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CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE  
AND NATURAL HABITATS

**Group of Experts for the Setting up  
of the Emerald Network of Areas of Special Conservation Interest**

**Emerald Network Pilot Project in Armenia**

**-Report-**

## **1.Introduction**

The Armenian plateau, including territory of the Republic of Armenia has been inhabited for over 600 thousand years, since man first arrived in the region. Paleolithic tools dating back more than 100 thousand years have been found in the country, which has a number of important stone age sites. During the Paleolithic era, hunting was widely practiced, and the farming first developed. By the end of the Paleolithic and throughout the Mesolithic periods farming and animal husbandry continued, and replaced the previous hunter-gatherer existence. The Armenian Plateau is therefore regarded by some scientists as one of the original centres for early farming and livestock breeding in the world. Domestication of a range of plants and animals followed, as well as the development of metal use and early artificial irrigation.

Armenians as a nation have preserved their spiritual and cultural independence and remained faithful to their traditions for thousands years. Armenian culture has also affected that of neighbouring countries, and has influenced cultures elsewhere in the world.

Armenian architecture, urban construction and constructive art, medieval miniature painting, carpets, poetry, music, painting, farming and live-stock farming have an important place in world culture.

Today, over 97% of the population of the Republic of Armenia consists of native Armenians. Of 8 million native Armenians around the world, approximately 3.8 million live in Armenia (the rest are living in around 60 different countries, notably in the Russian Federation, the USA, France, Georgia, and Iran ).

### **1.1 Geographic location and borders**

The Republic of Armenia is a landlocked country with a total area of 29,74 km<sup>2</sup> (2,974,259 ha), located about 145 km from the Black Sea, 175 km from the Caspian Sea, 750 km from the Mediterranean Sea and 960 km from the Persian Gulf. It lies between 38°05'-41°18' N and 43°02'-46°37' E and measures 400 km at its longest point (north-west to south-east), and 200km east-west, with a narrow projection (Zangezur) in the south-east. Armenia borders four countries (Georgia , Azerbaijan , Iran and Turkey ), with a total of 1479km of border. The country of Armenia covers over 10% of the Armenian plateau, which is 500 m higher than the neighboring Asia Minor and Iranian plateaus. Relatively recent volcanic activity on the Armenian plateau has resulted in large volcanic formations, and highlands consisting of a series of both small and large mountain massifs. The largest lakes (Sevan, Van and Urmia) have also been formed as a result of tectonic activity in the Armenian plateau.

### **1.2 Physical geography**

Since early geological history the land surface of Armenia , and the surrounding Armenian plateau, has been mountainous, with further mountain building occurring during the Cenozoic era

(particularly after the Miocene). These complex tectonic shifts have resulted in a country dominated by a by a series of mountain massifs and valleys. The tectonic movements which created the series of folded ridges which dominate the country, also resulted in extensive volcanic activity. The climatic changes over the last million years have also left their mark on the country, with evidence of two glacial periods (Riss and Wurm) preserved on almost all mountains over 3000m. Four main geographic/geological regions can be recognised within Armenia including: Mountainous ridges and valleys in the north-east of the country (highest altitude 3101m), which occur mainly in the basin of the River Kur (including the ranges of Virahajots, Bazum, Pambak, Gougarats, Areguni, and Sevan) and which are subject to extensive erosion.

Regions of volcanic origin within Asia Minor, including the mountain ranges of Ashotsk, Aragats, Gegham, Vardenis, Suniq and Mount Aragats (4090m). These areas are covered by lava of relatively recent origin (upper Pliocene). Such regions are characterized by gentle slopes, and little evidence of erosion, although larger rivers have carved out deep gorges and canyons.

A series of ridged mountains adjacent to the River Arax (ridges on the left bank along with the Urts-Eranos, Teksar, Vayq, and Zangezour mountain ranges, including the peak of Kapoutdjugh at 3094 m) constitute the Minor Caucasian system. This area is prone to intense erosion.

The Ararat Valley represents the lowest part of the Ararat depression (which is still undergoing tectonic movement). This area is covered with alluvial and proluvial sediments. As previously stated, Armenia is generally mountainous, with the lowest point 376 m above sea level in the Debed River gorge in the north on the border with Georgia and the highest point 4090 m at northern peak of Mount Aragats. Overall, the average altitude across the country is 1850 m, but the variations in altitude (up to 3700m, but more generally 1500-2000 m) have important effects on the climatic and landscape zones within the country. Furthermore, the position and gradient of slopes have important implications for the distribution of biodiversity in the country. The steepest slopes found are within mountain folds, but in contrast, over 74% of the land (21, 000 km<sup>2</sup>) consists of slopes of up to 12°, which are generally under cultivation. Among the ridged mountains and valleys of the Minor Caucasus, most forests occur on north-facing slopes.

### **1.3 Climate**

A great range of climatic zones have been recorded within Armenia. The country is located in the sub-tropical zone, and thus is prone to arid (desert and semi-desert) conditions. However, the altitudinal variation within the country results in further variation in climatic zones, in addition to existing latitudinal clines.

The country receives high levels of sunshine ranging from 1700 (Gugarats Ridges in the Northeast) to 2,800 hours per year (shore of Lake Sevan). The average temperature throughout the year varies geographically from 2.7°C (Mount Aragats) to 140C in Meghri on the border with Iran.

July and August are the warmest months with absolute highest recorded temperature 41.8°C, while average minimum temperatures recorded in January vary from -3.1°C at Meghri, to -18.9°C at Berdashen at north-east.

Average precipitation of 550mm varies between 200-250 mm in the dry Ararat Valley and 800-1,000 mm in the mountains. Most precipitation occurs in the spring, while the second half of the summer is dry. Relative humidity averages 60% (ranging from 44% in summer to 80% in winter). Long-lasting snows exist on mountains over 1300 m. In these areas snowfall may reach 2 m, whilst snowfall reaches 0.5 m on the lower steppes.

### **1.4 Water resources**

Armenia has limited water resources. In total the country receives a total of 18 km<sup>3</sup> water

throughout the year, mainly from rainfall, however 2/3 of this is lost by evaporation. The rivers in Armenia belong to the basin of River Kura, which flows into the Caspian Sea. Two major river systems are present in Armenia - Debed basin (7890 km<sup>2</sup>) and Arax basin (21900 km<sup>2</sup>). The average density of river networks throughout the country is equivalent to 0.4 km/km<sup>2</sup>. These rivers are mainly fed by snowmelt, rain and underground waters. Extensive flooding occurs in spring as a result of runoff from snow melt and heavy rainfall. Overall, the flow in rivers totals 7 km<sup>3</sup>, however this may fall to 5 km<sup>3</sup> at some times. The rivers represent a potentially important resource, not just for water supply and irrigation, but also for hydroelectric power (estimated to be equivalent to 1.7 million kWt).

Armenia has a number of lakes, of which the largest is Lake Sevan. Details of the smaller lakes are summarized in Table 1.3. In addition to its rivers and lakes, a number of reservoirs have been constructed in Armenia (including Akhourian, Lake Arpa, Abaran, Azat, Spandarian, and Tolors; Annex 1) which help regulate water supply in the country.

### 1.5 Soils

A wide range of soil types are found in Armenia, including 14 main soils. However, the country is extremely poor in fertile lands suitable for agriculture. In the Ararat Valley clay or clay-sand soil predominates, and the land is generally wet and rocky. In contrast, mountain meadow soils have the highest humus content (up to 12%, average 9%), which compares favorably to humus content in other areas (4-9% in forests, and 2% in deserts).

### 1.6 Main landscape zones

The mountainous nature of Armenia results in a series of highly diverse landscapes, with variations in geological substrate, terrain, climate, soils, and water resources. These landscapes support a great variety of habitats, which support distinctive flora and fauna, and different human use. Seven distinct landscape zones are described in Armenia: deserts, semi-deserts, dry steppes, steppes, woodlands, sub-alpine and alpine lands.

#### Altitudinal landscape zones

Small sized sand accumulations in Ararat Marz result in *desert regions* at 800-850 m above sea level. *Semi-deserts* occur at different altitudes (400-1,250 m) in Ararat, Armavir, Vayots Dzor marzes, as well as in the lowlands of Aragatsotn Marz and the most southern part of Syunik Marz. The total area of deserts and semi-deserts is 4,450 km<sup>2</sup>.

*Dry mountain steppes* (1,300 -1,800 m, precipitation 400-600 mm per year) are found on considerable parts of Shirak, Aragatsotn, Gegharkunik, and Kotayk marzes and to a lesser extent in Vayots Dzor and Syunik marzes. *Wet mountain steppes* (1300-2400 m, precipitation 600-1,000 mm per year) are found at similar or higher altitudes of dry steppes on highlands throughout the country. Mountain steppes occupy the area of 9,991 km<sup>2</sup>.

*Shrubs* and *forests* cover the mid-zone of the mountains in the northern marze (500-2,100 m) and up to 2,500 m in Gegharkunik Marz and the southern marzes. The area of shrubs and forests is 4,599 km<sup>2</sup>, from which 3,341 km<sup>2</sup> are covered by forests.

*Sub-alpine meadows* occur between 2,000m and 2,800 m in the northern marze, between 2,500m and 3,600 m in Gegharkunik Marz and up to 3,800 m in the southern marzes. Sub-alpine meadows cover an area of 8,503 km<sup>2</sup>. *Alpine meadows* have 2,200 km<sup>2</sup> areas within the boundaries of 2,800-4,000 m above sea level.

*Azonal landscapes* occur independently on the all altitude landscape zones. They include mostly the following three categories: *Rocks and stone taluses* usually occur on very steep slopes (>30°) but also on flat areas in a form of lava extrusions.

*Wetlands* according to the Ramsar definition\* cover 6.17% of the total territory of the country (1,774 km<sup>2</sup>); of them 5.51% (1,584 km<sup>2</sup>) is open water (lakes, ponds, rivers, reservoirs, canals), 0.52% (150 km<sup>2</sup>) is temporarily flooded area (saline flats in river plains), and 0.14% (42 km<sup>2</sup>) are permanent marshes, fens and peatlands.

**Human made landscapes** include *crops* (wheat, barley, rye, potato), *orchards* (apple, pear,

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\* as stated in the Article 1.1 of the Text of the Convention on Wetlands "wetlands are areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt..."

apricot, peach) and *vineyards*, *rural* and *urban settlements* and *excavations* (sand and gravel pits, polymetallic mines).

## 1.7 Flora

There are about 3600 species of wild-growing vascular plants in Armenia and the diversity of ecosystems and landscapes includes various elements ranging from sand deserts and wormwood semi-deserts to subalpine and alpine meadows with numerous transitional associations. To imagine the wealth of this flora it is worthwhile to mention that more than the half of the flora of the Caucasus (about 7200 species) occurs in Armenia, which occupies only 6.7% of the whole territory of the Caucasus. In particular, plant density in Armenia is rather high - about 100 species per 1 km<sup>2</sup>.

Along with diversity, the flora of Armenia has also its unique features. Thus, there are over 125 endemic species growing only in Armenia, a rich agro-biodiversity of wild-growing relatives of cultivated plants, including a singular gene stock of wild-growing cereals (wheat, barley, rye etc.), tertiary relicts (juniper, yew, rhododendron etc.). It is noteworthy that Armenia serves as habitat for medicinal, decorative, technical, edible, fodder and other plants as well as probably those with yet unknown properties. The botanical resources of Armenia, and their use, have been studied since the 15th century (A. Amasiatzi), with more extensive inventories, basic plant assessments and detailed studies of herbal use being made in the 19th century (e.g. K.Koch, Radde, Grinevetski, Shamiramyan).

Vegetation mapping and geo-botanical studies have been carried out since the 1920-30s, starting with an inventory of pastures and rangelands. Since then a number of distinct floristic regions have been determined, and vegetation of all the main habitat types has been studied to some extent. Furthermore the distribution and chemical composition of plants of industrial and commercial value were also investigated.

At present all groups of Armenian flora (lower and higher plants) are not equally well known the best studied being fungi and flowering plants. As the result of extensive research a seven volume work was published documenting fungi and related groups ("The Mycoflora of Armenia"). However, this was not exhaustive and a further three volumes are still to be published on studies of other fungal groups. Extensive studies of vascular plants have been carried out since the 1954 (the work of A. Takhtadjian), and have culminated in the production of ten volumes documenting vascular plants ("The Flora of Armenia"). The last volume on Gramineae will soon be published. In comparison to these two groups, other flora is less well studied.

### □ Endemic plant species

Armenia is positioned at the junction of several bio-geographical regions, and consequently contains a wealth of botanical diversity. These bio-geographical zones are closely linked, and the lack of isolation results in relatively few endemic species. Overall, 126 species of endemic plants are recorded (representing 3% of the total Armenian flora, and 1.5% of flora found across the Caucasus).

In addition, Armenia contains a number of regional endemics which are also found at a limited number of sites in neighboring countries. For example, *Campanula massalsky* only grows in one site outside Armenia (in Turkey), and *Cousinia gigantolepis* only grows in the southern province of Armenia and in sites in northern Iran. Overall, over 300 species are endemic to the Armenian-Iranian region.

The endemic flora of Armenia is of relatively recent origin (dating from the Quaternary or Holocene), with no ancient endemic species recorded. This reflects the relatively recent diversification of flora in the region, which has resulted in the current botanical richness of Armenia. The distribution of endemics corresponds closely with climate, and most are found in the southern and central arid zones of the country (Table 3.3). In particular Darelegis and Erevan floristic regions show high numbers of endemics (with 40 species each).

#### □ **Relict plant species**

Relict species, which have been preserved since geological time practically unchanged, are an important component of Armenia's botanical diversity. It is estimated that more than 500 relict species occur, although accurate determination is limited by gaps in the fossil record. Some species, such as Oriental beech (*Fagus orientalis*), which originated in the Tertiary period are well adapted to today's conditions, and compete well with younger species. Other relicts are widely spread but are only associated with particular habitats (e.g. yew, Caucasian rosebay), while some species are restricted to specific sites or refuges, e.g. Oriental plane (*Platanus orientalis*) and male fern (*Dryopteris filix-mas*). There is also evidence of relict fungi species occurring in deserts and steppes including *Podaxis pistillaris* and *Battarea phalloides*.

#### □ **Rare and declining plant species**

Threatened plant species have been recorded from all regions. Many of rare and threatened plants in Armenia are associated with 20,000 ha wetland loss. The main reasons of destruction the wetlands were combat against diseases, conversion from its natural state to agricultural land and creation of reservoirs. Remaining wetlands have been degraded by wrong land use practices, resulting in inevitable damage to these ecosystems and associated flora. However, a number of other threats affect water plants. Water-marsh systems alone contain 45 plant species which are considered to be in need of conservation attention.

At present, fungi (including mushrooms) have not been included in the Armenian Red Data Book. A number of species of fungi appear to be declining as a result of direct and indirect human impacts. Some cap mushrooms are considered to be on the verge of extinction and should be listed in the Armenian Red Data Book. Overall, 15 species of fungi are considered to be critically endangered.

#### □ **Red-listed plant species**

The Armenian Red Data Book for plants was published in 1990, having been under preparation for 15 years (including 5 years in press). Publication of these works involved substantial review of the species concerned and the selection criteria used. However, recent socio-political change has led to revision of priorities for conservation, and the need for quantitative indicators and impartial criteria has been recognised. The current listings include many rare species which are not threatened, but exclude a number of species undergoing population declines. New criteria based on quantitative indicators were proposed by the World Conservation Union - IUCN have been used in the most recent IUCN Red Lists, but further research will be needed to apply them to both the flora and fauna of Armenia.

At present Armenian biodiversity faces serious threats, and as many as half of all plants in the country may require some conservation action. This is not reflected in the Red Data Book which represents only the most highly threatened species and lists only 387 species (12% of the flora).

### **1.8 Fauna**

Although records of the animals of Armenia date back to the 4th century AD, and have been described by national and foreign naturalists since then, the first systematic study of the fauna of the region was published in 1841 ('The Fauna of Caspio-Caucasica', Eichvald). Indeed, until the Soviet era most of the extensive zoological surveys were conducted by foreigners. This changed in the 1930s, through the work of one of the founders of zoological study in Armenia, A. Shelkovnikov. His work resulted in monographs devoted to various insects and birds. Further zoological studies followed, including the publication of 'The Fauna of Armenia' in 1954 (S. Dal), and work on herpetology (in particular, parthogenesis in lizards). Since the 1950s zoological research has continued on various groups (including molluscs, arachnids, beetles, ticks, amphibians, reptiles, birds and mammals), with studies focusing on their taxonomy, zoogeography, ecology and behavior, as

well as issues relating to their conservation. The number of vertebrates in the fauna is over 500 species where birds prevail with about 350 species, while the number of invertebrate species is about 17,000.

□ **Fish**

Fish belonging to five orders are found in Armenia (Salmoniformes, Cypriniformes, Siluriformes, Cyprinodontiformes, Perciformes). A total of 40 species of fish are recorded in Armenia. Important and widely distributed species are shown below, of which up to six are introduced (nonnative) species.

□ **Amphibians**

A total of 8 amphibian species are found in Armenia . Most of these species are generally widespread, such as European marsh frog (*Rana ridibunda*) brusa frog (*R. macrocnemis*), European green toad (*Bufo viridis*). European tree frogs (*Hyla arborea shelkovnikovi*, and *H. savigni*) are less common and the Syrian spadefoot toad (*Pelobates syriacus*) is listed in the Red Data Book. In addition, a further species was recently found in Armenia – an isolated population of banded newts (*Triturus vittatus*) outside their normal distribution

□ **Reptiles**

Armenia is recognised as having one of the most interesting reptile faunas in the former Soviet Union. Of 156 reptiles recorded from across the USSR, a total of 53 are present in Armenia, many of which are both endemic and threatened.

□ **Birds**

The position of Armenia , and its varied ecosystems and climate, result in relatively high bird diversity in this country. Bird faunas of Europe, the Mediterranean and the Middle East are represented. A total of 351 bird species are recorded from Armenia , and birds constitute over 60% of the vertebrate fauna of the country. The lakes of Sevan and Arpi, along with the Ararat Valley are of great importance for wetland birds, and are used by migrating species. Together these sites support 145 species of waders and waterbirds.

□ **Mammals**

The mammals represent the second largest vertebrate class in Armenia , after birds, with 83 species recorded in the country (Table 2.15). Over the last 10 years research has identified the presence of seven bat species which had not previously been recorded. These include the greish long-eared bat (*Plecotus austriacus*), western barbastelle bat (*Barbastella barbastella*), Leisler's bat (*Nyctalus leisleri*), Nathusius's pipistrelle (*Pipistrellus nathusii*), Savi's pipistrelle (*Hypsugo savii*), particoloured bat (*Vespertilio murinus*) and the European free-tailed bat (*Tadarida teniotis*).

• **Endemic animal species**

Of about 17,500 animal species recorded in the country, 329 are endemic to Armenia. These include a wide range of invertebrates (including *Phytodrymadusa armeniaca*, *Nocarodes armenus*, *Olophrum aragatzense*, *Amphycoma eichleri*, *Cantharis araxicola*, *Tomomyza araxana*, *Bombilius schelkovnikovi*, *Shadinia akramowskii*, and *Gabiella araxenai*), as well as a number of vertebrate species and sub-species.

Nine species and sub-species of fish are endemic to Armenia. These include the endemic species of Sevan trout (*Salmo ishkhan*), and its four races or sub-species (winter ishkhan *S. ishkhan*; gegharquni *S. ishkhan gegarkuni*; bojak *S. ishkhan danilewskii*; and summer ishkhan *S. ishkhan aestivalis*), which occur in Lake Sevan and surrounding rivers. In addition, the following sub-species of fish are also endemic to Armenia: Armenian roach or 'karmrakn' (*Rutilus rutilus schelkovnikovi*), Armenian riffle minnow or 'tarekhik' (*Alburnoides bipunctatus armeniensis*), 'koghak' (*Varicorhinus capoeta sevangi*), Sevan barbel or 'beghlu' (*Barbus goktschaicus*), and Armenian white bream (*Blicca*

*bjoerkna derjavini*). Populations of brown trout (*Salmo trutta*), which until recently was found in all rivers in Armenia and catfish (*Silurus glanis*) have reduced significantly as a direct result of human activities such as intensive poaching, reservoir pollution unlimited water use and uncontrolled fishing. Of 53 reptile species found in Armenia, 7 are endemic. These include several species of rock lizards including *Lacerta unisexualis* (white-bellied lizard, found in the Sevan basin, and surrounding areas), *L. armeniaca* (the Armenian lizard, found in the north of the country), and *L. nairensis* (found around Hrazdan river and Lake Sevan). Other endemic species and sub-species include *Eremias arguta transcaucasica* (the racerunner, from Lake Sevan basin), *Vipera darevskii* (Darevsky's viper, from Djavahk mountain range at 2000- 3000 m), and *V. raddei boettger* (Armenian Radde's Rock Viper, endemic of Armenian Plateau and Lesser Caucasus). Regional endemics (restricted to the Armenian plateau) include several rock lizards (*Lacerta dahli*, *L. rostombekovi* and *L. valentini*).

No true endemic bird species are found in Armenia, although the Armenian gull (*Larus armeniacus*) is considered to be an endemic, and has been recorded in Lake Sevan basin, along the Arax, Hrazdan, and Akhurian rivers, and in recent years in Ararat valley. In addition, the Caucasian grouse (*Tetrao mlekosiewiczi*), which is endemic to the Caucasus, occurs in Armenian highlands.

Among 83 mammals recorded in Armenia, six endemic species or sub-species are recorded - Transcaucasian mole vole (*Ellobius lutescens*), Vingradov's jird (*Meriones vinogradovi*), Minor-Asian jerboa (*Allactaga williamsi*), the Caucasian birch mouse (*Sicista caucasica*), the Armenian mouflon (*Ovis orientalis gmelinii*), and a sub-species of Natterer's bat (*Myotis nattereri araxen*). Of particular note is the Armenian mouflon which is now restricted to areas in southern Armenia.

#### □ **Relict animal species**

Few relict animal species have been recorded from Armenia. One sub-species of fish, a roach ('Armenian karmrakn', *Rutilus rutilus schelkovnikovii*) appears to be a relict of Tertiary origin, which has been preserved within the Metsamor basin. Two birds, the white-winged scoter (*Melanitta fusca*) and the boreal owl (*Aegolius funereus*), are also considered to be relict species.

#### □ **Rare and declining animal species**

Studies of around 316 endemic species and sub-species, have revealed that around 100 of these are rare or declining.

A number of invertebrate and vertebrate species are listed in the Red Data Book for Armenia, and many more are now considered to be undergoing decline. Studies of around 316 endemic species and sub-species have revealed that around 100 of these are rare or declining.

The vertebrates species of key concern include a number of sub-species of fish, which have been threatened by decline in the water level of Lake Sevan and by over-fishing. For example, 'winter ishkhani' (*Salmo ishkhani*), which previously made up 30% of Sevan troutstocks, as well as 'bojak' (*S. ishkhani danilewskii*) have disappeared, while spawning of 'summer ishkhani' (*S. ishkhani aestivalis*) and 'gegharkuni' (*S. ishkhani gegarkuni*) has been disrupted by both the decline in the level of Lake Sevan and use of rivers for irrigation purposes, leading to declines in this Populations of 'summer ishkhani' and 'gegharkuni' are currently maintained exclusively through artificial breeding. The population of Sevan barbel or 'beghlu' (*Barbus goktschaicus*) declined following the changes in Lake Sevan leading to habitat loss, and this species along with 'ishkhani' is now listed in the Red Data Book of Armenia.

Many Armenian reptiles are threatened, including a number of endemics and regional endemics. Threatened species include the Transcaucasian ratsnake (*Elaphe hohenackeri*), Radde's Rock Viper (*Vipera raddei*), and Schneider's skink (*Eumeces schneideri*) among others. The population of the steppe racerunner (*Eremias arguta*) in Lake Sevan basin, is the only one in the Caucasus.

A number of semi-desert and alpine bird species are considered threatened, vulnerable or extinct, while status of many others has not yet been determined. Research many of these species is limited,



but such birds appear to be under increasing threat. Among mammals, the distribution and population of Armenian mouflon (*Ovis orientalis gmelinii*) have declined as a result of habitat loss, disturbance and poaching. This species has undergone a significant range reduction during the last 20 years, when it has disappeared from the Ararat Valley, and is now restricted to sites in southern Armenia.

- **Red-listed animal species**

A national Red Data Book for Animals has also been published, and the Armenian Red Data Book for invertebrates is in preparation. From around 17,500 species of invertebrate and vertebrates recorded in Armenia, approximately 300 are considered to be rare or declining. Preparation of the Red Data Book for invertebrates indicates that over a hundred species will be listed, and 48 species occurring in Armenia are also listed in the Red Data Book of the Former Soviet Union. A total of 99 vertebrates are currently listed in the Armenian Red Data Book, of which 39 are also listed in the Red Data Book of the Former Soviet Union, and a number are considered internationally threatened, according to the IUCN Red List of Threatened Animals. However, updating the Armenian Red Data Book would be likely to lead to the inclusion of many more species, perhaps doubling the existing list. The status, distribution, and even scientific names, of many species have changed since the Armenian Red Data Book was last published. A number of species occurring in isolated populations were not included in the book. Furthermore, the recent economic crisis during the transition period and natural disasters have severely impacted many species, and existing legislation still is not effective enough in protecting and sustainable use of wildlife resources. A number of species are now thought to be on the verge of extinction in Armenia.

## **PROTECTED AREAS IN ARMENIA**

According to written sources the prototypes of protected areas in Armenia can be traced back to the late 3rd - early 2nd century BC. At least, the earliest reference to that dates back to the mentioned period of the Armenian history. An Armenian chronicler Movses Khorenatsi mentioned about that in the early 5th century AD (circa 410). Along with the description of Armenian history he provided numerous facts about nature protection. His detailed description of the nature, certain areas, mansions, settlements, fields, orchards, forests and hunting grounds is the evidence of a developed, environmentally minded culture in the ancient Armenia, as well as practical use of nature.

The last king of the Yervanduni dynasty - King Yervand (birth date unknown, circa 200 BC, according to Movses Khorenatsi reigned for 20 years) founded a number of towns and a new capital Yervandashat as well as ordered to plant a forest named "Tsnndots Forest" on the River Akhurian somewhat north of the capital.

Another historical fact is that during the reign of King Khosrov II Kotack (330- 338 AD) the "Khosrov Forest" was established in the place of the present reserve with the same name. These forests were planted for the reproduction of big game for royal hunting. However, these were expressions of careful attitude towards nature and high appreciation of nature. At the same time, these forests were the prototypes of protected areas and solid evidence of their existence in the historic Armenia.

All over the world specially protected areas are established to conserve biological diversity and the gene stock of living organisms. A network of specially protected areas was first established in Armenia in 1958 to protect ecosystems, habitats and rare, endemic and threatened species. In Armenia there are also 30 specially protected nature areas - 3 reserves, 2 national parks and 25 reservations registered, which together cover around 308.000 ha, or 10% of the surface of the country. Around 60% of Armenian species are represented within the protected area network, however there is a bias towards forest habitats, and a need to expand the system to include better representation of other

ecosystems. The 50th anniversary of the establishment of protected areas in Armenia will be celebrated in 2008.

### **Reserves**

State Reserves are established to provide high levels of protection for important habitats and species, and human use within reserves is restricted to scientific research. State Reserves therefore represent strict nature reserves, with respect to IUCN criteria. The Ministry of Nature Protection has overall responsibility for State Reserves, and manages three reserves (Erebuni, Shikahogh and Khosrov), two national parks (Dilijan, Sevan), 8 State Reservations and 17 State Reservations managed by 'Hayantar' State (under the authority of the Ministry of Agriculture).

#### **List of protected natural territories of Armenia**

<b>Name of SPNT</b>	<b>IUCN category</b>	<b>Area (ha)</b>	<b>Year of creation</b>
	<b>National</b>	<b>Parks</b>	
<b>Sevan</b>	<b>II</b>	<b>147 456</b>	<b>1978</b>
<b>Dilijan</b>	<b>II</b>	<b>33 765</b>	<b>1958</b>
	<b>State</b>	<b>reserves</b>	
<b>Khosrov Forest</b>	<b>I a</b>	<b>23 878</b>	<b>1958</b>
<b>Erebuni</b>	<b>I a</b>	<b>89</b>	<b>1981</b>
<b>Shikahogh</b>	<b>I a</b>	<b>12137.075</b>	<b>1958</b>
	<b>Reservations</b>		
<b>Akhnabat Yew Grove</b>	<b>IV</b>	<b>25</b>	<b>1959</b>
<b>Hazel-nut</b>	<b>IV</b>	<b>40</b>	<b>1958</b>
<b>Rhododendron</b>	<b>IV</b>	<b>1 000</b>	<b>1959</b>
<b>Vordan Karmir</b>	<b>IV</b>	<b>219.85</b>	<b>1987</b>
<b>Goravan Sands</b>	<b>IV</b>	<b>95.99</b>	<b>1959</b>
<b>Aragats Alpine</b>	<b>IV</b>	<b>300</b>	<b>1959</b>
<b>Arzakan- Meghradzor</b>	<b>IV</b>	<b>13 532</b>	<b>1971</b>
<b>Banks' Pine</b>	<b>IV</b>	<b>4</b>	<b>1959</b>
<b>Boghakar</b>	<b>IV</b>	<b>2 728</b>	<b>1989</b>
<b>Gangzakar</b>	<b>IV</b>	<b>6 813</b>	<b>1971</b>

<b>Getik</b>	<b>IV</b>	<b>5 728</b>	<b>1971</b>
<b>Juniper of Sevan /Forest/</b>	<b>IV</b>	<b>3 312</b>	<b>1958,</b>
<b>Goris</b>	<b>IV</b>	<b>1 850</b>	<b>1972</b>
<b>Yeghegis</b>	<b>IV</b>	<b>4 200</b>	<b>1971</b>
<b>Ijevan</b>	<b>IV</b>	<b>5 908</b>	<b>1971</b>
<b>Hankavan (hydrological)</b>	<b>IV</b>	<b>9 350</b>	<b>1981</b>
<b>Her-her Forests</b>	<b>IV</b>	<b>6 139</b>	<b>1958</b>
<b>Margahovit</b>	<b>IV</b>	<b>3 368</b>	<b>1971</b>
<b>Jermuk (forest)</b>	<b>IV</b>	<b>3 865</b>	<b>1958</b>
<b>Jermuk (hydrological)</b>	<b>IV</b>	<b>18 000</b>	<b>1981</b>
<b>Sev Lich</b>	<b>IV</b>	<b>240</b>	<b>1987</b>
<b>Pine of Gjulagarak</b>	<b>IV</b>	<b>2 576</b>	<b>1958</b>
<b>Plane grow</b>	<b>IV</b>	<b>64 2</b>	<b>1958</b>
<b>Khor Virap</b>	<b>IV</b>	<b>50 28</b>	<b>2007</b>
<b>Gilan</b>	<b>IV</b>	<b>118</b>	<b>2007</b>

Armenia acceded the Convention on the Conservation of the European Wildlife and Natural Habitats (Bern, 1979) in March 2006 /February 2008/. Armenian Parliament approved in 2006 law “On specially protected natural areas“, which provides the legal base for the development of the ecological network in the country.

#### **Framework of the pilot project**

The framework of the Pilot Project is defined by the Contract No. 00804807 33/07 as follows:

1. Set up a National Team of experts related to the development of the Emerald Network which should comprise technical, administrative and scientific persons;
2. Organize a workshop, during which the above mentioned team will be initiated to the Emerald principles and technicalities by the staff and expert of the Council of Europe. In this work the Emerald Network soft will be installed and explained together with instructions concerning the scientific background of the data collection;
3. Evaluate the results on presence of species and habitats within each bio-geographical region in the country;
4. Construct a pilot database on real sites, which will eventually become Emerald sites using the Emerald software.

#### **Legal basis for developing the network**

- Bern Convention Articles No. 1, 2, 3, 4, 6b, 9
- Resolutions No 1 (1989), 3 and 4 (1996) , 5 and 6 (1998)
- Recommendations No 17 and 16 (1989), No. 25 (1991)

#### **Main reference documents**

The main reference documents that lay down the framework of Emerald Network are:

- **Document T-PVS/Emerald** (2000) 1 rev- Building up the Emerald network: guide for Emerald network country team leaders
- **Document T-PVS/Emerald** (2001) 51 - The Emerald Network - a network of Areas of Special Conservation Interest for Europe
- **Document T-PVS/Emerald** (99) 2 - Emerald software version 1.1 User Manual (1999)

**Establishing National Team**

The National Emerald Network team in Armenia was established in November 2007.

The core group of National team consists of 7 people representing scientific, technical and administrative experts and institutions with various backgrounds. The project coordinator and administrator are representatives of the Ministry of Nature Protection, which is responsible for project implementation.

The structure of the team is as follows:

- **Hasmik Ghalachyan** - team leader - Ministry of Nature Protection
- **Karen Jenderedjian** - fauna expert - Ministry of Nature Protection
- Georgi Fayvush** - flora expert - Institute of Botany, National Academy of Sciences
- **Siranush Muradyan** - flora expert - Ministry of Nature Protection
- **Nelli Tumasyan** - technical expert - Ministry of Nature Protection -
- **Aram Agasyan** - fauna expert - Institute of Zoology, National Academy of Sciences
- **Jirayr Vardanyan** - flora expert - Institute of Botany, National Academy of Sciences

**The Emerald Network pilot project workshop**

**The technical workshop was organized in Yerevan on 1-2 November 2007.**

The Head of Bioresources management Agency Mr. Artashes Ziroyan opened the technical workshop. The importance of relations of Armenia with the international organizations, especially with such as Council of Europe and European Union was mentioned after the welcome words. In the opening speech Armenia is host to an extremely rich biodiversity. For the conservation of such biodiversity, even without considering the decisions on the ecosystem approach, in-situ conservation is the best method. Taking into account the uniqueness of the flora and fauna of the country, the large number of rare, relict and endemic species, the rich gene fund of wild relatives of crops and domestic animals, as well as the traditionally high degree of their utilization in various sectors, in-situ conservation is considered by the State as a primary guarantee of sustained conservation of the rich biodiversity of the country. Thus, it is one of the priorities of environmental policy in Armenia. Unfortunately, the current transitional condition of the economy, the economic crisis, and a lack of financial resources in the state budget are not sufficient to be able to carry out the measures necessary for in-situ conservation even to a minimal extent.

During the workshop Ms. Helene Bouguessa from the Council of Europe explained the legal framework of the Emerald Network, criteria for selection of ASCI-s and presented relevant Emerald documentation.

Mr. Marc Roekaerts, consultant for the Council of Europe explained the main features of the Emerald Network database and Standard Data Entry form and demonstrated the final version of the Emerald Network software and provided detailed explanation step-by-step on the introduction of the data into the software.

The workshop itself was working on two plenary sessions and at workshop there were representatives of Ministry of Nature Protection, National Academy of Sciences and relevant NGO.

### **National legislative framework for biodiversity conservation**

The activities of specially protected nature areas in Armenia are regulated by the above mentioned Law on Protected Areas of the Republic of Armenia, Legislative Bases for Nature Protection in the Republic of Armenia (November 27, 2006), Law on Flora (November 23, 1999), Law on Fauna (April 3, 2000), Law on Lake Sevan (May 15, 2001), The Law on Hunt and Hunting Areas (April 9, 2007), Law on Rehabilitation of Lake Sevan Ecosystem, its Maintenance, Reproduction and Utilization (December 14, 2001) as well as other laws of the Republic of Armenia and statutes of protected areas. At present, the drafting of a new law on protected areas is underway.

The law on Specially Protected Nature Areas defines the following categories of protected area at the national level:

- State Reserves
- Reservations
- National park
- Biosphere park
- Nature monuments
- Zoological park
- Botanical garden
- Dendrological park

### **Conventions and international agreements ratified by Armenia**

**International agreements.** Besides the Bern Convention, Armenia is a signatory of several Conventions directly or indirectly related to the problems of biodiversity conservation:

#### **1. Convention on Biological Diversity**

Armenia ratified the Convention on Biological Diversity on 14 May 1993. A Biodiversity Strategy and Action Plan (BSAP) and the First National Report to the Conference of the Parties to the Convention were prepared in 1999. The Government has approved a schedule of measures to implement the Convention. The BSAP will be the basis for national biodiversity policy and will be adopted by the Government. It aims at ensuring the conservation, sustainable use and regeneration of Armenia's landscape and biological diversity. It includes a budget for its implementation, identifying what can be funded in Armenia and what needs international funding, indicating possible sources of finance.

#### **2. Convention on Wetlands (Ramsar)**

Armenia became a Party to the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention) on 6 November 1993. Two sites were designated for the List of Wetlands of International Importance: Lake Sevan and its basin (489,100ha) and Lake Arpi and its bogs (3,139ha). Lake Sevan is one of the world's largest alpine lakes and it and the surrounding basin are significant resting and wintering areas for migratory waterfowl.

#### **3. Convention to Combat Desertification**

Armenia ratified the United Nations Convention to Combat Desertification on 2 July 1997. A National Action Programme addressing control of land distribution, re-cultivation of eroded land, reclamation of saline lands and restoration of their natural productivity is being prepared. Armenia has received US\$32,000 from the Convention's secretariat for this purpose. Armenia participated in a regional project with Georgia and Azerbaijan "Arid and

Semi-Arid Eco-system Conservation in the Caucasus" (see this questionnaire, question 374).

#### **4. Convention on Climate Change**

Armenia ratified the United Nations Framework Convention on Climate Change on 14 May 1993. A national implementation strategy and the first national communication were prepared in 1998 as part of the project "Armenia – Country Study on Climate Change". The communication contains a specific activity related to biodiversity, which is formulated as "An assessment of vulnerability and adaptation measures for natural ecosystems, water resources, agriculture and health issues related to climate change".

#### **5. Espoo Convention**

Armenia ratified the UNECE Convention on Environmental Impact Assessment in a Transboundary Context on 21 February 1997, making it the only country in the Trans-Caucasian region to accede to it. This restricts the application of its provisions in the region.

#### **6. The CITES**

Armenia ratified the Washington Convention on International Trade Endangered Species of wild animal and plants (CITES ) on 10 April 2008

#### **7. Convention on World Cultural and Natural Heritage**

Armenia ratified the Convention on World Cultural and Natural Heritage on 5 September 1993

- Armenia participated in the United Nations Conference on Environment and Development in Rio de Janeiro, Brazil, in 1992. There have been no specific initiatives to implement Agenda 21 in Armenia. However, a process to develop a National Environmental Action Plan was initiated in 1996 and finished in 1998. It included two chapters related to biodiversity: "Forest conservation" and "Biodiversity conservation".

- Armenia has been actively involved in the "Environment for Europe" process since the second ministerial meeting in Lucerne, Switzerland. Participation in the process fits well with Armenia's goal to move closer towards the EU, and is thus considered important. Armenia is trying to implement the decisions taken within the framework of the process. It supports the establishment of a regional environmental centre (REC) in Georgia for the Caucasian region, and an agreement on the regional REC was signed between Georgia, Armenia and Azerbaijan in the autumn of 1999. A national report in the framework of "Europe's Environment: the Second Assessment" (Dobris +3) was prepared with financial support from EU/TACIS.

- Armenia has adopted the Pan-European Biological and Landscape Diversity Strategy. Within the framework of this strategy, Armenia participates in the development of documents on global environmental networks, the clearing-house mechanism, the global taxonomic initiative, integrating biological and landscape diversity objectives into sectoral policies, as well as in the decision-making processes on the proposed documents.

- In the Framework of Pan-European Strategy of Biological and Landscape Diversity there is a Programme Element "Establishment of potential for conservation and sustainable use of biodiversity in Central and East Europe (CEE) and Newly Independent States (NIS)", which contains a separate action "Development of regional co-operation (Armenia, Russia, Georgia, Azerbaijan) aimed at better management and sustainable use of biodiversity in transboundary territories" (included in the Strategy during the conference "Biodiversity in Europe" in March, 2000). For this purpose, a regional seminar will be organised in Armenia in June, 2001 (see Article 18, questions 254-255).

- Armenia has participated in the meetings of the Black Sea Economic Co-operation Forum since 1992. Armenia is particularly interested in projects with a wide scope such as: environmental education, tourism, harmonisation of monitoring and information systems, managing mountain ecosystems, cleaner production, etc
- In 1992 Armenia signed the Agreement on Co-operation in the Field of Ecology and Nature Protection, which is being coordinated by the Interstate Ecological Council for the CIS Region. Armenia participates in all activities undertaken in the framework of this Agreement, including various working groups and sub-agreements.
- Armenia has signed the following agreements within the CIS region: (a) “Agreement on co-operation in the field of ecology and environment protection” (1992); (b) “Agreement on co-operation in the field of information exchange for ecology and environment protection” (1998); (c) “Agreement on co-operation in the field of forestry and forest industry” (1998); and (d) “Agreement on co-operation in the field of ecological monitoring” (1999).

### **Activities within National team**

After technical workshop was hold in 1-2 November some meetings of National Emerald Team have been carried out. At the first meeting experts have been familiarized with three basic documents of Emerald Network. At the second meeting expert team discussed potential territories for inclusion in <Emerald Network> and after the consultation it was accepted and each expert should include his relevant part to separate map (according species, listed in Resolution No 6 and habitats listed in Resolution No 4).

In the subsequent meeting each expert has presented the list of relevant sites in maps and after discussion expert group created separate map. Following this map in the territory of Armenia there has been allocated 4 sites, which correspond to requirements of Emerald Network.

### **Selected ASCIs**

Code	Name of ASCIs	Biogeographical region
AM 2222222	SEVAN NATIONAL PARK	Anatolian
AM 1111111	KHOSROV FOREST RESERVE	Anatolian
AM 3333333	KHOR VIRAP State Reservation	Anatolian
AM 4444444	LAKE ARPI NATIONAL PARK	Anatolian

### **SEVAN NATIONAL PARK**

**Established:** 1978

**Area:** 147,456 ha

**Location:** Gegharkunik Marz

**Purpose:** protection of fresh water reserves of the lake, fish stocks, natural and historical-architectural complexes; recreation and tourism activities

**Historical-architectural monuments:** monasteries, churches, cross-stones, ethnographic and other monuments

Sevan National Park encompasses Lake Sevan and the adjacent grounds (which used to be covered by water) up to the highway around the lake. The national park is surrounded by a buffer zone, incorporating the slopes of nearby mountain ranges (Areguni, Sevan, Gegham, Vardenis and Pambak) up to their watersheds. Consequently, the national park along with the buffer zone incorporates Gegharkunik Marz (4900 km<sup>2</sup>) with its numerous settlements and 270,000 population. The main area of the national park is occupied by one of the wonders of Armenia - Lake Sevan. This one of the highest and biggest freshwater lakes in the world is a unique reservoir of fresh water for Armenia and the Transcaucasus. The ancient "Geghama Sea" or "Gegharkunik Sea" names of the lake are associated with the name of the country, which according to the chronicler Movses Khorenatsi was named after Gegham – one of the forefather

Hayk's offspring. The territory of that country corresponds to the territory of nowadays Gegharkunik Marz. According to one of the hypotheses on the origin of Lake Sevan, it originated in the Quaternary Period in the result of volcanic activity due to accumulation of melting and glacial waters in a tectonic depression. At present, the lake is situated at the altitude of about 1900 m. The lake surface is 1250 km<sup>2</sup>, though before the 1930s it was 1416 km<sup>2</sup>. After artificial water withdrawal the level of the lake dropped by more than 19.5 m. The Shorzha barrier is an underwater dam dividing the lake into two parts - Big Sevan and Small Sevan. Big Sevan is located on the south-east from the imaginary line connecting the Capes Artanish and Noraduz, its average depth is 37.7 m. Small Sevan is on the north-west of this imaginary line, its average depth is 50.9 m. Twenty-eight large and small rivers including the Argichi, Masrik, Gavaraget, Karchaghpyur (Makenis), Vardenis, Dzknaget and others flow into the lake. Only the Hrazdan (Zangu) River flows out of the lake. A brief history of the lake will be presented below to imagine the mission and vital importance of Sevan National Park. After the establishment of Soviet rules in Armenia Lake Sevan became crucial for the development of economy and energy sector. It was decided to use the age-old water resources of the lake and to drain Big Sevan in 50 years. The disastrous project was launched in 1933. The Sevan-Hrazdan cascade including six hydro-power plants was built to generate power and irrigate agricultural lands. Before that Lake Sevan was a young oligotrophic lake with pure, transparent and ecologically "clean drinking water". Like all the other freshwater lakes in the world it was expected to age very slowly (natural process called eutrophication). However, the lake originated during the period of glacier melting, endured for centuries and came down to us as a young water reservoir. Consequently, in case of natural development it would exist for many centuries. Nevertheless, in the result of devastating plan, which certainly boosted temporarily the economic development of Armenia and Gegharkunik Marz, the lake shore-line receded leaving bare areas and white ground previously covered by water. The former Island Sevan turned into a peninsula, Lake Gilli in the

Masrik plain dried up leaving only a small peat area. Fast aging of Lake Sevan started. The increase of organic matter in the lake, namely fixed nitrogen and phosphorus compounds as results of economic activity contributed to the aging of the lake. In 1963 the eutrophication or swamping of the lake began. Water "blooming" appeared due to drastic increase of blue-green algae and bacteria leading to the change of water color and transparency. In 1975-1978 the lake was under intensive eutrophication. The risk of swamping became alarming. The Lake Sevan problem emerged as the antropogenic disturbance of the natural balance of the lake ecosystem.

Trying to address the problem in 1978 Sevan National Park was established (ArmSSR Council of Ministers Decree No. 125, March 14, 1978). Its ultimate goal was to protect the lake. National park includes the lake and surrounding areas (24,800 ha) which were under water several decades ago. As it is usually done, special zones have been designated in the national park: protection zone with a strict regime of protection, recreational zone and economic zone for economic activity. These areas in Sevan National Park do not make continuous or uninterrupted zones (though called zones) and spread all over the park territory. The reserve zone of 3700 ha consists of five reserve areas - Artanish, Vardenis, Lichk, Noraduz and Norashen as well as ten other protected areas stretching along the beds of large rivers on the length of 500 m starting from the river mouth. The recreational zone occupies 4200 ha of



coastal area. It is envisaged for recreational and health purposes. There are various facilities functioning here such as guest houses, hotels, private recreational facilities and others located around the whole shoreline concentrated more in the western part of the lake. Convenient beaches, historical-architectural and ancient ethnographic monuments as well as scenic landscapes provide good opportunities for excursions and tourism. The economic zone incorporates areas for fishery and forestry activities. Goldfish (*Carassius auratus*) is allowed. crayfish (*Astacus leptodactylus*) farming is being developed. Crayfish has become a commercial species in Lake Sevan. When referring to the economic zone it is necessary to mention economic activities being carried out in the buffer zone of the national park, which directly affect its water and terrestrial areas. The division of Gegharkunik Marz into two parts, namely up to the highway and beyond the highway is very artificial from geographic, economic and other perspectives. Hence, it should be noted that in the past before the economic crisis more than fifty large agricultural and industrial facilities (construction material production, chemical, food-processing and light industry etc.) and numerous small enterprises functioned in the big settlements. However, the treatment of their waste and wastewater was not done properly. A wastewater collector planned to be constructed around the lake has not been completed. Only large-diameter pipe sections remained around the lake.

According to the inventory (2005) the flora of national park includes 1150 species of vascular plants and its buffer zone includes 1587 species. Lake Sevan like many freshwater lakes is not very rich in plants and animals, although its fish stocks have big economic significance for the country. The homogeneity of water environment limits the diversity of living organisms. The lake flora includes algae (*Chara*, *Spirogyra*, *Zygnema*, *Euglena*, *Volvox*, *Oscillaria*, *Diatomeae* etc.) as well as other aquatic flowering plants which occupy their own niche - the littoral zone of the lake down to several meters in depth. 9 out of 14 genera and 19 out of 36 species of aquatic flowering plants common for Armenia occur in the lake. The genus *Potamogeton* L. (pondweed) is especially well represented with seven species occurring in the lake (narrowleaved *Potamogeton pectinatus* L., broad-leaved *P. natans* L., semi-transparent *P. perfoliatus* L. and others). They all grow either in water or on its surface. They bloom in small greenish flowers emerging from the water and then settle green or gray fruits. In addition, hornwort (*Ceratophyllum demersum* L.), water milfoil (*Myriophyllum verticillatum* L.), crowfoot (*Ranunculus kochii* Ledeb.), horned pondweed (*Zanichellia palustris* L.) and different species of duckweed (*Lemna* L.) occur in Lake Sevan. Heaps of aquatic plants brought by waves can be seen often on the littoral sands; they consist of the fragments of hornwort and horned pondweed in the mixture with algae, as well as beautiful reddish water milfoil looking like a small floating new-year tree. The basin of the Argichi River originating in the Vardenis mountains is the only habitat in Armenia for another aquatic plant - opposite-leaved pondweed - *Groenlandia densa* (L.) Fourr. One more rare aquatic plant trifoliolate buckbean - *Menyanthes trifoliata* L. used to occur in Lake Gilli. The terrestrial area of the national park surrounds the lake in a narrow band up to the highway. The littoral flora is of secondary origin and mainly consists of artificial stands of pine (*Pinus*), poplar (*Populus*), oleaster (*Elaeagnus*), seabuckthorn (*Hyppophae rhamnoides* L.) and other species. The grass cover consists of plants adapted to sand as well as weed species. These are blue lettuce (*Lactuca tatarica* (L.) C.A.Mey.), wormwood (*Artemisia austriaca* Jacq.), bird spiderflower (*Cleome ornithopodioides* L.) and different species of genera *Potentilla* L., *Carex* L., *Veronica* L. Duckweed occurs in small littoral ponds. In summer duckweed (especially species *Lemna minor* L.) multiplies intensively and fully covers the surface of ponds. In littoral swamp areas bladderwort (*Utricularia vulgaris* L.) with whitish flowers and flowering rush (*Butomus umbellatus* L.) with pink flowers sometimes occur. Crowfoot with yellowish nice flowers often occurs at river mouths and flowing waters. The fauna of the lake is represented by invertebrates (water fleas - *Daphnia*, cyclops - *Cyclopidae* etc.) and vertebrates including mainly fish species. Poor species composition, prevalence of endemics and presence of species adapted to the lake environment again prove that the lake is unique. Endemic species Sevan trout (ishkhan) - *Salmo ischchan* is the gem of the lake fauna. It has silvery scale and delicious reddish meat. In the lake it is represented by four ecological races - winter ishkhan, gegharkuni, summer ishkhan and bojak. The races differ from each other externally, by the shape of the head and body, color of scale and reproduction peculiarities - spawning seasons and grounds. Bojak and winter ishkhan multiply in the littoral area of the lake,

summer ishkan - in the lake and in cold rivers flowing into the lake, while gegharkuni rises upstream to lay spawns. Unfortunately, artificial decrease in water level and pollution of river mouths affected ishkan. Ishkan having economic significance due to its nutritional value and great demand appeared in danger of extinction and was registered in the Red Data Book of Armenia. Sevan beghlou (*Barbus lacerta goktschiaicus*) is also registered in the Red Data Book of Armenia. Among fish species it is worth mentioning as well Sevan koghak (*Varicorhinus capoeta sevangi*), Sevan white fish (the hybrid introduced to Lake Sevan from Lakes Ladoga and Chud in the 1920s) and goldfish (silver tsatsan) which was brought to the lake accidentally in 1983. Thanks to its adaptability the latter reproduces itself very well in the lake. The same is true for crayfish. The commercial significance of Sevan white fish became particularly evident during the economic crisis of Armenia. During economic hardship white fish was an essential food product due to its affordable price. The birds make another important and rich group of the lake fauna. According to data published in 2000 by M. Adamyan there are more than 260 species of birds (Armenian gull - *Larus armeniacus*, red shelduck - *Tadorna ferruginea*, common shelduck - *Tadorna tadorna*, mallard - *Anas platyrhynchos*, coot - *Fulica atra*, white-tail eagle - *Haliaeetus albicilla*, lapwing - *Vanellus vanellus* etc.). There was an abundance of nesting birds (scoter - *Melanitta fusca*, whiteheaded duck - *Oxyura leucocephala*, grey goose - *Anser anser*, large saw-beak duck - *Mergus merganser*, grey crane - *Grus grus lilfordi* etc.) most of which disappeared after the drainage of Lake Gilli in the 1960s. Bird habitats including Lake Sevan, river mouths and littoral swamps suffered badly from the artificial decrease of the lake level. Pelicans (*Pelecanus onocrotalus*, *P. crispus*), common flamingo (*Phoenicopterus ruber*), scoter (*Melanitta fusca*), mute and whooping swans (*Cygnus olor*, *C. cygnus*) and various species of ducks occurring at the national park territory are registered in the Red Data Book of Armenia and the Red Data Book of the USSR. Among other groups of fauna numerous species of reptiles (lizards - *Darevskia unisexualis*, *D. nairensis*, grass-snakes - *Natrix natrix*, *N. tessellata*, various species of snakes etc.), amphibians (green toad - *Bufo viridis*, frogs - *Rana ridibunda*, *R. macrocnemus* ect.) occur in the national park. Sevan Peninsula is one of the largest terrestrial areas of the national park, which was impacted by anthropogenic pressure during years and lost its original natural vegetation. It is edged with small artificial forests; patches of mountain steppe vegetation have survived only on the hill top of the former island. Artanish Peninsula is the biggest terrestrial and one of the best conserved areas of the national park. It is regarded as an exceptional monument of nature and was designated as a reserve area. Slopes of different expositions at the altitudes of 2100-2200 meters with the area of about 2500 ha are covered by unique vegetation. The southern rocky slope with caves is of particular interest. The grounds previously covered by water are now covered by artificial forests (pine, poplar, sea-buckthorn etc.). Above there are juniper stands with the dominance of juniper (*Juniper polycarpus*) as well as the mixture of rose (*Rosa*), barberry (*Berberis*), spirea (*Spiraea*), astragalus (*Astragalus*) and prickly thirt (*Acantholimon*). The meadow vegetation of the higher zone is rich in endemic species. Lake Sevan has significant spiritual and material value for Armenian nation. Lake Sevan is a national symbol and its water resources are of vital importance for the Armenian people. The ultimate goal of Sevan National Park is to protect this national wealth which is possible only by joint efforts through the reduction of water withdrawal via the River Hrazdan, raise of the lake water level and protection from wastewaters.

**List of species occurred in Sevan region (according Resolution 6)**

	plants	insects	Fish	Amphibians and reptiles	birds	mammals
1	<i>Dracocephalum austriacum</i>			<i>Mauremys caspica</i>	<i>Accipiter brevipes</i> <i>Accipiter gentilis</i> <i>Accipiter nisus</i> <i>Acrocephalus arundinaceus</i> <i>Acrocephalus</i>	<i>Myotis emarginatus</i> <i>Rhinolophus euryale</i> <i>Rhinolophus</i>

					melanopogon	mehelyi	
					Acrocephalus palustris		
					Acrocephalus schoenobaenus	Rhinolophus hipposideros	
					Acrocephalus scirpaceus		
					Actitis hypoleucos	Rhinolophus ferrumequinum	
					Aegithalos caudatus	m	
					Alauda arvensis		
					Alcedo atthis	Rhinolophus blasii	
					Alectoris chukar		
					Anas acuta	Capra aegagrus	
					Anas clypeata		
					Anas crecca		
					Anas penelope	Canis lupus	
					Anas platyrhynchos		
					Anas querquedula	Ursus arctos	
					Anas strepera		
					Anser albifrons	Lutra lutra	
					Anser anser		
					Anser erythropus		
					Anthus campestris		
					Anthus cervinus		
					Anthus pratensis		
					Anthus spinoletta		
					Anthus trivialis		
					Apus apus		
					Aquila chrysaetos		
					Aquila clanga		
					Aquila heliaca		
					Aquila pomarina		
					Ardea cinerea		
					Ardea purpurea		
					Ardeola ralloides		
					Arenaria interpres		
					Asio flammeus		
					Asio otus		
					Athene noctua		
					Aythya ferina		
					Aythya fuligula		
					Aythya marila		
					Botaurus stellaris		
					Branta ruficollis		
					Bubo bubo		
					Bucephala clangula		
					Buteo buteo		
					Buteo rufinus		
					Calandrella brachydactyla		
					Calandrella rufescens		
					Calidris alba		
					Calidris alpina		
					Calidris ferruginea		
					Calidris minuta		
					Calidris temminckii		
					Caprimulgus europaeus		
					Carduelis cannabina		

					Carduelis carduelis		
					Carduelis chloris		
					Carduelis flavirostris		
					Carduelis spinus		
					Carpodacus erythrinus		
					Certhia familiaris		
					Cettia cetti		
					Charadrius dubius		
					Charadrius hiaticula		
					Charadrius morinellus		
					Chlidonias hybridus		
					Chlidonias niger		
					Ciconia ciconia		
					Cinclus cinclus		
					Circaetus gallicus		
					Circus aeruginosus		
					Circus cyaneus		
					Circus macrourus		
					Circus pygargus		
					Coccothraustes coccothraustes		
					Columba livia		
					Columba oenas		
					Columba palumbus		
					Coracias garrulus		
					Corvus corax		
					Corvus corax		
					Coturnix coturnix		
					Crex crex		
					Cuculus canorus		
					Cygnus columbianus bewickii		
					Cygnus cygnus		
					Cygnus olor		
					Delichon urbica		
					Dendrocopos leucotos		
					Dendrocopos major		
					Dendrocopos medius		
					Dendrocopos minor		
					Dryocopus martius		
					Egretta alba		
					Egretta garzetta		
					Emberiza cia		
					Emberiza citrinella		
					Emberiza melanocephala		
					Emberiza schoeniclus		
					Eremophila alpestris		
					Erithacus rubecula		
					Falco biarmicus		
					Falco cherrug		
					Falco columbarius		
					Falco naumanni		
					Falco peregrinus		
					Falco subbuteo		

					Falco tinnunculus		
					Falco vespertinus		
					Ficedula albicollis		
					Ficedula hypoleuca		
					Ficedula parva		
					Ficedula semitorquata		
					Fringilla coelebs		
					Fringilla montifringilla		
					Fulica atra		
					Galerida cristata		
					Gallinago gallinago		
					Gallinula chloropus		
					Gavia arctica		
					Gavia stellata		
					Glareola pratincola		
					Grus grus		
					Gypaetus barbatus		
					Gyps fulvus		
					Haematopus ostralegus		
					Haliaeetus albicilla		
					Hieraaetus pennatus		
					Himantopus himantopus		
					Hippolais icterina		
					Hirundo rustica		
					Hoplopterus spinosus		
					Ixobrychus minutus		
					Jynx torquilla		
					Lanius collurio		
					Lanius excubitor		
					Lanius minor		
					Lanius senator		
					Larus cachinnans		
					Larus canus		
					Larus fuscus		
					Larus genei		
					Larus ridibundus		
					Limicola falcinellus		
					Limosa limosa		
					Locustella fluviatilis		
					Locustella luscinioides		
					Locustella naevia		
					Luscinia luscinia		
					Luscinia megarhynchos		
					Luscinia svecica		
					Lymnocyptes minimus		
					Melanitta fusca		
					Melanitta nigra		
					Melanocorypha calandra		
					Mergus albellus		
					Mergus merganser		
					Mergus serrator		
					Merops apiaster		
					Miliaria calandra		
					Milvus migrans		

					Monticola saxatilis		
					Monticola solitarius		
					Montifringilla nivalis		
					Motacilla alba		
					Motacilla cinerea		
					Motacilla flava		
					Muscicapa striata		
					Neophron percnopterus		
					Netta rufina		
					Numenius arquata		
					Numenius phaeopus		
					Nycticorax nycticorax		
					Oenanthe hispanica		
					Oenanthe isabellina		
					Oenanthe oenanthe		
					Oriolus oriolus		
					Oxyura leucocephala		
					Pandion haliaetus		
					Panurus biarmicus		
					Parus ater		
					Parus caeruleus		
					Parus cristatus		
					Parus major		
					Passer montanus		
					Passer montanus		
					Pelecanus crispus		
					Pelecanus onocrotalus		
					Perdix perdix		
					Pernis apivorus		
					Petronia petronia		
					Phalacrocorax carbo		
					Phalaropus lobatus		
					Phoenicopterus ruber		
					Phoenicurus ochruros		
					Phoenicurus phoenicurus		
					Phylloscopus collybita		
					Phylloscopus sibilatrix		
					Phylloscopus trochiloides		
					Phylloscopus trochilus		
					Picus viridis		
					Platalea leucorodia		
					Plectrophenax nivalis		
					Plegadis falcinellus		
					Podiceps auritus		
					Podiceps cristatus		
					Podiceps grisegena		
					Podiceps nigricollis		
					Porphyrio porphyrio		
					Porzana parva		
					Porzana porzana		
					Porzana pusilla		
					Prunella collaris		
					Prunella modularis		

					Prunella ocularis		
					Pterocles orientalis		
					Ptyonoprogne rupestris		
					Pyrrhonorax graculus		
					Pyrrhonorax pyrrhonorax		
					Pyrrhula pyrrhula		
					Rallus aquaticus		
					Recurvirostra avosetta		
					Regulus regulus		
					Remiz pendulinus		
					Riparia riparia		
					Saxicola rubetra		
					Saxicola torquata		
					Scolopax rusticola		
					Serinus pusillus		
					Sitta europaea		
					Sitta neumayer		
					Sitta tephronota		
					Stercorarius longicaudus		
					Stercorarius parasiticus		
					Stercorarius pomarinus		
					Sterna albifrons		
					Sterna caspia		
					Sterna hirundo		
					Streptopelia turtur		
					Strix aluco		
					Sturnus roseus		
					Sylvia atricapilla		
					Sylvia borin		
					Sylvia communis		
					Sylvia curruca		
					Sylvia nisoria		
					Tadorna ferruginea		
					Tadorna tadorna		
					Tichodroma muraria		
					Tringa erythropus		
					Tringa glareola		
					Tringa nebularia		
					Tringa ochropus		
					Tringa stagnatilis		
					Tringa totanus		
					Troglodytes troglodytes		
					Turdus iliacus		
					Turdus merula		
					Turdus philomelos		
					Turdus pilaris		
					Turdus torquatus		
					Turdus viscivorus		
					Upupa epops		
					Vanellus vanellus		

***KHOSROV FOREST RESERVE***

**Established:** 1958

**Area:** 29,000 ha

**Location:** Ararat Marz

**Purpose:** protection of the Azat River water resources, juniper and oak, arid mountain vegetation, rare animals and plants

**Historical-architectural**

**monuments:** Havuts-Tar Monastery (11-13th centuries), stone arch-bridge across the Azat River (12th century), cross-stones

According to historical sources the expression “Khosrov Forest” is associated with King Khosrov II Kotack (4th century). The chronicler Movses Khorenatsi says that during his reign afforestation was undertaken on the territory of the present-day reserve. The King established special hunting grounds for birds and animals. The age-old Khosrov Forest has come down to us and became a reserve (ArmSSR Council of Ministers Decree No. P-341, September 13, 1958).

The reserve is located on the scenic slopes of Mounts Yeranos, Dahnak, Irits and Khosrovasar, as well as the Yerakh and Urts mountain ranges, at the altitude of 900-2400 m above sea level spreading from semi-deserts to the upper limit of forest zone. Moist meadows and rocky slopes located above this limit and serving as habitat for wild goat (*Capra aegagrus*) and moufflon (*Ovis ammon gmelinii*), unfortunately, are not included in the territory of the reserve. According to M. Grigoryan's unpublished data, the flora of the reserve consists of about 1800 vascular plants, i.e. over the half of all plant species in Armenia (about 3600). The flora diversity of the reserve includes a number of species useful for mankind, such as fruit-bearing, volatile-oil-bearing, medicinal, dye plants and others. High diversity is typical for the reserve flora. The gems of the reserve are the sparse forests of tertiary relict juniper (*Juniperus*) and oak (*Quercus*). Juniper (*Juniperus polycarpus* C.Koch) is common on dry and steep southern slopes and form sparse juniper forests with characteristic grass cover. The oak forests consist of *Quercus macranthera* Fisch. et C.A.Mey. ex Hohen. occurring in sparse or sometimes large dense homogenous oak forests. Mentioned dominant species are accompanied by ash (*Fraxinus excelsior* L. and *F. rotundifolia* Mill.), mountain ash or rowan (*Sorbus aucuparia* L.), maple (*Acer*), various species of pear (*Pyrus*) and others. There are many juniper-hackberry, juniper-rowan, juniper-pear and other mixed forests. Pear in the reserve is represented by huge diversity of species and rich gene stock. There are also many bushes such as wayfaring tree (*Viburnum lantana* L.), honeysuckle (*Lonicera*), various species of rose (*Rosa*) and hawthorn (*Crataegus*), while cereals occur abundantly in the grass cover. Semi-deserts with prevailing wormwood (*Artemisia fragrans* Willd.) occupy sizable areas in the reserve spreading over the foothills and lower mountain zone. The monotonous yellowish panorama changes during spring and autumn rainfalls. In spring the landscape is entirely covered with meadow-grass (*Poa bulbosa* L.) and sedge (*Carex stenophylloides* V.I.Krecz.) as well as the abundance of ephemeral annuals. White daisy - *Tripleurospermum parviflorum* (Willd.) Pobed., yellow *Ceratocephala falcata* (L.) Pers., bright yellow flowers of various species of gagea (*Gagea*), as well as bulbous plants such as snowdrop - *Merendera trigyna* (Stev. ex Adam) Stapf, tulip - *Tulipa biflora* Pall., bluish bellevalia - *Bellevalia* and other species of different genera, violet and brownish iris - *Iris reticulata* Bieb. and *I. elegantissima* Sosn., bright red poppy (*Papaver*) and clusters of many other species cover some places in the landscape. In summer, numerous perennial plants blossom: whiteflowered creeping caper (*Capparis spinosa* L.), various hard-leaved and thorny species of sage (*Salvia*), knapweed (*Centaurea*), cousinia (*Cousinia*), mullein (*Verbascum*) and others. In autumn, wormwood blossoms everywhere with small yellowish and reddish flowers.

Wormwood semi-desert serves as winter pasture. Rocky slopes consisting of sedimentary limestone-clay and marl expand over the upper part of the semi-desert zone.

**Arid open forest:** This Mediterranean typical Balkan type of vegetation is described as the association of xerophilous short densely branched and often thorny shrubs, represented in the reserve by



almond - *Amygdalus fenzliana* (Fritsch) Lipsky, cherry - *Cerasus mahaleb* (L.) Mill. and *C. incana* (Pall.) Spach, buckthorn - *Rhamnus pallasii* Fisch. et C.A.Mey., spirea (*Spirea*), pear (*Pyrus*, especially *P. salicifolia* L.), sometimes with hackberry (*Celtis glabrata* Stev. ex Planch.), pistachio (*Pistacia mutica* Fisch. et C.A.Mey.), sumach (*Rhus coriaria* L.), ephedra (*Ephedra procera* Fisch. et C.A.Mey.) as well as species *Zygophyllum atriplicoides* Fisch. et C.A.Mey., *Atraphaxis spinosa* L. and others. Shrubs grow in patches of tree groups or individual trees and never form a full cover. They cover the rocky slopes of gorges and canyons growing around rocks, sticking out of rock cracks, overhanging from cliffs and spreading life everywhere on barren rocks and slopes.

Rocky slopes are also rich in xerophilous species: smelly thyme (*Thymus*) and ziziphora (*Ziziphora*), beautiful sage (*Salvia*), yellow-flowered species of *Helianthemum*, thorny species of genera *Cousinia* and *Eryngium*, green-yellowish *Haplophyllum villosum* ( Bieb.) G. Don, silverleaved and yellow-flowered species of tansy - *Tanacetum argyrophyllum* (C.Koch) Tzvel., *T. chiliophyllum* (Fisch et C.A.Mey. ex DC.) Sch. Bip. and others.

Some gorges in the Yerakh Mountains are entirely covered by so called tomillares (“tomillo” is Spanish for thyme). The name itself indicates that these slopes should be covered by volatile-oil-bearing representatives of the family Lamiaceae. Hedge nettle (*Stachys lavandulifolia* Vahl.), thyme (*Thymus kotschyanus* Boiss. et Hohen.), ziziphora (*Ziziphora clinopodioides* Lam.), germander (*Teucrium polium* L.) and various species of sage grow with other plants from different families. The representatives of the family Lamiaceae spread a pleasant fragrance over the gorges covered by tomillares.

There are many cushion-shaped plants in the reserve represented by different species of astragalus (*Astragalus*), prickly-thrift (*Acantholimon*) and sainfoin - *Onobrychis cornuta* (L.) Desv. A number of resiniferous species of the thorny astragalus comprise yet another xerophylous type of so called “tragacanth” vegetation. The Urts Mountains is the only place in Armenia, where the Iranian-Turanian gypsophilous species *Gypsophila aretioides* Boiss. occurs as densely branched cushion-shaped shrubs looking like dead rocks.

The fauna of the reserve is also rich. Among invertebrates beetles numbering over 1000 species are well studied. Numerous species of mollusks and fish (trout - *Salmo fario*, roach - *Rutilus rutilus*) have been registered in the water basins. Reptiles are represented by about 30 species (*Pseudopodus apodus*, *Erix jauculus*, *Coluber ravigieri*, *Vipera lebetina*, *Eumeces schneideri*, *Mauremys caspica* etc.). There are about 130 species of birds (European short-toed eagle - *Circaetus gallicus*, partridge - *Alectoris chukar*, bearded eagle - *Gyps fulvus*, Gypeatus barbatus, pigeon - *Columba livia* ect.). Mammals are represented by approximately 50 species (weasel - *Mustela nivalis*, marten - *Martes foina*, wild cat - *Felis silvestris*, wild boar - *Sus scrofa*, fox - *Vulpes vulpes*, hare - *Lepus*, wolf - *Canis lupus*, panther - **Panthera pardus saxicolor** etc.). Amongst mammals there are well-known predecessors of domesticated goat and sheep, namely wild goat (bezoar goat) – Caucasian endemic species known also as Caucasian bearded goat due to its long beard, and Armenian moufflon or Transcaucasian wild sheep. Transcaucasian brown bear (*Ursus arctos*) also occurs here. Hunting for this bear was prohibited in Armenia in 1967. Most of the aforementioned species are registered in the Red Date Book of Armenia. Khosrov Forest Reserve with such a rich diversity of semi-desert, forest, xerophilous and especially Mediterranean types of vegetation such as arid open forests, tomillares, tragacanth and others in the whole Caucasus region.

**List of species occurred in XOSROV region (according Resolution 6)**

	plants	insects	Fish	Amphibians and reptiles	birds		Mammals	
						Pernis apivorus		Myotis emarginatus
						Gypaetus barbatus		
						Gyps fulvus		

					Circaetus gallicus		
					Accipiter brevipes		
					Buteo rufinus	Rhinolophus euryale	
					Aquila pomarina		
					Aquila chrysaetos		
					Hieraaetus pennatus	Rhinolophus mehelyi	
					Falco vespertinus		
					Falco cherrug		
					Bubo bubo	Rhinolophus ferrumequinum	
					Dendrocopos medius		
					Sylvia nisoria		
					Pyrrhocorax pyrrhocorax		
					Ciconia ciconia	Capra aegagrus	
					Milvus migrans		
					Neophron percnopterus	Canis lupus	
					Aegyptius monachus		
					Circus cyaneus		
					Circus macrourus		
					Circus pygargus	Lutra lutra	
					Aquila clanga		
					Aquila heliaca		
					Falco naumanni		
					Falco columbarius		
					Falco biarmicus		
					Falco peregrinus		
					Tadorna ferruginea		
					Tringa glareola		
					Burhinus oedicephalus		
					Pterocles orientalis		
					Aegolius funereus		
					Caprimulgus europaeus		
					Coracias garrulus		
					Alcedo atthis		
					Dendrocopos syriacus		
					Melanocorypha calandra		
					Calandrella brachydactyla		
					Anthus campestris		
					Lanius collurio		
					Lanius minor		
					Luscinia svecica		
					Ficedula albicollis		
					Ficedula semitorquata		
					Ficedula parva		
					Accipiter gentilis		
					Falco subbuteo		
					Athene noctua		
					Asio otus		
					Calandrella rufescens		

					Galerida cristata	
					Alauda arvensis	
					Ptyonoprogne rupestris	
					Anthus spinoletta	
					Lanius senator	
					Erithacus rubecula	
					Phoenicurus ochruros	
					Monticola solitarius	
					Turdus torquatus	
					Turdus pilaris	
					Turdus viscivorus	
					Regulus regulus	
					Muscicapa striata	
					Parus caeruleus	
					Parus major	
					Emberiza cia	
					Emberiza melanocephala	
					Pyrrhula pyrrhula	
					Montifringilla nivalis	
					Oriolus oriolus	
					Pyrrhocorax graculus	
					Corvus corax	
					Accipiter nisus	
					Buteo buteo	
					Falco tinnunculus	
					Anas platyrhynchos	
					Anas crecca	
					Alectoris chukar	
					Perdix perdix	
					Coturnix coturnix	
					Gallinago gallinago	
					Tringa ochropus	
					Vanellus vanellus	
					Columba livia	
					Columba oenas	
					Columba palumbus	
					Streptopelia turtur	
					Cuculus canorus	
					Otus scops	
					Apus apus	
					Merops apiaster	
					Upupa epops	
					Jynx torquilla	
					Dendrocopos major	
					Eremophila alpestris	
					Riparia riparia	
					Hirundo rustica	
					Delichon urbica	
					Motacilla alba	
					Motacilla flava	
					Motacilla cinerea	
					Anthus trivialis	
					Anthus pratensis	

					Lanius excubitor		
					Cinclus cinclus		
					Troglodytes troglodytes		
					Prunella collaris		
					Prunella ocularis		
					Prunella modularis		
					Cercotrichas galactotes		
					Luscinia luscinia		
					Luscinia megarhynchos		
					Irania gutturalis		
					Phoenicurus phoenicurus		
					Saxicola rubetra		
					Saxicola torquata		
					Oenanthe oenanthe		
					Oenanthe hispanica		
					Oenanthe isabellina		
					Monticola saxatilis		
					Turdus merula		
					Turdus iliacus		
					Turdus philomelos		
					Cettia cetti		
					Locustella fluviatilis		
					Acrocephalus arundinaceus		
					Hippolais pallida		
					Phylloscopus trochilus		
					Phylloscopus collybita		
					Phylloscopus trochiloides		
					Sylvia atricapilla		
					Sylvia borin		
					Sylvia communis		
					Sylvia curruca		
					Sylvia hortensis		
					Regulus ignicapillus		
					Ficedula hypoleuca		
					Aegithalos caudatus		
					Remiz pendulinus		
					Parus ater		
					Sitta neumayer		
					Sitta tephronota		
					Tichodroma muraria		
					Certhia familiaris		
					Miliaria calandra		
					Emberiza citrinella		
					Fringilla coelebs		
					Fringilla montifringilla		
					Serinus pusillus		
					Carduelis spinus		
					Carduelis carduelis		
					Carduelis flavirostris		
					Carduelis cannabina		

						Carpodacus erythrinus	
						Passer montanus	
						Petronia petronia	
						Sturnus roseus	

## ***LAKE ARPI- NATIONAL PARK***

**Established: 2007**

**Area: 29 000 ha**

**Location: Shirak Marz**

**Purpose:** protection of the Lake Arpi, Akhuryan River water resources, the temporary resting place for migrating birds, rare animals and plants

In addition, in the framework of international cooperation it is envisaged to establish a new transboundary protected area on the border of Armenia and Georgia, which will include wetlands of both countries. The idea of including Lake Arpi and adjacent territories in the new protected area is determined by the significance of the lake for bird fauna. Being located on a major migration route Lake Arpi plays an indispensable role as a temporary resting place for migrating birds. However, Lake Arpi being registered as a wetland site for the protection under the Ramsar International Convention on Wetlands still was not designated as specially protected area in Armenia.

### **Landscape variety**

The main landscape of Arpi Lake and its neighboring territory are dead-water, marshes, rocky steps and meadows. The adjusted zone of Arpi Lake is flat, excluding South-Western bank, which is steep. There are two rocky islands 8 and 4 hectares, which are very important for water birds breeding. Due to the damp climate conditions the meadow steppes are very widespread here.

### **Biodiversity**

The Basin of Arpi Lake is famous for its flora and fauna diversity. This basin is a part of Upper Akhuryan floristic region with its typical flora: mainly mesophytes from Poaceae Phleum, Festuca, Poa, Dactylis, Stipa, Koeleria, etc., Asteraceae, Fabaceae families. 25 of the plant species and 30 of animal species are considered to be endangered, rare or almost extinct and are included in the Red list of flora and fauna of RA.

The vegetation of Arpi lake water basin is represented by meadow-steppes, sub-alpine and alpine meadows, wetlands' and petrophilous vegetation. Meadows and meadow-steppes occupy most area in the region.

There are no natural forests in this region. Small 200 ha artificial forest grow exists in the neighborhood of the lake, and consists from Populus and Pinus species.

Scripus species and some other marsh plants covered Arpi lake shore zone till 1940. There are Potamogeton pectinatus, Lemna minor, L. trisulca, Batrachium divaricatum in water of the lake and

small rivers; on the shore and in marshes around the lake species of *Carex*, *Eleocharis* and *Sparganium* are registered. There were a number of *Nymphaea alba* and *Nuphar luteum* in the lake, but because of water regime change these species extinct from this area, but in the last years *Nuphar* was found again in old Akhuryan river-bed.

Ashocq valley and its adjusted mountains are distinguished by their meadows. Here are meadows with *Bromopsis variegata*, *Dactylis glomerata*, *Hordeum violaceum*, *Koeleria cristata*, *Phleum phleoides*, *Poa longifolia* widespread.

The territory is rather poor with trees and shrubs: only 24 species *Populus tremula*, *Salix caprea*, *Rhamnus depressa*, etc..

27 species of plankton-like animals were recorded in natural conditions Rotatoria 14, Cladocera 10, Copepoda 3. But in present the number of zooplankton species has been reduced till 5 *Daphnia pulex*, *Diapanasoma brachyurum*, *Arctodiaptomus acutilobatus*, *Arctodiaptomus viridis*, *Cyclops vicinus* with 0,5g/m<sup>3</sup> of total biomass.

The main animals living on the bottom of the lake are oligochets, leeches, molluscs, freshwater hopper, aquatic ticks and mosquito larvae with total biomass 0.1g m<sup>-2</sup>.

The fauna of the lake and wetland territory consists of 8 species of fishes, 3 species of amphibians, 1 species of reptiles, 100 species of birds and about 4 species of mammals.

The ichthyofauna of the lake and its water-basin includes *Salmo trutta fario*, *Leuciscus cephalus orientalis*, *Aspius aspius taeniatus*, *Chondrostoma cyri leptosoma*, *Varicorhinus capoeta capoeta*, *Alburnoides bipunctatus armeniensis*, *Cyprinus carpio*, *Nemachilus angorae*.

The biggest fish species of the basin is *Leuciscus cephalus orientalis*, and it has 2 varieties` river and lake. *Chondrostoma cyri* is typical for the upstream and lower rich of all inflows.

The lake frog, *Rana ridibunda*, lives in the lake, *Rana macrocnemi* prefers springs.

*Natrix natrix* can be found in the surroundings of the basin.

*Phalacrocorax carbo*, *Plegadis falcinellus*, *Ciconia nigra*, *Grus grus* can be found here more frequent rather than in other places of Armenia. *Arvicola terrestris* is widespread, the quantity of *Lutra lutra* is not big, but it's stabile.

The main mammals of the steppe territories are *Lepus europaeus*, *Vulpes vulpes*, *Canis lupus*, *Meles meles*, *Martes foina*.

The water-basin of Arpi Lake is the resort for migrant predator birds, especially in September. Large quantity of *Aquila pomarina*, *Aquila heliaca*, *Aquila chrysaetus*, *Aquila nipalensis*, *Gypaetus barbatus* can be found here. Also it must be mentioned that the biggest in Armenia colony of Armenian sea-gull and the only habitat of Dalmotion Pelican are here.

From the reptiles *Vipera dorevskii* must be mentioned, this species is included in the IUCN's Red Lis. Its world known unique population is on the western slope of Javakhq mountain range on 2200-2500 m altitude.

#### List of species occurred in ARPI region (according Resolution 6)

	plants	insects	Fish	Amphibians and reptiles	birds	mammals
					<i>Pelecanus onocrotalus</i>	
					<i>Pelecanus crispus</i>	
					<i>Ixobrychus minutus</i>	<i>Myotis emarginatus</i>
					<i>Botaurus stellaris</i>	
					<i>Nycticorax nycticorax</i>	
					<i>Egretta garzetta</i>	<i>Rhinolophus euryale</i>
					<i>Egretta alba</i>	
					<i>Ardeola ralloides</i>	
					<i>Ciconia nigra</i>	<i>Rhinolophus mehelyi</i>
					<i>Ciconia ciconia</i>	
					<i>Plegadis falcinellus</i>	
					<i>Platalea leucorodia</i>	

					Pernis apivorus		
					Milvus migrans		
					Gypaetus barbatus	Rhinolophus	
					Neophron percnopterus	ferrumequinum	
					Gyps fulvus		
					Circaetus gallicus		
					Circus aeruginosus		
					Circus cyaneus	Canis lupus	
					Circus macrourus		
					Circus pygargus	Ursus arctos	
					Buteo rufinus		
					Aquila pomarina	Lutra lutra	
					Aquila clanga		
					Aquila heliaca		
					Aquila chrysaetos		
					Hieraaetus pennatus		
					Falco naumanni		
					Falco vespertinus		
					Falco columbarius		
					Falco biarmicus		
					Falco cherrug		
					Falco peregrinus		
					Anser erythropus		
					Tadorna ferruginea		
					Mergus albellus		
					Grus grus		
					Crex crex		
					Porzana parva		
					Porzana pusilla		
					Porzana porzana		
					Tringa glareola		
					Xenus cinereus		
					Phalaropus lobatus		
					Himantopus himantopus		
					Recurvirostra avosetta		
					Charadrius morinellus		
					Glareola pratincola		
					Larus genei		
					Gelochelidon nilotica		
					Sterna caspia		
					Sterna hirundo		
					Sterna albifrons		
					Chlidonias hybridus		
					Chlidonias niger		
					Bubo bubo		
					Asio flammeus		
					Caprimulgus europaeus		
					Coracias garrulus		
					Alcedo atthis		
					Melanocorypha calandra		
					Calandrella brachydactyla		
					Anthus campestris		
					Lanius collurio		
					Lanius minor		

					Luscinia svecica		
					Acrocephalus melanopogon		
					Sylvia nisoria		
					Ficedula albicollis		
					Ficedula semitorquata		
					Ficedula parva		
					Pyrrhonorax pyrrhonorax		
					Tachybaptus ruficollis		
					Podiceps grisegena		
					Podiceps cristatus		
					Podiceps nigricollis		
					Phalacrocorax carbo		
					Ardea cinerea		
					Accipiter nisus		
					Accipiter gentilis		
					Buteo buteo		
					Falco tinnunculus		
					Anser albifrons		
					Anser anser		
					Tadorna tadorna		
					Anas strepera		
					Anas penelope		
					Anas platyrhynchos		
					Anas clypeata		
					Anas acuta		
					Anas querquedula		
					Anas crecca		
					Netta rufina		
					Aythya ferina		
					Aythya fuligula		
					Aythya marila		
					Bucephala clangula		
					Mergus serrator		
					Mergus merganser		
					Perdix perdix		
					Coturnix coturnix		
					Gallinula chloropus		
					Fulica atra		
					Scolopax rusticola		
					Gallinago gallinago		
					Lymnocyptes minimus		
					Limosa limosa		
					Numenius arquata		
					Tringa erythropus		
					Tringa totanus		
					Tringa stagnatilis		
					Tringa nebularia		
					Tringa ochropus		
					Actitis hypoleucos		
					Arenaria interpres		
					Calidris minuta		
					Calidris temminckii		
					Calidris alpina		
					Calidris ferruginea		
					Limicola falcinellus		



					Haematopus ostralegus		
					Charadrius hiaticula		
					Charadrius dubius		
					Vanellus vanellus		
					Larus fuscus		
					Larus ridibundus		
					Columba livia		
					Columba oenas		
					Columba palumbus		
					Streptopelia turtur		
					Cuculus canorus		
					Athene noctua		
					Apus apus		
					Merops apiaster		
					Upupa epops		
					Jynx torquilla		
					Dendrocopos major		
					Galerida cristata		
					Alauda arvensis		
					Eremophila alpestris		
					Riparia riparia		
					Ptyonoprogne rupestris		
					Hirundo rustica		
					Delichon urbica		
					Motacilla alba		
					Motacilla flava		
					Motacilla cinerea		
					Anthus trivialis		
					Anthus pratensis		
					Anthus cervinus		
					Anthus spinoletta		
					Lanius excubitor		
					Lanius senator		
					Cinclus cinclus		
					Troglodytes troglodytes		
					Prunella collaris		
					Erithacus rubecula		
					Luscinia luscinia		
					Luscinia megarhynchos		
					Phoenicurus ochruros		
					Phoenicurus phoenicurus		
					Saxicola rubetra		
					Saxicola torquata		
					Oenanthe oenanthe		
					Oenanthe isabellina		
					Monticola saxatilis		
					Monticola solitarius		
					Turdus merula		
					Turdus pilaris		
					Turdus iliacus		
					Turdus philomelos		
					Turdus viscivorus		
					Locustella naevia		
					Locustella fluviatilis		
					Locustella luscinioides		

					Acrocephalus schoenobaenus	
					Acrocephalus scirpaceus	
					Acrocephalus palustris	
					Acrocephalus arundinaceus	
					Hippolais icterina	
					Phylloscopus trochilus	
					Phylloscopus collybita	
					Phylloscopus sibilatrix	
					Phylloscopus trochiloides	
					Sylvia atricapilla	
					Sylvia borin	
					Sylvia communis	
					Sylvia curruca	
					Regulus regulus	
					Muscicapa striata	
					Ficedula hypoleuca	
					Parus major	
					Parus caeruleus	
					Sitta neumayer	
					Miliaria calandra	
					Emberiza citrinella	
					Emberiza cia	
					Emberiza melanocephala	
					Emberiza schoeniclus	
					Plectrophenax nivalis	
					Fringilla coelebs	
					Fringilla montifringilla	
					Carduelis spinus	
					Carduelis carduelis	
					Carduelis flavirostris	
					Carduelis cannabina	
					Carpodacus erythrinus	
					Passer montanus	
					Petronia petronia	
					Montifringilla nivalis	
					Sturnus roseus	
					Oriolus oriolus	
					Pyrrhocorax graculus	
					Corvus corax	

***XOR-VIRAP- State Reservation***

**Established: 2007**

**Area: 50,28 ha.**

**Location: Ararat Marz**

**Purpose:** Purpose: protection of wetland ecosystems and typical species of plants and animals

Khor Virap state reservation was established in 25.01.2007 and is located in Ararat marz of Republic of Armenia, on the 50,28 ha wetland territory located near the Khor Virap's church complex and the right-side part of ancient capital, Artashat.

The main purpose of the reserve is the protection of wetland ecosystems, plants and animals, especially the protection of water birds, rare plant species, ecosystem's natural development, reproduction and sustainable use.

The object for special protection in the reservation are wetland ecosystems, situated near Arax river.

To limit the economic activity that has negative influence on reserve the territory with 100 m widths around the reservations is determined as support zone.

The wetland of Khor Virap has a big importance as fowls habitat and it is one of the wetlands that must be included in the list of Convention on Wetlands of International Importance Ramsar, 1971. This ecosystem has big ecological, economic, cultural, scientific and recreation value, which loss, especially as fowl habitat, will cause a big damage to biodiversity of our country.

The flora of Khor Virap reservation belongs to water-marsh type of vegetation in the semi-desert belt.

The following plants can be found here: *Alisma lanceolatum*, *Bolboschoenus maritimus*, *Carex acutiformis*, *Catabrosa aquatica*, *Cyperus longus*, *Echinochloa crus-galli*, *Eleocharis palustris*, *Glyceria plicata*, *Juncus articulatus*, *Juncus inflexus*, *Lemna polyrrhiza*, *Phragmites australis*, *Poa palustris*, *Potamogeton natans*, *Potamogeton nodosus*, *Potamogeton pectinatus*, *Ranunculus sceleratus*, *Sparganium erectum*, *Sparganium neglectum*, *Typha angustifolia*, *Typha latifolia*, *Typha laxmannii*, *Veronica anagallis-aquatica*,

## **Fauna**

### **Invertebrate**

From the water invertebrates the species from following groups can be found here: Cnidaria, Turbellaria, Nematodes, Oligochaeta, Gastropoda, Bivalvia, Ostracoda, Cladocera, Cyclopoida, Amphipoda, Hydracarina, Odonata, Ephemeroptera, Hemiptera, Chironomidae, Cuculidae. The dominant species are *Tubifex tubifex* and *Limnodrilus hoffmeisteri*, *Limnaea stagnalis* and *Anadonta piscinalis*, *Chironomus plumosus*.

### **Fishes**

In the channels, feeding the marshes of Khor Virap can be found *Silurus glanis*, *Ctenopharygodon idella*, *Mylopharyngodon piceus*, *Hypophthalmichthys molitrix*, *Cyprinus carpio*, *Rutilus rutilus*, *Abramus brama*, *Varicorhinus capoeta capoeta*, *Carassius auratus*.

### **Amphibians**

Three species of amphibians *Bufo viridis*, *Rana ridibunda*, *Hyla savignyi* can be found here. There is big quantity of the first two species, and especially of *Rana ridibunda*

### **Reptiles**

In areas surroundings wetland 16 species can be found, *Eremias strauchi*, *Eremias arguta transcaucasica*, *Ophisops elegans* are very common, *Vipera lebetina* is more rare, but also can be found here. The rare species are *Phrynocephalus helioscopus persicus* and *Testudo graeca*. *Natrix natrix*, *Natrix tessellata*, *Clemmys caspica*, and *Coluber schmidtii* can be found in the wetland.

### **Birds**

The territory has a big importance as fowl's habitat and also as an important rest place for migrating

birds.

The following species are registered here Podiceps cristatus, Podiceps nigricollis, Phalacrocorax pygmaeus, Ardea purpurea, Bubulcus ibis Ardeola ralloides, Ixobrychus minutus, Circus aeruginosus, Anas strepera, Anas crecca, Anas platyrhynchos, Anas querquedula, Marmoronetta angustirostris, Netta rufina, Aythya ferina Aythya nyroca, Aythya fuligula, Oxyura leucocephalis, Rallus aquaticus, Porzana parva, Porzana porzana, Gallinula chloropus, Fulica atra, Chettusia leucura, Vanellus vanellus, Charadrius dubius, Charadrius alexandrinus, Charadrius leschenaultia, Tringa tetanus, Tringa ochropus, Actitis hypoleucos, Gallinago gallinago, Himantopus himantopus, Recurvirostra avosetta, Chlidonias hybridus, Chlidonias leucopterus, Chlidonias niger, Sterna hirundo, Sterna albifrons, Himantopus himantopus, Recurvirostra avosetta, Alcedo atthis, Riparia riparia, Luscinia svecica occidentalis, Remiz pendulinus menzbieri, Motacilla flava, Acrocephalus scirpaceus, Acrocephalus palustris, Acrocephalus arundinaceus.

From rare and endangered species of birds Phalacrocorax carbo, Egretta alba, Platalea leucorodia, Plegadis falcinellus, Anser anser, Tadorna tadorna, Anas clypeata, Circus macrourus, Circus pygargus, Accipiter brevipes, Circaetus gallicus, Falco vespertinus, Chettusia gregaria, Haematopus ostralegus longipes, Asio flammeus, Lanius senator niloticus, Sylvia nisoria can be found here.

### Mammals

The most common species of mammals that can be found in Khor Virap marshes and channels is Arvicola terrestris. There is also a large quantity of Myocastor coypus but climate conditions play a big role in its survival, as during cold winters it can totally disappear. The species of rodents, from predators fox Vulpes vulpes, Canis aureus are typical for marshes' surroundings. From rare and endangered species Erinaceus auritus, Rhinolophus mehelyi, Barbastella leucomelas, Miniopterus schreibersi, Lutra lutra can be found here.

**List of species occurred XOR - VIRAP region (according Resolution 6)**

	plants	insects	Fish	Amphibians and reptiles	birds	mammals
1				Mauremys caspica	Egretta alba	Lutra lutra
					Ardeola ralloides	
					Milvus migrans	Rhinolophus blasii
					Circus aeruginosus	
					Circus cyaneus	
					Anser erythropus	Rhinolophus euryale
					Burhinus oedicnemus	
					Himantopus himantopus	
					Gelochelidon nilotica	Rhinolophus mehelyi
					Sterna hirundo	
					Sterna albifrons	
					Podiceps auritus	Rhinolophus ferrumequinum
					Pelecanus onocrotalus	
					Pelecanus crispus	
					Botaurus stellaris	Rhinolophus blasii
					Nycticorax nycticorax	
					Egretta garzetta	
					Ardea purpurea	Rhinolophus hipposideros
					Ciconia nigra	
					Ciconia ciconia	
			Plegadis falcinellus			
			Platalea leucorodia			
			Phoenicopterus ruber			
			Pandion haliaetus			

					Pernis apivorus	
					Milvus milvus	
					Haliaeetus albicilla	
					Gypaetus barbatus	Myotis emarginatus
					Neophron percnopterus	
					Gyps fulvus	
					Aegypius monachus	Canis lupus
					Circaetus gallicus	
					Circus macrourus	
					Circus pygargus	
					Accipiter brevipes	
					Buteo rufinus	
					Aquila pomarina	
					Aquila clanga	
					Aquila heliaca	
					Aquila chrysaetos	
					Hieraaetus pennatus	
					Falco naumanni	
					Falco vespertinus	
					Falco columbarius	
					Falco biarmicus	
					Falco cherrug	
					Falco peregrinus	
					Cygnus cygnus	
					Cygnus columbianus bewickii	
					Branta ruficollis	
					Tadorna ferruginea	
					Marmaronetta angustirostris	
					Mergus albellus	
					Oxyura leucocephala	
					Grus grus	
					Crex crex	
					Porzana parva	
					Porzana pusilla	
					Porzana porzana	
					Porphyrio porphyrio	
					Tringa glareola	
					Xenus cinereus	
					Phalaropus lobatus	
					Recurvirostra avosetta	
					Hoplopterus spinosus	
					Charadrius morinellus	
					Glareola pratincola	
					Larus melanocephalus	
					Larus genei	
					Sterna caspia	
					Chlidonias hybridus	
					Chlidonias niger	
					Pterocles alchata	
					Pterocles orientalis	
					Bubo bubo	
					Asio flammeus	
					Caprimulgus europaeus	
					Coracias garrulus	
					Alcedo atthis	

					Dendrocopos syriacus	
					Melanocorypha calandra	
					Calandrella brachydactyla	
					Anthus campestris	
					Lanius collurio	
					Lanius minor	
					Luscinia svecica	
					Oenanthe pleschanka	
					Acrocephalus melanopogon	
					Sylvia nisoria	
					Ficedula albicollis	
					Ficedula semitorquata	
					Pyrrhocorax pyrrhocorax	
					Ixobrychus minutus	
					Falco peregrinus	
					Bubulcus ibis	
					Anser anser	
					Tadorna tadorna	
					Mergus merganser	
					Limosa limosa	
					Numenius arquata	
					Tringa totanus	
					Streptopelia decaocto	
					Tachybaptus ruficollis	
					Podiceps grisegena	
					Podiceps cristatus	
					Podiceps nigricollis	
					Phalacrocorax carbo	
					Ardea cinerea	
					Accipiter nisus	
					Accipiter gentilis	
					Buteo buteo	
					Falco tinnunculus	
					Falco subbuteo	
					Cygnus olor	
					Anser albifrons	
					Anas strepera	
					Anas penelope	
					Anas platyrhynchos	
					Anas clypeata	
					Anas acuta	
					Anas querquedula	
					Anas crecca	
					Netta rufina	
					Aythya ferina	
					Aythya fuligula	
					Bucephala clangula	
					Mergus serrator	
					Alectoris chukar	
					Perdix perdix	
					Coturnix coturnix	
					Rallus aquaticus	
					Gallinula chloropus	
					Fulica atra	
					Scolopax rusticola	

					Gallinago gallinago	
					Numenius phaeopus	
					Tringa erythropus	
					Tringa stagnatilis	
					Tringa nebularia	
					Tringa ochropus	
					Actitis hypoleucos	
					Arenaria interpres	
					Calidris minuta	
					Calidris temminckii	
					Calidris alpina	
					Calidris ferruginea	
					Limicola falcinellus	
					Haematopus ostralegus	
					Charadrius hiaticula	
					Charadrius dubius	
					Charadrius asiaticus	
					Vanellus vanellus	
					Stercorarius pomarinus	
					Stercorarius parasiticus	
					Larus canus	
					Larus fuscus	
					Larus ridibundus	
					Columba livia	
					Columba oenas	
					Columba palumbus	
					Streptopelia turtur	
					Cuculus canorus	
					Otus scops	
					Athene noctua	
					Asio otus	
					Apus apus	
					Merops apiaster	
					Upupa epops	
					Jynx torquilla	
					Dendrocopos major	
					Calandrella rufescens	
					Galerida cristata	
					Alauda arvensis	
					Riparia riparia	
					Ptyonoprogne rupestris	
					Hirundo rustica	
					Hirundo daurica	
					Delichon urbica	
					Motacilla alba	
					Motacilla flava	
					Motacilla cinerea	
					Anthus trivialis	
					Anthus pratensis	
					Anthus cervinus	
					Anthus spinoletta	
					Lanius excubitor	
					Lanius senator	
					Cinclus cinclus	

					Troglodytes troglodytes	
					Cercotrichas galactotes	
					Erithacus rubecula	
					Luscinia luscinia	
					Luscinia megarhynchos	
					Irania gutturalis	
					Phoenicurus ochruros	
					Phoenicurus phoenicurus	
					Saxicola rubetra	
					Saxicola torquata	
					Oenanthe oenanthe	
					Oenanthe hispanica	
					Oenanthe isabellina	
					Monticola solitarius	
					Turdus merula	
					Turdus pilaris	
					Turdus iliacus	
					Turdus philomelos	
					Turdus viscivorus	
					Panurus biarmicus	
					Cettia cetti	
					Locustella naevia	
					Locustella fluviatilis	
					Locustella luscinioides	
					Acrocephalus schoenobaenus	
					Acrocephalus scirpaceus	
					Acrocephalus palustris	
					Acrocephalus arundinaceus	
					Hippolais pallida	
					Hippolais icterina	
					Phylloscopus trochilus	
					Phylloscopus collybita	
					Phylloscopus sibilatrix	
					Phylloscopus trochiloides	
					Sylvia atricapilla	
					Sylvia borin	
					Sylvia communis	
					Sylvia curruca	
					Sylvia hortensis	
					Regulus regulus	
					Muscicapa striata	
					Ficedula hypoleuca	
					Aegithalos caudatus	
					Remiz pendulinus	
					Parus major	
					Parus caeruleus	
					Sitta tephronota	
					Certhia familiaris	
					Miliaria calandra	
					Emberiza citrinella	
					Emberiza cia	
					Emberiza melanocephala	
					Emberiza schoeniclus	
					Fringilla coelebs	
					Fringilla montifringilla	



					Serinus pusillus	
					Carduelis chloris	
					Carduelis spinus	
					Carduelis carduelis	
					Carduelis flavirostris	
					Carduelis cannabina	
					Carpodacus erythrinus	
					Passer hispaniolensis	
					Passer montanus	
					Sturnus roseus	
					Oriolus oriolus	
					Pyrrhocorax graculus	
					Corvus corax	

The national identified habitats listed in Resolution N 4 (1996) occurring within Armenia. In total 30 types of endangered natural habitats were identified.

- 15.1 Annual salt pioneer swards
- 15.9 Mediterranean gypsum scrubs
- 15. A Continental salt steppes and saltmarshes
- 22.1 Permanent ponds and lakes
- 22.11 Lime-deficient oligotrophic waterbodies
- 22.31 Euro-Siberian perennial amphibious communities
- 22.321 Dwarf spike-rush communities
- 22. 3223 Wet ground dwarf herb communities
- 22.414 Bladderwort colonies
- 22.432 Shallow-water floating communities
- 22.4321 Water crowfoot communities
- 24.2 River gravel banks
- 34.3 Dense perennial grasslands and middle European steppes
- 34.9 Continental steppes
- 41. Broad- leaved deciduous forests
- 41. Beech forests
- 41. Oak –hornbeam forests
- 42.A Western Palaearctic cypress, juniper and yew forests
- 44. 6 Mediterraneo – Turanian riverine forests
- 44. 69 Irano-Anatolian mixed riverine forests
- 44.7 Oriental plane and sweet gum woods
- 5 . Bogs and marshes
- 54. Fens, Transition Mires and Springs
- 54.1 Springs
- 54.12 Hard water springs
- 61. Scree
- 64. Inland Sand
- 65. Caves
- 91. Parklands
- 93. Wooded steppe

### Biogeographical zones on in Armenia

According to the map of biogeographical regions adopted by the Standing Committee to the Bern Convention in December 1997 one region were identified in Armenia (Anatolian ).

## DEVELOPMENT PERSPECTIVES OF SPECIALLY PROTECTED NATURE AREAS IN ARMENIA

Specially protected areas of Armenia being mainly of forest protection significance and embracing about the half of the biodiversity of Armenia can not protect the whole diversity of flora and fauna in the country. At the same time, taking into account the trends towards economic development in the country it is essential to designate new protected areas. In addition, taking into consideration the inexpediency of having big protected areas in small countries like Armenia as well as the background of protected areas in Armenia and international experience it is necessary to follow the principle of establishment of small protected areas. The Ministry of Nature Protection of the Republic of Armenia developed the “National Strategy and Action Plan on the Development of Specially Protected Areas in the Republic of Armenia ” approved by the Government of the Republic of Armenia on December 26, 2002 by Protocol Decree No. 54.

The national action plan envisages activities needed for the improvement of the legislative framework, management system and financial-economic mechanisms, human resource development and establishment of new protected areas. It proposes also to establish internationally accepted categories of protected areas such as biosphere reserve and natural park, which are new for Armenia and have not been yet set forth in the legislation of Armenia. The national action plan is drafted for 2003-2010.