical zoning of zone steppes of Northern Eurasia (Lavrenko, 1991)	The major steppe types and plant dominants	% of the total area
Golden Mountains of Altai	(x)	1)Temperate Coniferous Forests, 2)Montane Grasslands and Shrublands, 3)Deserts and Xeric Shrublands	**Altai-Sayan Montane Forests** (Global200) include: Sayan montane conifer forests, Altai montane forest and forest steppe, Sayan Alpine meadows and tundra, Great Lakes Basin desert steppe	**Central Asian (Daurian-Mongolian)** subregion Mongolian Steppe province Mongolian-Altai Mountain-Steppe subprovince	Altai State Nature Reserve **True steppes:** *Koeleria cristata, Stipa capillata, S. pennata, Artemisia frigida* **Meadow steppes:** *Phleum phleoides, Helictotrichon pubescens, H. altaicum, Stipa sibirica, Calamagrostis epigeios* **Deserted steppes:** *Achnatherum splendens, Carex eleocharis, Potentilla acaulis* **Steppe meadoes:** *Helictotrichon pubescens, Poa angustifolia, Carex pediformis, Iris ruthenica, Bupleurum multinerve.* Katun State Nature Reserve **Petrophytic variants of meadow steppes:** *Koeleria cristata, Helictotrichon altaicum, Stipa pennata, Carex pediformis (co-dominant species – Festuca valesiaca, Calamagrostis epigeios, Iris ruthenica, Allium nutans, Sedum hybridum, Seseli buchtormense, Orostachys spinosa)* **Shrub variants of stony steppes:** *Spiraea media, Cotoneaster melanocarpus, C. uniflorus* Steppe meadows: *represent mostly polydominant multispecies communities consisting both of the meadow-forest and meadow-steppe species (Lonicera tatarica, Spiraea media, Calamagrostis epigeios, Iris ruthenica, Dactylis glomerata, Artemisia sericea, Carex pediformis).* Rare communities **of herb-oat grass-sedge steppes and their shrub variants** *Sibiraea laevigata* (the Altai endemic species) were found in the western part of the reserve. The Ukok Plateau National Park **true steppes:***poa botryoides, koeleria cristata, agropyron cristatum, carex duriuscula, festuca pseudovina, aster alpinus, potentilla acaulis, artemisia frigida, bupleurum multinerve;* **Fescue steppes** - *festuca tschujensis, koeleria cristata, poa attenuata, stellaria petraea, aster alpinus, pedicularis abrotanifolia, silene jenisseensis, potentilla soongorica;* **cryophitic variants of festuca tschujensis steppes:** *Saussurea schanginiana, Carex rupestris, Minuartia verna, as well as Papaver pseudocanescens, Leontopodium ochroleucum, Clausia aprica, Ephedra monosperma, Iris potanini, Androsace septentrionalis, Artemisia pycnorhiza*	< 10 % (Ukok – up to 25%)
Saryarka	(ix), (x)	Temperate Grasslands, Savannas, and Shrublands	Kazakh steppe	**Black Sea-Kazakhstan subregion** Eurasian Steppe region, **West Siberian-Kazakhstan province, Central Kazakhstan** subprovince	**True steppes Herb-bunchgrass steppes:** *Stipa zalesskii, S. capillata, S. pennata, Helichryzum arenarium, Artemisia marschalliana.* **Herb-bunchgrass xerophilic herb-fescue-feather grass steppes:** *Stipa lessingiana, S. sareptana, Festuca valesiaca, Galatella tatarica, Tanacetum achilleifolium.* **Fescue-feather grass:** *Stipa lessingiana, S. capillata, Festuca valesiaca.* **Fescue-feather grass:** *Stipa capillata, S. zalesskii, Festuca valesiaca, Artemisia marschalliana, Potentilla acaulis.* **Feather grass-fescue with shrubs:** *Festuca valesiaca, Stipa zalesskii, S. capillata, Spyraea hypericifolia, S. crenata* **Semidesert:** *Atriplex cana, Anabasis salsa, Artemisia pauciflora, Camphorosma monspeliaca, Kalidium foliatum, Halocnemum strobilaceum, Halimione verrucifera (Chenopodiaceae family), Salicornia europaea, Ofaiston monandrum, Petrosimonia oppositofolia, P. triandra, P. seablites (Suaeda corniculata).*	About 30%
Danube Delta	(vii), (x)	Temperate Grasslands, Savannas, and Shrublands	Pontic steppe	**Black Sea-Kazakhstan subregion** Eurasian Steppe region, **East European** province, **Azov-Black Sea steppe** subprovince	**Psammophytic steppes (1%):** *Festuca beckeri, F. valesiaca, Carex colchica, Ephedra distachya, Secale silvestre, Elymus giganteus, Apera maritima, Chrysopogon gryllus, Daucus guttatus.* **Deserted steppes (less than 1%):** *Agropyron pectiniforme, Thymus zygis*	Psammophytic steppes 5596 ha (1%) Desert steppes 64 ha (less than 1%)

tundra) and out of the zone of flat steppes. Steppes similar to Daurian-Mongolian-type steppes can be found only here (Baikal-Lena Nature Reserve, Zabaikalsky and Pribaikalsky National Parks). However, these steppe regions represent the extra-zone inclusions within zone forest vegetation, which are attributed to the historical factor, climatic effect and the presence of carbonate rocks.

Furthermore, column 7 of Table 4 shows that various steppe ecosystems in the existing WH sites are presented differently, sometimes very poorly, quite often occupying only a small percentage of the total protected area. Dauria stands among them as a site with a very high percentage of the areas occupied by steppe vegetation (over 70%). According to this index, only Kazakhstan Saryarka is approaching this level (about 30%), while psammophyte edaphic variants of steppe ecosystems of Danube Biosphere Reserve occupy less than 1% of the territory.

However, most clearly the difference between World Heritage sites lying in the steppe zone of Eurasia is illustrated by the specificity of their flora. This can be confirmed by the content of the column 6 of Table 4, which characterizes the dominant species of plants and prevailing steppe communities.

Thus, no explicit analogues to the Daurian steppes have been found among the Eurasian sites inscribed on the World Natural Heritage List, which are located within the exten-

Fig. 48

Fig. 49

Fig. 48. Red-crowned Crane (*Grus japonensis*)

Fig. 49. A Black-winged Stilt
Fig. 50. The Borzya River valley

Fig. 50

sive steppe belt. Indeed, the Daurian-type steppes are a true natural phenomenon that is not repeated in the other (even adjacent) regions.

The property "Landscapes of Dauria" proposed for the inscription on the World Natural Heritage list includes vast areas of nearly undisturbed Daurian steppes. Therefore, it is a reasonable task to include the Daurian-type steppes into the WH sites, since it will broaden the representation of Temperate Grasslands biome in the World Heritage list and enhance the general representativeness of the List.

It is important to note that among all the high-ranking protected areas that are located within the Daurian steppe ecoregion and/or in the adjacent areas of Russia, Mongolia, and China, the region of the Daursky State Biosphere Reserve is suitable to the greatest extent for the aforementioned purpose. The reserve, along with the adjacent refuge "The Valley of Dzeren", the Mongol Daguur biosphere reserve and their conservation areas forms an extensive environmental complex where the steppes of the eastern part of the Steppe Eurasian belt are widely represented. The local steppes are typical of the entire ecoregion; they have proper natural characteristics and also are notable for a high level of preservation degree, since they are protected under Federal nature conservation acts. The steppe ecosystems within the Daursky reserve have not been subjected to any considerable anthropogenic impact for a long period of time. There are no other regions of pristine steppes in the entire eastern part of Central Asia (at least, within the Russian part), which would be larger and characterized by higher integrity level.

Since this nomination has been conceived as a cluster and trans boundary, the possibility of its future expansion should be envisaged already at this stage. It can be fulfilled by adding of one or several clusters which include the most preserved forest-steppe areas of the northern part of of Daurian steppe ecoregion (determination of the exact coordinates of such areas would require additional research). As a result, a unformed natural meridional "transecta" of the cluster type, reflecting the transition from the south taiga of Russia into steppes of Central Asia will be formed in the very heart of Eurasia. This phenomenon is worth being represented in the list of World Heritage of UNESCO.

It should be noted in conclusion that the process of this nomination expansion should take into account the location of a number of steppe protected areas of North-Eastern Mongolia lying further south, in the middle of Manchurian-Mongolian Grasslands-Dornod, Numreg, Toson Khulstai, Yakh-Nur, Lkhanchivadat.

B) TOREY LAKES – WETLANDS OF INTERNATIONAL IMPORTANCE

The wetlands are quite a common site in the contemporary UNESCO World Heritage List. Indeed, the areas of this type (deltas, estuaries, shallow waters, lacustrine-boggy complexes, etc.) are included into several tens of WH sites in different countries. It would seem that this subject has lost its topicality. However, the importance of the Torey lakes becomes obvious with allowance for the uniqueness of importance of any appreciably large wetland for the vast arid territories of East Asia.

Indeed, it is a known fact that entire Central Asia, as well as its eastern part comprising the Daurian ecoregion, belong to the category of arid areas; the presence of large basins for them is considered to be a large positive event. These basins surrounded by vast steppes or semideserts play the role of life-giving "oases"; they serve as drinking places and refuge for various animals, as well as habitats for diverse flora. The Torey Lakes, a part of the Daursky State Nature Biosphere Reserve, successfully play the role of this "oasis". These lakes give refuge to thousands of migrating birds flying along East Asian-Australasian flyway. That is why this area has the statuses of the "Important Bird Area" and the "wetland of international importance".

In this respect Torey Lakes are similar to the other wetlands with the status of World Heritage Sites, which also play an important role in supporting of seasonal birds migration as many thousands of birds concentrate in these areas on the route (e.g., the Do ana National Park in Spane, the Keoladeo National Park in India, lakes Ishkel and Srebarna in Tunisia and Bulgaria, respectively; the Djoudj National Bird Refuge in Senegal, etc.). Moreover, the Torey Lakes are not less importantthan the aforementioned World Heritage sites for such key indicators as flora and fauna diversity, presence of the "Red Data Book" and endemic species, (Table 5).

Furthermore, the Torey Lakes are unique due to specific ecological processes which make these lakes different from the above mentioned sites of World Heritage located in other regions of the world. Indeed this compact and mosaic area comprising two large, many middle-sized and small lakes, boggy and saline areas, floodplain and delta of the Uldza, distributaries and small islands, meadows and reed stands, demonstrates an extreme variety of contemporary ecological processes, which is further enhanced due to significant seasonal and years long fluctuations in salinity, water level and other hydrologic indicators of the local basins. The Torey lakes with inflowing two rivers form

their own closed basin. This, along with their characteristic 25-35-year cycle of development makes them truly unique. During these cycles, depending on the annual rainfall, the lakes are either filled or become completely dry.

Two sites that are similar to the Torey lakes for a number of parameters should be mentioned. Both of them belong to the Eurasian steppe belt; both comprise valuable wetland areas.

The first site is the "Saryarka – Steppe and Lakes of Northern Kazakhstan" (inscribed on the List in 2008 for the same criteria – ix and x). This site also comprises a complex mosaic of shallow wetlands; these lakes are also periodically subjected to strong fluctuations in water level up to complete drying. Furthermore, Saryarka is a well-preserved natural area that also has high protection status (the Kurgaldzhin and Naurzum Nature Reserves; the first one has been inscribed on the Ramsar List).

Meanwhile, one needs to take into account the fact that this site is located in the middle part of the Eurasian steppe belt. Saryarka's climate characterized by a more or less uniform distribution of precipitation over seasons strongly differs from that of the Torey Lakes where the dry winter and wet summer seasons are well-pronounced. Therefore, a number of features of the hydrologic regime of both wetlands differ fundamentally; their biota (flora and fauna) are considerably different as well.

The second site, in China, located slightly southward (Mongolian-Manchurian grasslands), is the biosphere reserve near lake Dalainor (Khulun). It is also surrounded by vast steppe areas, and It has been also given the status of a wetland of international importance and an Important Bird Area.

However, perfect analogy is out of the question. Lake Dalainor is a much larger and deeper reservoir with a flowing regime as opposed to the Torey lakes. There are no islands with numerous colonies of waterbirds characteristic of the Torey lakes. The above-mentioned mosaic and dynamic character of habitats, characteristic of Torey wetland, is expressed to a lesser degree on Lake Dalainor. Finally, Lake Dalainor undergoes greater anthropogenic pressure, its natural dynamics of water content is violated by Dalainor Hailar channel built during recent years. Let us add that this site has not been inscribed on the tentative World Natural Heritage List.

Thus, the Torey lakes occupy a respectable place among other wetlands of local and international importance and are characterized by a high degree of preservation. They correspond completely to the high protective statuses given to them (biosphere reserve, wetland of international importance, and bird protection area). Although these lakes are not large, however, they are the second largest lakes after Lake Dalainor throughout Northeast Asia from Lake Baikal to Khanka. This makes them especially important for migratory waterbirds (see below). Landscape mosaic of the Torey Lakes region, varying in time and space, combined with high biological diversity, makes this area a unique wetland polygon – a real "museum of limnology in the open air", where the diverse processes occurring in the pristine environment are demonstrated under the impact of climate changes.

CRITERION X

A) AVIFAUNA OF THE TOREY LAKES – DIVERSITY AND UNIQUENESS

The figures characterizing the diversity and uniqueness of the avifauna of the Torey lakes are within the level of the corresponding indices of the other wetlands of international importance that have been already inscribed on the World Natural Heritage List or have been recommended to be inscribed on the UNESCO List (Table 5).

For example, the key indices of the Daurian reserve for the avifauna (in this context, it is the Torey wetland area that mostly contributes to the total indices for the reserve) are as follows: 327 bird species, including 16 globally rare species (1–3 IUCN categories) and 40 species inscribed on the Red Data Book of the Russian Federation, seasonal gatherings at the lakes being as high as 3 million individuals in spring and up to 6 million individuals, in autumn (taking into consideration the passerines – significantly more). Approximately 150 breeding species have been reported for this area. All these facts are an illustrative demonstration of the exceptional role of the Torey lakes, which is played for the steppes of the Trans-Baikal region, Central Asia, and even entire Eurasia. Relating to certain rarest bird species, their international importance is also unique.

B) GLOBALLY RARE SPECIES OF MAMMALS INSCRIBED ON THE INTERNATIONAL RED BOOK

Dzeren – endemic of Central Asian steppes.
Since the contemporary habitat of dzeren is strongly limited, the survival of this species almost completely depends on the nature conservation measures, primarily on the efficiency of functioning of special protection areas and lack of barriers to migration in the Central Asian steppe zone.

Fig. 51. Demoiselle Crane family

From this viewpoint, the Daursky reserve, in addition to the adjacent refuge "The Valley of Dzeren" and the Mongolian strictly protected natural area Mongol Daguur are playing a special role. These protected areas have a multifunctional and exceptionally important role in the survival of the last truly mass ungulate migrant of Central Asia. Thus, a permanent, although relatively small local herd (approximately 7–8 thousand individuals) has been reported here. In addition, each winter up to 100 thousand animals come to spend 5–7 months here.

In this context, the nominated property resembles the Saryarka site located in North Kazakhstan, where another ungulate species, the saiga antelope is the key fauna species that are subject to strict protection. Analogies can also be drawn with the other World Natural Heritage Sites that have already acquired this status, where the most significant (in some cases the most important one) goal is to preserve a specific species: Simien National Park in Ethiopia (conservation of the endemic abyssinian goat), Okapi National Park in Kongo (the okapi), the Bwindi Impenetrable Forest (the mountain gorilla), etc. The special purpose of the "Ubsunur Hollow" site (Russia-Mongolia) and "The Golden Mountains of Altai" (Russia) is to conserve the snow leopard and argali; the mission of the "Western Caucasus" (Russia) and "Bialowieza Forest" sites is to conserve the European Bison.

Thus, the presence of the key habitats of dzeren, a globally rare endemic species listed in the International Red Data Book is a very important reason in favour of nominating this property for inscription on the World Heritage List.

It is obvious that, from the point of view of protection of the dzeren, there are only two appropriate competitors to "Landscapes of Dauria": the strictly protected area "Dornod Mongol", located in the South-Eastern Mongolia and the natural reserve "Toson-Hulstay." The first site is also used primarily as a winter stay place for dzerens of the matad population and does not differ from the nominated area in its importance. In addition, the concentration of the dzeren in the reserve "Dornod Mongol" for winter stay is partly a consequence of the impossibility of traditional migration to China through the area, due to the presence of ITS line at the border. The second one serves as one of the two main "maternity houses" for North-Kerul population, that is why it is extremely valuable but has a low conservation status.

Table 5. Comparison of the Torey lakes with other wetlands inscribed on the World Natural Heritage List, as well as the properties submitted on the Tentative List

	Title and area of a wetland within the World Natural Heritage Site	Conservation status	The total number of birds/ breeding/globally rare*	Maximum seasonal gatherings of birds*
Landscapes of Dauria (southern Trans-Baikal region, Russian-Mongolian border, Russia) tentative list: ix, x	The Torey lakes 85 thous. ha	Daursky State Biosphere Nature Reserve, Ramsar List, Important Bird Area	327/149/16	up to 3 million in spring up to 6 million in autumn
Saryarka (Northern Kazakhstan) ix, x	Lakes Tengiz, Kurgaldzhin, Aksuat, Sarymoiyn, etc. 250 000 ha	Naurzum and Kurgaldzhin reserves, the Ramsar List	about 300/120/no data available	up to 15–16 million
Volga Delta (Caspian Sea shoreline, Russia) tentative list: ix, x	3 clusters located in the Volga delta – 100 000 ha (5.5% of the total delta area)	Astrakhansky State Nature Biosphere Reserve, biosphere refuge, the Ramsar List, Important Bird Area	about 280 100/18	Several million individuals
Danube Delta (Black Sea shoreline, Romania) vii, x	Danube Delta 680 000 ha (85% of the total delta area)	Biosphere refuge, the Ramsar List	over 300/180/no data available	Several million individuals
Srebarna (Black Sea region, Bulgaria) x	Lake Srebarna 600 ha	Biosphere refuge, the Ramsar List	about 180/100/9	No data available
Doñana (southern coast of Spain) vii ix x	Guadarquivir River Delta-«Marismas» 25 000 ha	National park, Biosphere refuge, the Ramsar List	over 350/no data available/ no data available	Several million individuals
Sundarbans (Bay of Bengal coast, India/ Bangladesh) ix x	The joint delta of the Gang and Brahmaputra rivers; 4 regions – about 300 000 ha (4% of the total delta area)	India: National park; Bangladesh: three wildlife sanctuaries	over 300/no data available/ no data available	Several million individuals
Keoladeo (Northern India) x	Complex of small lakes, 2 900 ha	National park, the Ramsar List	about 350/ no data available/no data available	No data available
Ishkel (North Africa, Tunisia) x	Lake Ishkel 12 600 ha	National park, biosphere refuge, the Ramsar List	over 200/no data available/3	up to 300 000–400 000
Djoudj (West Africa, Senegal) vii, x	Lower reach of the Senegal River, 16 000 ha	National bird refuge, the Ramsar List	about 300/no data available/no data available	up to 3 million

Manul (pallas cat, Otocolobus manul)

This kind of the wild cat listed as globally rare and is categorized by IUCN as Near Threatened. Although the habitat of the manul is relatively wide (Armenia, Azerbaijan, China, Russia, India, Iran, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Turkmenistan, Uzbekistan), it can be found only in the most remote and undamaged areas of Central Asia, as a rule, in uneven steppes and semi-deserts with rocky outcrops. The Daurian steppes are one of its safe refuges, the manul is rather numerous (300–400 animals) here and is under special protection.

Fig. 52. An adult female Mongolian Gazelle

Other rare species

It should be noted that at least five species of mammals, which are endemics of the Daurian steppes live in the nominated property, including the Daurian hedgehog (the Least Concern status in the IUCN Red List), the Daurian zokor (the Least Concern status in the IUCN Red List), the Daurian gopher (the Least Concern status in the IUCN Red List) and the Central Asian endemic – Mongolian marmot or tarbagan (the Endangered A2ad status in the IUCN Red List).

To summarize, let us note that when talking about the Daurian steppe ecoregion, we deal not just with one of the last preserved fragments of the primary Central Asian steppe (which itself is of great significance), but also with a unique historical landscape that is typical of the former, pristine and uninhabited Central Asia. Indeed, in addition to steppes, it is here that a viable population of large ungulate species, which is characterized by long-term migrations and is an emblem of the Central Asia (dzeren), has been preserved. The other native representatives of fauna can be found here, as well. It is here, on the Torey Lakes, which are real "source of biodiversity", that numerous birds are concentrated.

There is also another important argument resulting from the analysis of the international distribution pattern for the World Natural Heritage Sites. Indeed, the nominated property is known to be located in the eastern part of the Central Asia, i.e., in a very vast region encompassing the southern part of the Russian East Siberia, Baikal and the Zabaikalsky Krai, the northern and eastern parts of Mongolia and north-eastern part of China. Only two World Natural Heritage sites have been located here so far: the "Ubsunur Hollow" (Russia–Mongolia) and "Lake Baikal" (Russia). It has been demonstrated that both these sites fundamentally differ from the proposed Daurian property

Next, the Tentative Lists submitted by Mongolia contain two properties that could be geographically attributed to the eastern part of Central Asia. However, both of them are located far outside the Daurian steppe ecoregion, thus being characterized by different natural parameters (climate, relief, biota composition, etc.). One of those is located in the south-eastern part of the country in the Great Gobi Desert and is a proposed for nomination Natural Heritage Site; the other one comprises the taiga high-mountain region near Khovsgol lake in northern Mongolia (Khovsgol lake Tsaatan Shamanistic Landscape) and is proposed for nomination Natural and Cultural Heritage Site.

Therefore, the appearance of the third property with a high global status ("Landscapes of Dauria" could become it) in this region would make the international distribution pattern of these sites more uniform. This would be totally in line with the Global Strategy that has been implemented since 1994 and would acquire the World Heritage List a more well-balanced, representative and adequate character with the purpose of representing the natural and cultural diversity of the world to the fullest extent and encompass all major geographic regions of our planet.

Fig. 53. Pallas' Cat, the only representative of the Felidae in the nominated property

Fig. 54. Pallas' Cat kittens

Fig. 55. A chick and nest of the Demoiselle Crane

OVERALL CONCLUSION: No explicit analogues of the ("Landscapes of Dauria" have been revealed in the current World Heritage List (the existing World Heritage Sites) or the Tentative List (the sites recommended for the inscription). This transboundary Russian–Mongolian territory, which vividly represents one of the most valuable landscapes in the eastern part of Central Asia, is the best option for filling the existing gap on the global map of distribution of the World Natural Heritage Sites. The nomination is recommended to be strengthened in the future by adding of new clusters representing other protected areas of the Daurian steppe ecoregion, which include not only the steppe areas but forest-steppe regions as well.

3.3 Proposed Statement of Outstanding Universal Value

THEREFORE, THE APPEARANCE OF THE THIRD PROPERTY WITH A HIGH GLOBAL status ("Landscapes of Dauria" could become it) in this region would make the international distribution pattern of these sites more uniform. This would be totally in line with the Global Strategy that has been implemented since 1994 and would acquire the World Heritage List a more well-balanced, representative and adequate character with the purpose of representing the natural and cultural diversity of the world to the fullest extent and encompass all major geographic regions of our planet.

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A) BRIEF SYNTHESIS

The Daurian ecoregion is the only region in the world where the transition of the ecosystem complex from the circumboreal taiga forest biom to the temperate continental grassland biom remained completely under natural condi-

tions. It is characterized by a cyclic changing gradient of climate conditions from cold humid taiga forest climate to strong continental semiarid steppe climate, by extraordinary diversity of different ecosystems and species, which are adapted to extreme cyclic changes of life conditions. The proposed property represents the "steppe compartment" of the complex ecoregion; it includes large and small lakes and wetlands in a unique landscape feature.

Cyclic climate changes of wet and dry periods are the reason for extreme changes of water supply in the closed Torey Lakes basin as well as extreme changes of life conditions for plants and animals. The adaptation of ecosystems and species populations in the ecoton is an on-going biological and ecological process of global importance.

The nominated property with the large steppe lakes is the key resting place for more than 3 million migrating birds within the East Asian-Australian flyway of waterfowl, one of the most important and longest flyways all over the world. A total of 16 globally endangered bird species inscribed in the IUCN Red List have been observed in this territory. The territory is of key importance for conservation of natural massive transboundary migration routes of dzeren, which is the last grandiose phenomenon of this type in Central Asia.

B) JUSTIFICATION FOR CRITERIA

Criterion (ix)

The nominated property "Landscapes of Dauria" is an outstanding example representing significant on-going ecological and biological processes in the evolution of the diversity of ecosystems and species within a relatively small environmental area, which includes grassland steppes, forest-steppes and wetlands of high significance and a wide range of biodiversity.

Criterion (x)

This relatively small territory which comprises grassland steppes, forest-steppes and intrazonal wetlands is extremely important habitats for wide range of animals and plants including a number of rare and endangered species, especially dzeren (Mongolian Gazelle), a globally rare endemic species listed in the International Red Data Book. It is also a major stopover place for migratory birds on the Asian-Australasian Flyway.

C) STATEMENT OF INTEGRITY

The nominated property contains within its boundary all the elements necessary to express its OUV including the presence of pristine grasslands and forest-steppes as necessary habitat of dzeren (Mongolian Gazelle) and wetlands, lakes and rivers as an important location of the migratory birds' species, as well as the variability of ecosystems under natural conditions.

Natural conditions of the "Landscapes of Dauria" have been relatively well preserved due to several reasons such as being less populated and not affected by adverse economic activities, except farming that has been developed to a limited extent. Within the nominated territory the complete spectrum of species common to this natural and climatic zone has been preserved or built back.

E) REQUIREMENTS FOR PROTECTION AND MANAGEMENT

Nowadays the high status of the special protected areas within the property ensures the conservation and further natural development of the unique ecosystem complex. Any economical or business activities are prohibited on the territory of the SPAs and restricted within their buffer zones.

Existing since 1994, China-Mongolia-Russian "DAURIA" International Protected Area (CMRDIPA), which includes the nominated territory, provides additional guarantees of its safety.

The special protected areas within the property possess enough financial and administrative resources for long-term conservation of the property`s Outstanding Universal Value.

Fig. 56. Great Bustard (*Otis tarda*).

The Natural Heritage Protection Fund was established in 2000 in compliance with article 17 of the UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage. The Fund's priority is the overall support of World Heritage properties, as well as obtaining this status for new natural sites both in Russia and the CIS. http://www.nhpfund.org

Daursky State Nature Biosphere Reserve was established in 1987 for the protection and investigation of typical and unique landscapes of North Dauria and protection of key places of habitat of many rare species. Priority directions of Reserves activity are the scientific researches, environmental education and promote the sustainable development of the territory. From 1994 has status of Wetlands of International Importance (Ramsar Convention), from 1997 – Biosphere Reserve (in compliance with Program Man and Biosphere), from 2004 – International Bird Area, from 1994 – part of China-Mongolia-Russian Dauria International Protected Area.
http://www.daurzapoved.ru

Mongol Daguur Strictly Protected Area was established in 1992 in accordance with international standards for nature areas of the highest rank for the protection and investigation of typical and rare landscapes and rare species habitats. Key directions of activity are the protection, environmental education and scientific researches. From 1997 has status of Wetlands of International Importance (Ramsar Convention), from 2007 – Biosphere Reserve (in compliance with Program Man and Biosphere), from 2007 – International Bird Area, from 1994 – part of China-Mongolia-Russian Dauria International Protected Area.

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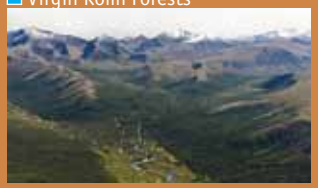

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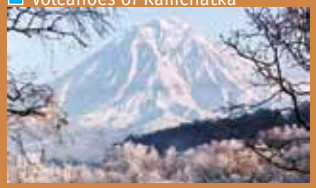

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