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CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

GROUP OF SPECIALISTS -EUROPEAN DIPLOMA OF PROTECTED AREAS
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ROOM 14, PALAIS DE L'EUROPE

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APPLICATION PRESENTED BY THE MINISTRY OF NATURE PROTECTION OF THE REPUBLIC OF ARMENIA

"KHOSROV FOREST" STATE RESERVE

Document prepared by
the Directorate of Culture and Cultural and Natural Heritage

Council of Europe

European Diploma Area

Information Form for candidate Sites

Site Code (to be given by Council of Europe)	B	E						

1. SITE IDENTIFICATION

1.1. SITE NAME

"Khosrov Forest" State Reserve

1.2. COUNTRY	Republic of Armenia							
1.3. DATE CANDIDATURE	2	0	1	1				
1.4. SITE INFORMATION COMPILATION DATE	2	0	1	1	1	1	2	5
	Y	Y	Y	Y	M	M	D	D

1.5. ADRESSES: Administrative Authorities

National Authority	**Regional Authority**	**Local Authority**
Name: "Environmental Project Implementation Unit" State Agency under the Ministry of Nature Protection of RA Address: 129 Armenakyan str., Yerevan, 0047 Republic of Armenia Tel.: +374 10 65 16 31 Fax.: +374 10 65 00 89 e-mail: info@cep.am	Name: Address: Tel.: Fax.: e-mail:	Name: Address: Tel.: Fax.: e-mail:

1.6. ADRESSES: Site Authorities

Site Manager	Site Information Centre	Council of Europe Contact
Name: "Khosrov Forest" State Reserve Director Vorontsov Barseghyan Address: Kasyan 79 city Vedi, 0601 Republic of Armenia Tel.:(+374 234)2- 32- 47 (+374 234) 2- 13 -52 e-mail: khosrov@mail.am	Name: "Khosrov Forest" State Reserve Adress: : Kasyan 79 city Vedi, 0601 Republic of Armenia Tel.: (+374 99)00-60-30 e-mail: khosrov@mail.am	Name: "Environmental Project Implementation Unit" State Agency -director (Mr. Viktor Martirosyan) Address: 129 Armenakyan str., Yerevan, 0047 Republic of Armenia Tel.: +374 10 65 16 31 Fax.: +374 10 65 00 89 e-mail: info@cep.am Name: "Environmental Project Implementation Unit" State Agency –advisor to the director (Ms. Jemma Mirzoyan) Address: 129 Armenakyan str., Yerevan, 0047 Republic of Armenia Tel.: +374 10 65 16 31 +374 91 94 33 74 (mobile) Fax.: +374 10 65 00 89 e-mail: jemmamirzoyan@gmail.com

"Khosrov Forest" state reserve is one the oldest protected areas in the world having a history of about 1700 years. The reserve preserves ancient cultural amenities, historical-architectural monuments, unique plant and animal species, splendid diversity of scenic landscapes.

It was founded in 334-338 by the order of Armenian King Khosrov Kotak to improve the natural-climatic conditions of adjacent territories of Artashat city -the capital of Armenia of the given period and the newly established Dvin city to ensure conservation and enrichment of flora and fauna species; serve as a ground for royal hunting, military exercises and entertainments. Later the forest was enriched with hunting animals brought in from other places, especially from Persia.

In accordance with the evidence of Armenian historian Pavstos Byuzand, two fenced forests, called "Tachar Mayri (Sacred Forest)" and "Khosrovakert", were established on both banks of Azat river. "Tachar Mayri" forest started from Garni Temple and stretched to Dvin city. "Khosrovakert" was established in between Artashat and Dvin cities along the reeds. During many centauries "Khosrovakert" forest disappeared. The remained "Temple Mayri" was later merged with the natural forest.

In the historical past, the present territory of the reserve was included in Ayrarat State of Mets Hayk Kingdom. During all historical times this state was the political, economic and cultural center of Armenia. The Silk Road passed through the reserve territory. Majority of Armenian capitals were located in Ayrarat State: Armavir, Yervandashat, Artashat, Vagharshapat, Dvin, Kars, Ani. One of the oldest cities of the world Erebuni-Yerevan, the present capital of Armenia was established in Ayrarat in 782 B.C. in Ayrarat State. The center of the Armenian Apostolic Church, the Mother See of Holy Echmiadzin, is also situated here.

People perpetuate the name of Khosrov King not only giving his name to the forest, but also to Khosrov settlement, Khosrov River and Khosrovasar Mountain.

Recent History

In September of 1958 the Government of Armenia adopted a decision to declare Khosrov forest as reserve zones. It was created to conserve and improve the unique flora and fauna.
"Khosrov Forest" State Reserve SNCO currently manages "Goravan Sands" established in 1959 and "Gillan" and "Khor Virap" sanctuaries established in 2007.Khosrov forest is the evidence of the Armenian people's caring attitude towards historical monuments. Thanks to their attitude, the virgin forest located near the current capital of Armenia-Yerevan has been preserved for 17 centuries.

1. Summary description

The landscape variety of "Khosrov Forest" state reserve is due to the difficult mountainous relief, steep zoning and peculiarities of soil-climate conditions. They form landscape types from semi-desert to mountainous and alpine meadows.

Semi-desert types of landscapes are spread at 900 to 1250 m above sea level at the foot of the mountain ranges. Dry steppes occupy the middle sections of mountainous zone (at 1,250 to 2,500 m above sea level), where one can meet / find eastern oak forests from 1600 m, and Juniper sparse forests at 1,500 to 2,100 m. above the sea level.One can also meet Euonymus europaeus L., Sorbus aucuparia L., Lonicera caucasica in separate islets or with mixed symbioses.

More than 16% of the reserve area is covered with / by forests, and about 20% of the area is covered with / by lawns, bushes / shrubs, brushwood / thickets and sparse forests. 64% of the area is covered by different types of symbiosis of high - mountainous zone. Mountain-steppe and mountain-meadow landscapes are spread at 2,500 m

above sea level in the reserve area; they are transferred into sub-alpian and alpian meadows in the high mountain zone.

Landscape varieties are also due to the changes of relief forms, slope positions, declivities, mountain rock composition and microclimate conditions. This leads to the variety of flora and fauna species comparatively in small areas.

The reserve area is rich in unique natural ecosystems that are mainly due to inaccessibility and absence of paths and roads. They are mostly steep slopes, river valleys cut by deep ravines and river upper basins.
The inter-zonal water – swampy ecosystem that exist along the river banks, as well as in the neighborhood of lakes represent great interest in that sense.

2. European interst justifying the candidature

Bern – Convention on the Conservation of European Wildlife and Natural Habitats
Washington – Convention on International Trade of Endangered Species of wild Fauna and Flora (CITES)
Convention on World Cultural and Natural Heritage
IUCN – Red List of Threatened Animals
Council directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora
Council directive 79/409/EEC of 2 April 1979 on the conservation of wild birds
Bonn – Convention on the migratory species of wild animals
WWF Armenian office
Red Data Books of Plants and Animals of RA
RA law on “Specially Protected Areas”

3. Selection methodology:

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 purpose of “Khosrov Forest” State Reserve is the following: protection of the Azat River water resources, juniper and oak, arid mountain vegetation, rare animals and plants.

See below some examples of the species met and preserved in “Khosrov Forest” State Reserve:

Panthera pardus

This is one of the strictly rare species of fauna in Armenia. It is praised in Armenian poetry, fairy tales and songs. This big cat could be seen all over Armenia only 100 years ago but today it is under the threat of disappearance. Special experiments coordinated by WWF showed that about 35-40 animals still live in the Zangezour and Meghri mountain ranges in Armenia and Nakhijevan, in the Talish Mountains of Azerbaijan and Northern Iran. 3-5 of those leopards live in Southern Armenia, in Syunik marz. This animal prefers juniper open forests and rocky and stony places in oak forests. The species is included in the Armenian Red Data Book of Animals (“Critically Endangered” – CR).

Capra aegagrus

Capra aegagrus is rather common species in Armenia. It can be found at all the altitudes from Nyuvadi (500 meters above the sea level) to the top of Kaputdjugh mountain (3900 meters above the sea level), from the valley of Azat river to Meghri region in the South of Armenia. The largest populations are now presented in the Zangezur mountain ridge and Vayots Dzor marz. They live in strongly crossed rocky sites of mountains and juniper open forests. In Syunik Capra aegagrus was seen in oak forests during the last years. The species is included in the Armenian Red Data Book of Animals ("Vulnerable" – VU).

Ovis gmelini

This is a quite rare species in Armenia. It can be found at the territory of "Khosrov forest" state reserve, also in Ararat, Vayots Dzor and Syunik marzes and in the Zangezour, Bargushat and Meghri mountain chains. It is quite common at slopes and tablelands, starting from 800-3900 meters above the sea level. A drastic decrease in population has been noticed during the last years as a result of braconnier and habitat reduction. It is assessed as "Critically Endangered" (CR) in the Armenian Red Data Book of Animals.

Aegypius monachus

Cinereous vulture or Eurasian black vulture, feeds on carrion and nests in juniper trees. Distance between nests can be as little as 200-300 m, but in some clusters, pairs are more than three kilometers apart. Distance between nests within colonies can vary, and may be determined by the availability of suitable nest trees. Where population declines have been noted, these are linked to indirect persecution (for example, poisoning of forests against insects) and alteration of nesting habitat. It is included in IUCN Red List under «Near Threatened» category. It is assessed as "Endangered" (EN) in the Armenian Red Data Book of Animals.

Neophron percnopterus

It is a migrating species that nests in Armenia. It inhabits all mountain belts, except the alpine habitats. The number of population has been decreased during the last years. It is included in IUCN Red List under «Near Threatened» category. It is assessed as "Endangered" (EN) in the Armenian Red Data Book of Animals.

Buteo rufinus

It is a common nesting species in Armenia. It nests all over the republic except in the alpine habitats.

4. Main aim or motivation:

DATINGS (to be filled in by Council of Europe):

DATE OF FIRST EXAMINATION: DATE EXPERT VISIT

Y	Y	Y	Y	M	M	D	D

Y	Y	Y	Y	M	M	D	D

DATE OF SECOND EXAMINATION : DATE AWARD

Y	Y	Y	Y	M	M	D	D

Y	Y	Y	Y	M	M	D	D

2. SITE LOCATION

2.1. SITE CENTRE LOCATION:

LONGITUDE LATITUDE

		4	4	°	3	7	‘	2	0	“	N	3	9	°	5	5	‘	4	5	“

W/E (Greenwich) and and

		4	5	°	0	3	‘	2	8	“	N	4	0	°	0	8	‘	5	0	“

2.2. AREA (ha): **2.3. SITE LENGTH(Km):**

Total Area:	2	3	2	1	3	,	5	0

N 1	2	7	,	0	0	
N 2	2	1	,	0	0	

CORE								
BUFFER								
TRANSITION								

N1 from North-West to South-East
N2 from West to East

2.4. ALTITUDE (m):

MINIMUM MAXIMUM MEAN

	9	0	0

3	2	0	0

2	0	5	0

2.5. ADMINISTRATIVE REGION:

REGION NAME	%COVER
Ararat Province (Marz) in the south-western Armenia	100

Marine area not covered by the terrestrial part	

3. Natural Heritage

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 900-3200 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 (Ovisammon gmelinii), unfortunately, are not included in the territory of the reserve.

The larger part of the territory is located on the slope of 30˚. Semi-desert types of landscapes are spread at 900 to 1250 m above sea level at the foot of the mountain ranges. Dry steppes occupy the middle sections of mountainous zone (at 1,250 to 2,500 m above sea level), where one can meet / find eastern oak forests from 1600 m, and Juniper sparse forests at 1,500 to 2,100 m above the sea level.One can also meet Euonymus europaeus L., Sorbus aucuparia L. ,Lonicera caucasica in separate islets or with mixed symbioses.

More than 16% of the reserve area is covered with / by forests, and about 20% of the area is covered with / by lawns, bushes / shrubs, brushwood / thickets and sparse forests.64% of the area is covered by different types of symbiosis of high - mountainous zone.Mountain-steppe and mountain-meadow landscapes are spread at 2,500 m above sea level in the reserve area; they are transferred into sub-alpian and alpian meadows in the high mountain zone. Landscape varieties are also due to the changes of relief forms, slope positions, declivities, mountain rock composition and microclimate conditions. This leads to the variety of flora and fauna species comparatively in small areas.

The reserve area is rich in unique natural ecosystems that are mainly due to inaccessibility and absence of paths and roads. They are mostly steep slopes, river valleys cut by deep ravines and river upper basins.The inter-zonal water – swampy ecosystem that exist along the river banks, as well as in the neighborhood of lakes represent great interest in that sense.

The fluvial network is comprised of Azat and Vedi rivers, as well as their numerous tributaries, which start from the southwestern slopes of the Geghama Mountains and flow to the southwest.Azat river is formed from the confluence of Goght and Yotnakunk mountainous creeks. The river length is 40 km., the fall is 1357 m, and watershed basin surface is 572 km2. It is deep with relatively equal flow. It is full-flowing mainly in April and May and has a snow- rainy and underground mixed source.Certain riverside parts of the river are sometimes frozen in winter.There are numerous beautiful little waterfalls on the tributaries of Azat river.

Vedi river starts from 2720 m height. The river length is 58 km, the decline is 1910 m, and watershed basin surface is 633 km2. The river flow has typical seasonal features, mostly with mixed sources. It is full-flowing in April and May.The right tributaries of Vedi River are Khosrov, Hakhs and Mankuk rivers.There is a large number of freshwater and mineral springs / sources, that are specified due to their regulated / stable regime, in the reserve. There are natural couple lakes (natural lakes of Jghin) surrounded by canes at the foot of Khachi mountain in Mankuk river valley. One small lake is in Gyolaysor settlement.Waterlogged / swampy areas are rare in the reserve.

3.1 Geomorphology

The forest surface area of the reserve is 4131 ha, including: oak - 2293 ha (55.5 %), juniper - 815 ha (19.7 %), maple - 473 ha (11.5 %), willow - 208 ha (5 %), ash - 196 ha (4.7%), others (poplar, walnut, pear, apricot trees etc...) - total 3.6%

1,2 % of the forest surface area is located on the slopes at an altitude of 1200 metres above sea level , 7.1%- at an altitude that ranges from 1201 to 1500 meters above sea level, 18.4%- at an altitude that ranges from 1501 to 1700 meters above sea level, 28.4% - at an altitude that ranges from 1701 to 2000 meters above sea level and 44.5% - at an altitude that ranges higher than 2000 metres above sea level.

The gems of the reserve are the sparse forests of tertiary relict juniper (Juniperus L.) and oak (Quercus L.). Juniper (Juniperus polycarpos C.Koch) is common on dry and steep southern slopes and form sparse juniper forests with characteristic grass cover. The oak forests consist of Q. 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 L.), various species of pear (Pyrus L.) and others. There are many juniper-hackberry,juniper-rowan, juniper-pear and other mixed forests. Pear in the reserve isrepresented by huge diversity of species and rich gene stock. There are alsomany bushes such as wayfaring tree (Viburnum lantana L.), honeysuckle (Lonicera L.), various species of rose (Rosa L.) and hawthorn (Crataegus L.),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 (Poabulbosa L.) and sedge (Carex stenophylloides V.I.Krecz.) as well as the abundance of ephemeral annuals. White daisy - Tripleurospermum parviflorum (Willd.) Pobed., yellow Ceratocephalus falcatus (L.) Pers., bright yellow flowers of various species of gagea (Gagea Salisb.), as well as bulbous plants such as snowdrop - Merendera trigyna (Stev. ex Adam) Stapf, tulip – Tulipa biflora Pall., bluish bellevalia - Bellevalia Lapeyr and other species of different genera, violet and brownish iris - Iris reticulata Bieb. and I. elegantissima Sosn., bright red poppy (Papaver L.) 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 L.), knapweed (Centaurea L.), cousinia (Cousinia Cass.), mullein (Verbascum L.) and others. In autumn, wormwood blossoms everywhere with small yellowish and reddish flowers.

Most of the brown soils in the wavy landscape of the semi-desert zone, sometimes as high as high-laying rocks and screes have been cultivated and turned into vineyards, orchards and fields of cereals. 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. These eroded bare slopes called “skeletal rocks” are the habitat for xerophilous Mediterranean flora - another gem of the reserve.

Frigana (“dried out” in Greek) with its different varieties occurs on the southern dry and cracked rocky slopes. 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 L.), pear (Pyrus L. 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.

3.2. Habitats

Rocky slopes are also rich in xerophilous species: smelly thyme (Thymus L.) and ziziphora (Ziziphora L.), beautiful sage (Salvia L.), yellow-flowered species of Helianthemum Mill., thorny species of genera Cousinia Cass. and Eryngium L., 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 frangrance over the gorges covered by tomillares.

See Annex (Tables 1-5)
Table 1. Distribution of forested areas (ha) by forest species and altitude above sea level
Table 2. Distribution of forested areas by steepness of the slopes (area, ha)
Table 3. Distribution of forested areas by exposition
Table 4. Distribution of forested areas by growth class (bonitet)
Table 5. Distribution of forested areas by dominating species and crown coverage

3.3. Flora

The reserve is distinguished with its plant species, including abundance of rare and endangered species that are due to soil climate conditions and relief diversity of the area.1849 species of vascular plants grow in the reserve area; they are represented in 588 genera and consist of 107 families. More than 80 species are involved in the Red Data Book of Armenia, and 24 species are endemic.A rich botanical collection one can find in the museum of the reserve that was collected and are maintained over many years.

Khosrov's pear tree attracts special attention here; one can find it only in the canyon / gorge of Khosrov. One can find the following families widespread in the reserve: Asteraceal 280 species, Poaceal 174, Fabaceal 154, Lamiaceal 102, Brassicaceal 99, Caryophyllaceal 97, Rosaceal 92, Apiaceal 74, Scrophulariaceal 74, Boraginaceal 57, Liliaceal 57, Chenopodiaceal 50, Ranunculaceal43, Rubiaceal 30, Cyperaceal 27, Orobanchaceal 27.The flora species spread in the reserve are divided into: tree-68, bush / shrub-90, small bush /shrub - 50, semi-bush / shrub-50, small semi-shrub / bush-25, liana -2.Vegetation composition / structure changes mainly due to the altitude above sea level.Semi-desert symbioses with Artemisia fragrans, as well as various halo-gypsophilous symbioses, where dominate different species of Salsola (Salsola ericoides, Salsola dendroides), occupy foothill and low mountain zones.

Small areas of ephemeral - halanthium semi-deserts are dominated by Halanthium rarifolium, and the rocky loamy slopes are dominated by Artemisia fragrans. In spring one can find a number of ephemerals: Merendera trigyna, Tulipa biflora, Ornithogalum, Gagea, Iris elegantissima, Ixiolirion montanum and so on.There are semi-desert plants in large areas, where fragrans are accompanied by Capparis spinosa, Acantholimon, Astragalus, Thymus kotschyanus. Phriganic groupings have been formed on very rocky, often

with small ruins not high hills. The groupings are represented with Rhamnus pallasii, Amygdalus fenzlianus, Cerasus incana, Cerasus mahaleb, Ephedra procera, Celtis glabrata, Berberis, Spiraea hypericifolia, Pistacia mutica. Very interesting phriganic symbioses are represented on the southern macro-slope of thyme range where Gypsophila aretioides dominate.

Mountain(ous) steppes, arid sparse forests and oak forests are represented in the middle mountain zone (1400-2200 m above sea level). Juniper sparse forests occupy not big areas where Juniperus polycarpos dominate. Usually Juniper is accompanied by Acer ibericum , Celtis glabrata, Amygdalus fenzliana, Rhamnus pallasii, Lonicera iberica, Viburnum lantana etc. Pear and rowan trees are represented in abundance on separate sectors. Amygdalus febzliana and Pistacia mutica sparse forests occupy not big areas.Quercus macranthera forests can be found at an altitude of 1600-2300 meters above sea level.The mountain steppes occupy considerable spaces in the reserve, where Stipa stenophylla, Stipa capillata, Stipa pulcherrima, Stipa pontica dominate. Grassland steppes are represented in relatively not big areas where Nepeta,Trifolium, Medicago, Astragalus and other species dominate. Astragalus microcephalus, Astragalus lagurus, Onobrychis cornuta, Prangos ferulavea, Acantholimon and cereals dominate in tragacanthic steppe.

There are more than 1500 Invertebrate and 283 vertebrate species in Khosrov reserve.

Invertebrate fauna:

It is presented with 62 species of mollusks / malacoids, 3 species of scorpions and 1427 species of insects. The insect fauna in the semi-desert zone is various and relatively rich with endemic species (Coleoptera: Elateridae, Cardiophorus araxicola, C. nigratissimas, Pasacardiophorus permodicus; Lepidoptera: Pieridae, Colias chlorocoma: Nymphalidae, Melithea vedica, etc.).The insect fauna in the mountain steppe zone arrests one's attention with its diversity, and one can mainly find widespread species here. Various dragon-fly and midge (Simuliidae) species can be found in the water ecosystem of this landscape.The insect fauna of forest landscapes mainly includes wood-loving insects, insects that love to live in bird's nests and wood.The insect species in Juniper sparse forests are various that include the components of sparse forest and semi-desert and consist of species of 5 categories. A number of species that belong to armored scale (coleoptera), dipterous (diptera), scale-winged (lepidoptera) insects' classes are accepted as rare and endemic species.

Riverside area is inhabited by species of 8 categories. Coleoptera, diptera, homoptera and hymenoptera are accepted as relatively rare species. Sandy riverside areas are rich with rare and endemic species, as well as with species that are widespread only in the reserve.

The meadow landscapes are inhabited not densely, mostly by coleoptera, hymenoptera, lepidoptera species, the rare species of which are: Bombus persieus, B. daghestanieus, (Apidae), Colias thisoa, C. aurorina (Pieridae).

Meadow steppes are spread at an altitude of 2200-2600 m above sea level where you can find Phleum pretense, Helictotrichon, Hordeum bulbosum and so on.
Tugai (desert, river valley) vegetation is distributed along the river banks where the following species grow: Fraxinus oxycarpa, Populus, Populus tremula, Salix, Elaeagnus angustifolia, Tamarix, as well as Berberis, Crataegus, Rosa.

Inter zonal water- swamp vegetation exists in the reserve.Hippuris vulgaris, Potamogeton and other species grow in Phragmites australis brushwood.

Very rare species (Inula aucherana; Adiantum capillus-veneris) can be found on travertines.
72.9% of the forest surface area is located at an altitude of 1501-2000 meters above sea level. The main tree species of the forest are: oak, juniper, maple, willow, ash and poplar.

3.4. Fauna

Scorpions

Black or fattail scorpions are rare species, and one can find them only in Ararat valley till the altitude of 1,000 m above sea level. Yellow and multicolour scorpions go up till the altitude of 1500-2200 m above sea level and prefer light and well conditioned soil.

Mollusks / Malacoids

They are presented by land and fresh-water species and are spread in the main habitats of the reserve (rocky lands, rock holes, grass cover and water areas). The river crab is common in the Reserve Rivers.

Vertebrate fauna Mammals

3 species of Insectivora , 7 species of Chiroptera , 1 species of Lagomorpha, 15 species of Rodentia , 12 species of Carnivora and 3 species of Artiodactyla occur in the fauna of the reserve.

The precipitous steep slopes and wet lawns with high grasses are considered as shelters and hunting grounds for brown bear, wild swine (Sus scrofa), wolf (Canis lupus), fox (Vulpes vulpes), badger (Meles meles), European hare (Lepus europaeus).Crocidura gueldenstaedti, Meles meles, Martes foina and common hedgehog occur in the forests and open arid slopes. Hystrix indica can be found in Kakavaberd and Garni areas / districts.Felis lynx occurs rare and Pantera pardus less rare on the forest top border. Stony, rocky, steep slopes of the reserve are habitats for Capra aegagrus. It should be noted that the main habitat of Capra aegagrus is out of the reserve boundaries. Ovis orientalis occur in the meadows of thyme range sub-alpine zone.

Reptiles

There are 33 species of reptile in the reserve.

Laudakia caucasia, some species of Darevski family lizard (Darevskia raddei ; Darevskia nairensis) can often be found in kserophil rocky biotopes of foothill and mountain zone.

Ophisops elegans and Lacerta strigata occur in the semi-desert zone. Lacerta media is spread in the mountain steppe zone and Pseudopus apodus occur in dry steppes, brushwoods, sparse forests. Eremias pleskei and Eremias strauchi can be found in the fragran semi-desert rocky or clay plots / areas and brushwoods of sparse juniper forests of the reserve. Ablepharus bivittatus occur in the reserve rocky slopes covered with gases and other xerophytes. Anguis fragilis, Trachylepis septemtaeniata, Eumeces schneideri can be found in the broadleaf and mixed forests, forest borders and lawns.

There are the following snake species in the reserve: Typhlops vermicularis, Eirenis collaris, Eirenis punctatolineatus, Hidrophis schmidti, Vipera / Montivipera / raddri and Eryx jaculus.

Natrix natrix and Natrix tesselata are not rare in water-swamp and river bank areas.

Coluber ravergieri, Columber nummifer , Elaphe sauromates, Vipera eriwanensis, Macrovipera / Vibera / lebetina occur in the mountain steppe zone (on the rocky slopes). Telescopus fallax and Elaphe hohenackeri can rarely be found in wet lands / areas, forest borders, river valleys, and Rhynchocalamus melanocephalus satunini occur rarely in rocky areas with semi-desert vegetation.

Amphibias

There are 5 amphibian species in the territory of the reserve. Rana ridibunda and Bufo viridis are rather often found and widely spread species in water –swamp ecosystems. It is common to see Rana macrocnemis in some streamlets flowing in the high mountain zone. Hyla savignyi occur relatively rarely.

One can find swamp tortoise and Caspian turtle in the territory.

Testudo graeca is one of the species registered in the International Red Data Book. It can be found in the semi-desert zone, mountainous xerophyte forests, sparse juniper forests and rocky / stony slopes of mountain steppes.

Fish

The reserve is distinguished with abundant fluvial network. The main rivers are Azat, Khosrov and Vedi rivers and their numerous tributaries. There are 9 fish species that can be found in the rivers of the reserve: Salmo trutta fario, Capoeta capoeta, Barbus lacerta cyri, Alburnus filippi, Alburnus alburnus hohenackeri, Alburnoides bipunctatus, Sabanejewia aurata, Nemacheilus angorae, Barbatula barbatula caucasica.

Birds

There are 192 species of birds belonging to 44 families in the territory of the reserve. 63 species of them permanently live in the reserve, 83 species are considered as nesting and migrating birds, 83 species can be found during spring and autumn migration period of time and 11 species are wintering. 10 species are considered as itinerant and appear in the reserve only within nesting period, though they don't nest there. 5 species are considered accidentally appeared birds. 42 bird species (Aegypius monachus, Circus macrourus, Falco naumanni,Coracias garrulous,Ficedula semitorquata etc.) found in Khosrov reserve are included in the International Red Data Book and Red Data Book of Armenia.

Alectoris chukar, Pterocles orientalis, Caprimulgus europaeus, Athene noctua, Coracias garrulus , Upupa epops , Merops apiaster occur in rocky biotopes of semi-deserts, arid concaves, mountain steppes and meadows .

Sparrow fauna is very rich in Khosrov reserve. One can find the following species in semi-deserts with sparse vegetation and rocky ways out, as well as in arid biotopes: Melanocorypha bimaculata, Calandrella brachydactyla, Galerida cristata, Carpospiza brachydactyla, Bucanetes mongolicus, Bucanetes githagineus, Rhodopechys sanguineus, Oenanthe isabellina, Oenanthe finschii, Anthus campestris and Cercotrichas galactotes.

Perdix perdix is widespread in steppes, bushes / shrubs and brushwoods. Coturnix coturnix nests in the high grass meadows.

Predatory birds are bearded griffon (Gypaetus Barbatus), Neophron percnopterus, Gyps fulvus, Gypaetus barbatus, Aegypius monachus, Buteo rufinus, Aquila chrysaetus, Falco tinnunculus , Falco peregrinus and the most rare bird in Armenia is Falco biarmicus.The forest territories are inhabited by Pernis apivorus, Milvus migrans, Circateus gallicus, Buteo buteo, Accipiter nisus and Accipiter gentilis, Aquila pomorina, Hieraaetus pennatus, Dendrocopos major, Accipiter brevipes, Falco subbuteo, Garrulus glandarius, Fringilla coelebs, Carduelis chloris.

Luscinia megarhynchos, Cettia cetti, Ficedula semitorquata, Muscicipa striata, Aegithalos caudatus, Remiz pendulinus, Oriolus oriolus and Lanius minor are typical for river valley forests. Turdus merula , Sylvia communis, Sylvia borin , Troglodytes troglodutes inhabit forest bush areas. Ravines covered with bushes are inhabited by Irania gutturalis, Sylvia crassirostris, Sylvia nisoria, Lanius senator, Emberiza melanocephala, Lanius collurio.Lullula arborea, Turdus torquatus, Turdus viscivorus, Silvia curruca, Serinus pusillus, Emberiza cia can often be found in sparse juniper forests, and Prunella ocularis often occur in the juniper forests located in high zone. In winter you can find here Carduelis spinus, Fringilla montifringilla, Regulus regulus. Anthus trivialis, Prunella modularis, Erithacus rubecula, Phoenicurus phoenicurus, Turdus philomelus, Phylloscopus trochiloides, Phylloscopus collubita, Parus ater, Parus caeruleus, Parus major, Pyrrhula pyrrhula,Coccothraustes coccothraustes often occur in broadleaf forests. Monticola solitarius, Sitta tephronota, Sturnus roseus, Petronia petronia, Bubo bubo, Apus melba, Apus apus, Columba livia, Cuculus canoris, Columba oenas, Columba palumbus, Asio otus often occur in semi-steppe rocks.Ptyonoprogne rupestris, Prunella modularis, Phoenicurus ochruros, Monticola saxsatilis, Sitta neumayer, Tichodroma

muraria, Montifringilla nivalis and Pyrrhocorax pyrrhocorax inhabit high mountain zones. Eremophila alpestris, Anthus spinoletta, Anthus pratensis, Saxicola rubetra, Oenanthe oenanthe, Carduelis flavirostris, Carpodacus erythrinus are typical / common for high mountain meadows. Acrocephalus palustris and Luscinia svecica often occur in high grasses (near mountain springs), and Motocilla cinerea, Cinclus cinclus occur near mountain rivers.

4. Cultural Heritage

Historical-architectural monuments: Havuts-Tar Monastery (11-13th centuries), stone arch-bridge across the Azat River (12th century), cross-stones. "Khosrov Forest" state reserve is the reserve of national and historic significance. It is the oldest preserved flora and fauna museum in Armenia.

In “Khosrov Forest” state reserve there are Kakavaberd, Havuts Tar and Aghjots vank monastic complexes, Kakavaberd, Sakraberd fort - castles, Blrashen, Yelija, Bayburd, big and small Gilans, Avanik, Vanstan (Imirzik / Imirzek) Berdatak, Avanik, Hand , Khosrov, Zimmi, Jghin, Mankuk, Spitakavank and other places that used to be villages, three-dozen churches, several hundred khatchkars / cross-stones and gravestones, medieval bridge and other historical monuments, that are silent witnesses of the past.

The cozy corners of "Khosrov Forest “ state reserve keep the first human cultural development imprints (engraved rock images, traces of ancient civilization, archaeological monuments and sites of historic and cultural great value) that can make ecotourism impressions unforgettable and give wide opportunities for the ecotourism development in the given area.

Mankuk uninhabited village

This ancient site is located on the upper part of Mankuk river valley. The land route goes up from Jghon, cuts the forest spread on the mountain brush slopes of Khach and again goes down to Mankuk river valley where two uninhabited villages are located. Till the 14th century the Mamikoneans’ generations had estates in Mankuk, where the Mamikoneans’ mausoleum, family cemetery with more than a dozen of wonderful decorated cross-stones and the carved gravestones – cross-stones of Toros, Grigor and Mariam Mamikoneans were preserved.

Old broad cemetery is located on the eastern highland of the village ruins with many delicately carved khachkars / cross-stones. The most part of the cross-stones are mass with rich and stable records.

Here one can find a semi- damaged delicately carved cross-stone of the 10th -11th centuries where “Sakraberd” name is noted on one of its carved records.

Sakraberd

There are records since early middle ages that mention about Sakraberd, one of the centers of rulers residence of Urtseats ministry. It is one of the ancient and significant forts of Ayrarat state. Ghazaros Parpetsi mentioned / recorded about this fort. Sakraberd is mentioned in Haysmavurk written in 1492. Here Sakraberd village is mentioned with St. Stepanos church that was possibly located near the fort. The village was named after the name of the fort. Sakraberd was abandoned after the deportation in 1604.

Sakraberd is located on the left bank of Khosrov River, on the high rocky mountain top. The fort was constructed on a small mountain plain. At the foot of the mountain one can find a homonymic uninhabited village with various dwelling and household buildings, and a large cemetery ruins rich with cross-stones.

Spitak monastry and homonymic uninhabited village were constructed on the afforested mountain slope of the right bank of Mankuk River. Only semi-ruins are preserved.

Urts uninhabited city –

Castle George Marzpetuni Fortress The province, river, mountain range and settlement called Urts are well known since the middle ages. The province was flourishing and prosperous during the IV - VII and XII – XV centuries. In 1604, after the deportation of the Armenian inhabitants organized by Shah Abbas the village was not reconstructed and re-inhabited. Historical Ghevond also mentioned about the rulers and regiment of Urts. Kirakos Gandzaketsi mentioned Urtsn as the estate of Orbelian rulers.

The city of the minister's residence was Urts that had its fortress-castle. It was a well-known education center during its second flourishing circle. Urts monastery noted as an educational center in the written records.

Church, which is located on the right bank of Khosrov River, a little bit up from the confluence of Khosrov and Vedi rivers, is with a basilic structure.

Gharabaghlar uninhabited village is located at the foot of Khosrovasar mountain of Urtsadzor historical state.

Avanik or Small Shen

Avanik is located in Milli River Valley. It was noted as a tax-payer village to Khor Virap in a number of property records of the 15-16th centuries.

Avanik is rich with historical monuments that clarify its history.

The tumbledown church can be found in the eastern part of Avanik. According to the historical-architectural analysis of the data it was built in the IV-V centuries. The ruins of buildings with carved crosses and pieces of cross-stones of the IX - X centuries, as well as the cemetery ruins are preserved.

Geghmahovit

It is located at the confluence of Milli river and Aghjo and Gillan tributaries

A pentahedral church with a basilic structure is built from perfectly hewn basalt in the village center. It has a felt cover. Separate parts of cornice are preserved. There are no preserved historical data on the foundation of the church of Geghmahovit village, though the architectural analyses show that it was constructed in the V-VI centuries. While studying the monument a record stone was found, the carved record is in Greek and with inverted letters so that it can be read with the help of mirror. The Armenian translation of the record is "Health" and "Bliss". Decorated caps and frescoes are preserved, in the center of which equal-winged crosses are engraved. The church is considered as the best samples / models of early medieval architecture.

Zimmi (Zmishavan)

The uninhabited village is located to the north from Mankuk uninhabited village. Its name "Zmishavan" that has Armenian breath is preserved. No written data about the foundation of the village was preserved. There is a church in a small village that dates back in the 10th century and is semi-stable / semi-ruined. A cemetery dated back in the 10-16th centuries is preserved in the territory of the uninhabited village. Only one unique cross-stone dated back in 1161 of 10 cross-stones dated back in the 12-15th centuries is preserved in the territory.

Berdatak

It is located in a picturesque valley of Milli river to the south-east from Geghmahovit village. It existed till the 1950s. Berdatak old settlement ruins are in Kakavadzor, at the foot of the rock where we can find the medieval significant fort Kakavaberd. Probably the name Berdatak derived from here. The uninhabited village was inhabited in the XVII - XVIII centuries most probably after the powerful earthquake in 1679. A wonderful panorama from Berdatak opens to Hazaradzor, Kakavaberd cliffs and Kajaru canyon / gorge.

Spitakavank

It is an uninhabited village of the 10-14th centuries that is located on the right bank of Mankuk river, the tributary of Vedi river. It was abandoned in 1950.

Khosrov uninhabited village

The uninhabited village is situated on the right bank of Khosrov river. It was inhabited till the 1940s. There are no preserved written data on the foundation of Khosrov uninhabited village and only the existence of historical monuments can prove its antiquity.

The 12-16th centuries were flourishing for the village. There one can find the remained church ruins (13th century), cemetery (12-16th centuries) and chapel dug / carved out of the rock (11-13th centuries).

Khosrov uninhabited village and the cupola-centered church with a single entrance were probably constructed / founded in the XII century.One can see a massif (a fort of birds) situated at the altitude of 2000-2100 m. above sea level from the old uninhabited village territory. It is the favorite habitat for predatory birds.

Jghin

It is one of the ancient settlements of Urts province. It is located on the right bank of Mankuk tributary of Vedi River, in a beautiful concavity with lots of springs surrounded by forest covered mountains. There are no preserved bibliographic data on the village foundation. Only in 1330, in a modeled « Evangelist» diary written by the writer Kirakos Yerzenkats It is indicated that the duplication was made in Jghona desert. Two cemeteries are preserved. One of them is located in the village and today is in a ruined condition. Mainly record gravestones are preserved. According to the records it turned out that the cemetery existed in the 10th century.

More than 10 cross-stones displaced and placed side by side, some of which dated back in 1522 and 1523, are preserved on the southern border of the uninhabited village, on the road that leads to Khach gorge. The decorated cross-stones typical for the 9-10th centuries are accepted as unique models and at the same time they are very remarkable. Next to the cross-stones we can find preserved rock images dated back in the 5-3th centuries BC. The existence of this monument confirms that Jghona uninhabited village was inhabited during the ancient times.A diary written in 1330 in Jghona desert (anapatakan - One who lives alone, or in solitude, in isolation or seclusion, especially for religious reasons; an anchoret, hermit or recluse) have been preserved till nowadays.

Ancient bridge

The bridge was built in the XI century on Azat River. It connects Garni to Havuts Tar monastery

Gilan

Two abandoned residences located two kilometers far from one another in the valley of Karahun streamlet, left-hand tributary of Milli River. One of them is situated in the north and called Mets / Big Gilan and the other situated in the south called Poqr / Small Gilan. They were flourishing and well-built villages. The names of these villages were first touched upon / noted by Simon Yerevantsi Catholicos as a tax - payer to Aghjots monastery. Church ruins, cemetery and some crosses carved / engraved in the rock are preserved in Small Gilan. A large cemetery with record cross-stone gravestones is preserved in Big Gilan. There are also cemetery field ruins.

Aghjots Monastery (Monastic complex)

Aghjots monastery is situated 7 km to the south from Geghard, on the mountain slope. It was one of the important spiritual centers of medieval Armenia. There was also a nunnery.

The main church / Saint Stephanos / was built in the beginning of the 13th century. It is a cupola-centered church with a cross-shape plan and prayer houses at 4 corners.A church porch / parvis was built on the western side of the church in the second half of the 13th century. Its roof is leaned against a pair of crossing arches. In 1270 Jeremiah abbot with the help of Vasak Khaghbakyan built St. Paul and

Peter Church (Surb Poghos- Petros) on the northern side of St. Stepanos church. It is a one-nave felt basilic cupola-centered church and has three prayer houses. The sculptures of apostles Peter and Paul on both sides of the church entrance are remarkable.

Aghjots monastery was surrounded by grey - blue basalt wall. There were oil mill, guest house, dwelling and consumer buildings, gardens and properties. There are cemetery ruins with a number of cross-stones and gravestones near the church. There are image sculptures on Old and New Testament themes in the monastic complex. An episode from Dreadful judgment sculptured / carved on the western front of S. Stephanos church.

Aghjots monastery served not only as a religious / spiritual but also educational center. Famous / well known medieval historian and pedagogue Vartan Areveltsi/ Vartan Gandzaketsi / founded a school here in the second half of the 13th century. Aghjots monastery were repeatedly subject to robbery and devastation (during Persian shah Shah Abbas' raid / 1603-1605/; big earthquake /1679/; the last raids of the Lezgins and conflicts between Christians and Muslims held in the region / 1905-1906/).

Some walls of the church porch / parvis are preserved.

Kakavaberd

Kakavaberd / Geghayo, Keghayo, Geghi, Keghi fortress, Tatul fortress / are brilliant fort-construction models of historical Armenia. It is located 12 km to the south-east from Garni, on the right bank of Azat river. The fortress now exists and is quite well preserved. It is inaccessible from three sides as it was surrounded by natural gulfs (abysses / precipices) and huge rocks. The forth side is fenced / enclosed as it was not protected by natural barriers. The walls / fences prolonged to the north-east have 2-2.5 meters thickness, near the gate the thickness is 2.60 m. The height of the walls is 8.15 m. The northern towers are eight and their height is more than 10 meters. There are anterooms at the bottom of some towers, as well as there is a round room ad small windows inside some of the towers. There is a chapel dug / carved out of the rock with a cross carved on the front at the entrance near the gate of the fortress.

The citadel is situated on the western side of the fortress. There are noticeable building ruins, too.

The fortress took the name "Kakavaberd" as there are numerous partridges / willow ptarmigans thereabout; the original name was "Geghama Monastery" after the name of the highland. Kakavaberd is also called Tatul fortress, as it is very similar to Tmkaberd in Javakhq.

Hovhannes Draskhanakerttsi (9-10 centuries) was the first to mention about the fortress during the description of the retreat of Arab general / military leader Bsheri who was defeated during the sea battle in Sevan by Ashot Erkat /Iron/ Bagratuni.

In the 11th century the fort was owned by the Pahlavunis and in the 12-13th centuries the Proshyans were the rulers here. Later on, Stephanos Orbelyan left a written memoire about the fort giving Geghi name to the fort where he described the battle held near Garni village/city in 1225.

There is no precise data on the foundation and destruction of Kakavaberd fort. It was probably destroyed in 1679 from the earthquake after which it was not reconstructed.

Havuts Tar Monastic complex

Havuts Tar monastic complex is located to the east from Garni, on top of the mountain that is on the left bank of Azat River. The monastic complex was one of the remarkable religious and cultural centers of Medieval Armenia. In 1013, Grigor Magistros constructed St. Rescue church in this complex referred to the Early Middle Ages. The rise of Havuts Tar was during the XII-XIV centuries and was destroyed by a big earthquake in 1679. Astvatsatur catholicos renovated the monastery in the XVIII century.

Havuts Tar consists of two monument-groups located approximately one hundred meters far from one another.The main church/ XIII century / of the western monument-group is cross-shaped inside and

rectangular outside and has prayer houses at 4 corners. It was constructed from perfectly hewn reddish tuff. The walls are rich with records. The dome / cupola and roof of the church are destroyed. There are two one-nave semi-destroyed chapels near the church from the southern side. There are dwelling rooms adjacent to the walls from the north and a felt guest house from the south- west.

The eastern monument-group was completely rebuilt / reconstructed in the first half of the 18th century. The stones of the church and church porch / parvis of the monastery built by Grigor Magistros were used. In 1721, Astvatsatur catholicos began the construction of St. Karapet church, which was left unfinished due to the invasion of the Lezgins.

According to legend, the name of Havuts Tar, that means bird flight, is linked / connected to the Armenian priest who healed Lenk - Temur that attacked Armenia.

For payment, he asked the invader to release as many prisoners as could enter the Church, and when the prisoners entered the church, the priest converted them into birds.

The monastery has also the name of St. Rescue, as here was the remarkable holy crucifixion rescue cross-stone.

5. Educational interest

"Khosrov Forest" state reserve organizes specialized scientific – cognitive and hiking tours, as well as tours envisaged for the environment lovers. There are car, horse back riding, hiking and pedestrian tours.

In the reserve area one can find rentals and selling booths where the necessary accessories / equipments and food can be acquired for the tours. There are lodging and dining facilities operating in the buffer zone of the reserve and adjacent communities. Various entertainments, ceremonies dedicated to national traditions, holidays are organized, as well as souvenirs are sold.

There are 2 visitor centres in "Khosrov Forest" State Reserve.

The following trails are available for the visitors:

Trail N 1 – Garni and Kakavaberd districts, Havuts Tar

This trail passes through the picturesque canyon of Azat River. It includes extremely rich both plant / flora and animal / fauna species, marvelous diversity of natural landscapes, ancient uninhabited villages, as well as a significant regional and cultural center of Medieval Armenia – Havuts Tar monastic complex. In the territory one can find Bezoar goat (Capra aegagrus), Caucasian brown bear, Gyps fulvus and a range of reptile species.

The trail starts from the route leading from Garni village towards the canyon of Goght River, then passes through the bridge and reaches Havuts Tar monastic complex / X-XIII /. It is located on the top of a picturesque mountain, on the left bank of Goght River. Along the trail leading to the monastery one can find bright green big and middle size lizards and on the rocks grey colored lizards of Caucasus agama species can be found. Chukar Partridge occurs on the rocky slopes. A range of wild bird species are common for these areas. Sometimes it is possible to meet a fox and hare in the open field.

The trail passes from the monastery though the slope covered with thorny bushes, then turns out to a plane area covered with ephedra procera, elaeagnus pungens, cerasus inkana, round-leaf ash-tree (fraxinus), padus and pyrus. And subsequently the trail reaches the ruins of Yelija abandoned village /XVIII-XIX centuries /. The surrounding landscape is mainly a mountain-steppe landscape; some areas are covered with bushes, northern slopes - with sparse juniper forests.

One can see Aghjots St. Stepanos monastic complex /IV-XIII/ and steep mountain slopes of the surrounding valleys from Yelija abandoned village to the south-east. The rocky steeps of mountain slopes are specific biotopes for vipera lebetina and montivipera raddei.The trail descends into Glan river canyon and goes up to Glan abandoned village though the inclined mountain slope. On both sides the monument is surrounded by abyssal gorges and cogged mountain tops. Aghjots monastic complex is visible in the north 1 km from here.

The length of the trail is 10.5 km at middle altitude above sea level. Horse back riding, hiking and pedestrian tours, partially car tours are possible here. The road is divided into two directions from Glan abandoned village.

Trail N 1.1

The trail reaches the springs on Glan river bank from Glan uninhabited village, then goes to Geghmahovit abandoned village.A one-nave basilic church is located in the central part of Geghmahovit that can be seen from the bridge. The trail continues from here through Azat river picturesque canyon and ends near the roadway gate of Garni district of the reserve.

The length of the trail is 2.3 km.

Trail N 1.2

The trail passes from Glan though the ruins of settlement and reaches Sevakajur River. A beautiful view / landscape is visible from the bridge over steep cliffs of the river gorge.The river flows down 100 meters though rapids from the bridge creating a picturesque waterfall of about 10 meters height. There is an observation post on the right side of the road from where a beautiful view (Valley of Sevakajur River) opens. Cross-stones and ruined dwellings are preserved 350 meters far from the bridge. The trail leads from here to Avanik abandoned village from where through the picturesque canyon of Azat river it reaches Geghamahovit and ends up near the roadway gate of Garni district of Khosrov reserve.

The length of the trail is 5.8 km.

Trail N 2 – Kakavaberd district, Vanstan

The trail passes through the territory where various historical-architectural monuments are located, as well as near waterfalls and the picturesque canyon of Azat River. It attracts one's attention with beautiful views. In the territory one can find Bezoar goat (Capra aegagrus), Caucasian brown bear, Gyps fulvus and a range of reptile species.

The trail starts from Avanik uninhabited village, reaches Vanstan and Berdatak abandoned villages, then returns through Azat river crossing to Avanik and Geghmahovit abandoned villages and ends up in Garni district of Khosrov reserve. The trail reaches Vanstan abandoned village /XII-XVIII centuries/ from the small house of Kakavaberd district office. Here you can find nesting places of White Headed Vulture (Gyps fulvus). There are the following big mammals (wolf, brown bear, Bezoar goat) and reptiles (rocky lizards, transcaucasus agama, and some species of elaphe). Vipera lebetina can be found sometimes on rocky cliffs and in a heap of stones. The trail reaches the first cross-stone on the roadside, then the village church. The cemetery with Armenian gravestones is spread towards the west. There are various cross-stones in the territory.

An amazing view of Katur canyon and Kakavaberd opens from the settlement. Then the trail reaches Katur canyon from where a beautiful view of Azat River Valley opens. Then it rises up towards Kakavaberd gorge from where a panorama of Ukhtakunq (Hazaradzor), crossroad of Darband gorge and Kakavaberd cliffs opens.

The trail passes through the ruins of Berdatak abandoned village and reaches the crossway. From here it continues through Azat River picturesque canyon towards Avanik abandoned village, Geghamahovit and ends up near the roadway gate of Garni district of Khosrov reserve.

Horse back riding, hiking and pedestrian tours, partially car tours are available here.
The length of the route is 4.9 km.

Trail N 3 – Kakavaberd district, Kakavaberd

The trail passes through the territory where various historical-architectural monuments are located, through gorges, goes along Kakavaberd fortress, waterfalls and attracts one's attention with its complexity, beautiful views and leaves unforgettable impression. Aegypius monachus, hystrix, Bezoar goat, Caucasus brown bear and wild swine can be found in the territory. The territory is rich with cross-stones, semi-ruins church complexes, decorated gravestones and ruins of dwellings.

Various species of reptiles, birds and mammals can be found along the trail.

Not big herds of Bezoar goats, brown bear traces can often be met on the rock slopes, montivipera raddei and elaphe hohenackeri (trans-Caucasian ratsnake) registered in Red Data Book of RA can be found on the steep rocky slopes. Some nesting places of Gyps fulvus can be seen on both sides of the gorge.

The length of the trail is 8 km. Horse back riding, hiking and pedestrian tours, partially car tours are available here. It is possible to reach Avanik and Geghmahovit uninhabited villages from Nerqin Vanstan. The trail ends up near the roadway gate of Garni district of Khosrov reserve.

Trail N 4 – Khosrov district, Trchnaberd

The trail passes through the territory that hosts numerous historical-architectural monuments, forests, and a picturesque canyon of Khosrov River and attracts one's attention with beautiful views and panoramas.

The trail starts from the confluence of Vedi and Khosrov rivers, reaches Tap fortress, then continues along Khosrov river-bed till the visitors' center, Aghasibek abandoned village, White house, Khosrov abandoned village, observation post and reaches Trchnaberd passing through the oak forest.

The trail is rich in Fauna. The following reptiles can be found: Coluber ravergieri, elaphe rufodorsata, elaphe hohenackeri, Eryx jaculus, Lacerta strigata. Bezoar goat can be found on the rock slopes. This is the only place in Armenia where Aegypius monachus registered in IUCN Red Data Book nests in juniper sparse forests. The following mammals can be found: Bezoar goat, Caucasian brown bear, wolf, fox, as well as wild swine in the river valleys. Khosrov river flows along the whole trail.

Horse back riding, hiking and pedestrian tours, partially car tours are available here. The length of the trail is 9 km.

Trail N 4.1 Khosrov district, observation post

The trail takes to the ancient abandoned Khosrov village, where the village church of the XIII century is preserved in a ruined condition. It is possible to see Bezoar goats in the territory. On the bottom one can see the deep gorges of Khosrov River and its tributaries where one can often meet wild swine. The length of the trail is 1.2 km.

Trail N 4.2 – Khosrov district, Trchnaberd

The trail passes through the oak thick forest and reaches Trchnaberd. The trail area is rich in fauna and different species of flora. A beautiful view opens from Trchnaberd on the Valley of Spitakjur River. The length of the trail is 3 km.

Trail N 5 – Khachadzor district, Mankuk

Khachadzor trail stretches through the picturesque gorge of Mankuk River towards the eastern parts of Khosrov forest. An ancient abandoned village of historical significance, churches, decorated cross-stones and gravestones with records, amazing and picturesque landscapes, and natural lakes are in the neighborhood of the trail. The trail is extremely rich in different species of flora and fauna. Bezoar goat, Caucasian brown bear, wild swine, wolf, fox, a range of reptile species can be found in the territory and on the high mountain tops even possible to find Caucasus leopard (Panthera pardus) registered in IUCN Red Book. The area is also rich in bird and reptile fauna, some of the species are registered in Red Data Book of RA. It is possible to find here Wild Pear (Pyrus pyraster), Amygdalus, Elaeagnus, Rosa, White Birch (Betula papyrifera).

The trail starts from the cross-road that leads to Khachadzor and Khosrov districts and goes towards Khachadzor district. One can see Zimmi uninhabited village on the right side of the trail. Then the trail stretches towards an amazing natural Lake Couple "Jghin lake" surrounded with reed (Phragmites). Then it goes up to the mausoleum of Mamikonyan rulers. Then the trail leads to Mankuk uninhabited village. The cemetery of the village with cross-stones rich with delicately carved records is located on the highland. The ruins of Sakraberd fortress and Sakraberd abandoned village are located in front of Mankuk village. The trail passing near the habitats of Bezoar goats, reaches Spitakvanq abandoned village and Spitak Vank church.

The length of the trail is 18.5 km and is moderately complex. Horse back riding, hiking and pedestrian tours, partially car tours are available here.

Scientific examinations

Since 90s the scientific research of the biodiversity of the <Khosrov Forest> State Reserve is undertaken basically by the virtue of employees of the Institutes of the Botany and Zoology of RA NAS and at the scope of several international environmental grants/projects. Scientific research in the state preserve during 2002-2004 partially was implemented by the virtue of employees of the Institutes of the Botany and Zoology of NAS of RA, by the direct participation of the authority and the employees of the state reserve.

According to the scientific cooperation contract since 2000 the employees of the Institute of Zoology of RA NAS and Tula zoo ecotourism expedition are implementing the inventory works of the several insect groups.

Researchers of the Institute of Zoology of Voronej State University of Russian Federation performed the examination and inventory works of the invertebrates of the state preserve, and as a consequence 49 species were studied. At the state reserve project works of the <The protection and ecology of Armenian panther of Khosrov Forests> were implemented in 2003 by the financial and organizational support of the Italian "La Torbiera" Zoological company, and by the virtue of their Youth ecological group.

At the scope of the <Panther protection> project which was financed by the <National Trust of Disappearing Species> England, in May and November 2004 monitoring of the panther was done at the Khosrov and Khachadzor areas of the state reserve by the virtue of the Youth ecological group.

In the Caucasus region, at the scope of the <Panther protection> project, capacity assessment and support works are underway by the virtue of the World Wide Foundation (WWF). Within that project also monitoring works of panther, Armenian muflon and bezoar goat were implemented aimed to assess the condition of their populations.

At 2003-2005 <Protection of the black vulture in Armenia> project was implemented by the employees of the Institute of Zoology of RA NAS and <Protecting the birds of Armenia> non-Governmental Organization at the scope of <Assessing the conservation status of Armenian vultures sentinels of environmental change> grant program which is financed by donor organizations CRDF 12025/NFSAT BI 062-02 and Saving Black Vulture. The examination of the birds of <Khosrov Forests> State Reserve was implemented.

Financial support was given also from the same organization to enhance the productivity of the works aimed to protect the Black Vulture (Monachus). Research was done mainly to study the ecology of reproduction and nest of Black Vulture, Whitehead vulture and gishanggh. At the wings of the above

mentioned bird's squeakers coloured differentials were attached, and to enhance the productivity of their breeding additional feedings were organized mainly by mules. The results of the works done together with the Institute of Zoology of RA NAS allow assessing the present condition of above mentioned bird species populations. The latter was taken into consideration during the mapping, adjustment and revision works of the borders of the state preserve.

Within the framework of the contract between the RA NAS Institute of Zoology together with the St. Luis Zoo of USA and Institute of Zoology of AS of Russian Federation, since 2004 the investigation works of reptiles are underway in Armenia and particularly in the state preserve area.

By the financial support of the St. Luis Zoo of USA and within the framework of <The ecological and biotope distribution of Armenian viper and its movements> program since May 2004 scientific investigation works have started in Kakhavaberd area of the state reserve. In the program implementation working group are included internationally recognized scientists from Institute of Zoology of RA NAS, St. Luis Zoo of USA, Institute of Zoology of AS of Russian Federation, and Tula zoo ecotourism. Studies were done to clarify the classification and ecological features of reptiles, where the biotope distribution and movement of the Armenian viper were studied by using the radio telemetric methods. It became possible to study the seasonal activity and the radius of the movement of Armenian viper.

6. Site description

Visitors devoted to the natureScientists and students, participants of different scientific expeditions- botanists, zoologists, archaeologists, architects, geologists etc.

Participants of the specialized tours- bird watchers, botanical, geoecological specialists etc. The most famous and prevailing one is the bird watching.

- Interested visitor in the nature. These are different from the others that have more comprehensive interests, but do not have advanced knowledge distinctive to the formers.

- Interested Visitor in the culture. To this type belong majority of the tourists visiting Armenia.Particularly worth mentioning, that the main visitors of the protecting zones are the population of Armenia.

From this point of view/based on this, it is important from the point of the development of the market efforts inside Armenia, and in the foreign market particularly in Europe, Russia and Northern America.

Advertising materials of the state reserve aimed only at the description of natural and cultural values as well as their protection ideology.

The leaflets including maps and the detailed description of the expeditionary routes inside the borders of the state reserve are provided only to the appropriate target groups, by escaping the wide and obvious advertisement of the state preserve area as a popular walking place that can bring unrecoverable violations of the regime.

<Khosrov Forest> State Reserve advertising materials:

Printed materials – leaflets, posters, postcards, travel guides, brief descriptions of attractive places, photos etc.

Videos – films, advertising clips etc.

Electronical materials- internet web pages.

Especially worth mentioning, that the preparation of advertising materials in the sphere of tourism is a highly specialised work. The tourism of protected areas has its own peculiarities, but in Armenia there are no such advertising attempts yet. For this reason, that is the work of the employees of the protected areas to guide the preparation of the advertising materials.

6.1. Vulnerability:

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.

Khosrov State Reserve was formed/established according to the ASSR Minister’s Council ԫ-341, September 13th decision in 1958, in pursuance of the environmental law adopted by the ASSR Supreme Council in May 14th IV convocation at 1985.

<Khosrov Forest> State Reserve is situated to the east of the town of Yerevan at the administrative area of Kotayq and Ararat marzes/counties.

The overall area covered by the reserve is 23095.5 ha.

6.2. Protection status:

“Khosrov Forest” state reserve is under state ownership.

6.3. Ownership:

The State Reserve has been collecting data about wildlife, flora and inanimate nature since its foundation. The oldest data are in form of paper lists. More recent data were collected in databases and in GIS formats.

Certain databases adopted by State Reserve, especially the fundamental topographical maps, Regions bodies.State Reserve carries out by itself the following data bases associated to Arcview shapefiles:

Forest map
<Khosrov Forest> State Reserve Locations and Square’s Networks map
<Khosrov Forest> State Reserve Administrative borders of neighboring communities map
<Khosrov Forest> State Reserve (present, new suggested, under amendment by the decision of ASSR Minister’s Council II stage in 1985) Borders map
<Khosrov Forest> State Reserve Present borders map
<Khosrov Forest> State Reserve Touristic routes and constructions map
<Khosrov Forest> State Reserve Space depiction map
<Khosrov Forest> State Reserve Distribution of floral species included in the Red Book of RA map
<Khosrov Forest> State Reserve Forest areas map
<Khosrov Forest> State Reserve Distribution of fauna species included in the Red Book of RA map
daily vertebrates observations
potential vertebrates distribution
animals observations
floristic data (bibliographic and herbarium data included)
priority flora species

The State Reserve has at its disposal:
Landsat and Quickbird satellite images, aerial photos, geo-referenced ortho-photos

Other alpha-numeric databases:
daily vertebrates observations
wild fauna damages
vegetation data

6.3. Documentation:

7. Site Management

2010-2014 Managament Plan of <Khosrov Forest> State Reserve and borders description and Plan approved by the Government of the Republic of Armenia on April 23, 2009 by Gov. Decree No. 500-N.

CONTENT of Managament plan

Nine "Areas of Special Conservation Interest" (ASCI) - that occupy 206 697, 5 ha territory and form around 7 percent of the total area - were selected relevant to the project requirements and described to be involved in "Emerald network" (sites) in Armenia.
The <Khosrov Forest> State Reserve is one of the nine Emerald Sites of Republic of Armenia.

List of species occurred in Khosrov Forest (according Resolution 6 of Bern Convention

Plants –
Invertebrates: Cerambyx cerdo
Fish: Alburnoides bipunctatus
Amphibians and Reptiles: Ablepharus bivittatus, Anguis fragilis, Bufo viridis, Coluber nummifer, Coluber schmidti, Coronella austriaca, Elaphe hohenackeri, Eremias pleskei, Eremias strauchi, Eryx jaculus, Eumeces schneideri, Lacerta raddei, Lacerta strigata, Lacerta valentini, Mabuya aurata, Malpolon monspessulanus, Natrix natrix, Ophisaurus apodus, Ophisops elegans, Pelobates syriacus, Rana macrocnemis, Rana ridibunda, Telescopus fallax, Typhlops vermicularis, Vipera lebetina, Vipera raddei
Birds: Accipiter brevipes, Accipiter gentiles, Accipiter nisus, Acrocephalus arundinaceus, Aegithalos caudatus, Aegolius funereus, Aegypius monachus, Alauda arvensis, Alectoris chukar, Anas crecca, Anas platyrhynchos, Anthus campestris, Anthus pratensis, Anthus spinoletta, Anthus triviales, Apus apus, Aquila chrysaetos, Aquila heliaca, Aquila nipalensis, Aquila pomarina, Asio otus, Athene noctua, Bubo bubo, Buteo buteo, Buteo rufinus, Calandrella brachydactyla, Calandrella rufescens, Caprimulgus europaeus, Carduelis cannabina, Carduelis carduelos, Carduelis chloris, Carduelis flavirostris, Carduelis spinus, Carpodacus erythrinus, Cercotrichas galactotes, Cettia cetti, Cinclus cinclus, Circaetus gallicus, Circus cyaneus, Circus macrourus, Circus pygargus, Columba livia, Columba oenas, Columba palumbus, Coracias garrulus, Corvus corax, Coturnix coturnix, Cuculus canorus, Delichon urbica, Dendrocopos major, Dendrocopos medius, Dendrocopos syriacus, Emberiza cia, Emberiza citrinella, Emberiza melanocephala, Eremophila alpestris, Erithacus rubecula, Falco biarmicus, Falco cherrug, Falco columbarius, Falco naumanni, Falco peregrinus, Falco subbuteo, Falco tinnunculus, Falco vespertinus, Ficedula albicollis, Ficedula semitorquata, Fringilla coelebs, Fringilla montifringilla, Galerida cristata, Gallinago gallinago, Gypaetus barbatus, Gyps fulvus,

Hieraaetus pennatus, Hippolais pallida, Hirundo rustica, Irania gutturalis, Jynx torquilla, Lanius collurio, Lanius minor, Lanius senator, Luscinia luscinia, Luscinia megarhynchos, Luscinia svecica, Melanocorypha bimaculata, Merops apiaster, Miliaria calandra, Milvus migrans, Monticola saxatilis, Monticola solitarius, Montifringilla nivalis, Motacilla alba, Motacilla cinerea, Motacilla flava, Muscicapa striata, Neophron percnopterus, Oenanthe hispanica, Oenanthe isabellina, Oenanthe oenanthe, Oriolus oriolus, Otus scops, Parus ater, Parus caeruleus, Parus major, Passer montanus, Perdix perdix, Pernis apivorus, Petronia petronia, Phoenicurus ochruros, Phoenicurus phoenicurus, Phylloscopus collybita, Phylloscopus trochiloides, Phylloscopus trochilus, Prunella collaris, Prunella modularis, Prunella ocularis, Ptyonoprogne rupestris, Pyrrhocorax graculus, Pyrrhocorax pyrrhocorax, Pyrrhula pyrrhula, Regulus ignicapillus, Regulus regulus, Remiz pendulinus, Riparia riparia, Saxicola rubetra, Saxicola torquata, Serinus pusillus, Sitta neumayer, Sitta tephronota, Streptopelia turtur, Sturnus roseus, Sylvia atricapilla, Sylvia borin, Sylvia communis, Sylvia curruca, Sylvia hortensis, Sylvia nisoria, Tichodroma muraria, Tringa ochropus, Troglodytes troglodytes, Turdus merula, Turdus philomelos, Turdus pilaris, Turdus torquatus, Turdus viscivorus, Upupa epops
Mammals: Canis lupus, Capra aegagrus, Capreolus capreolus, Cervus elaphus, Crocidura russula, Dryomys nitedula, Erinaceus europaeus, Felis silvestris, Glis glis, Lutra lutra, Martes foina, Meles meles, Mustela nivalis, Myotis emarginatus, Myotis nattereri, Neomys fodiens, Nyctalus leisleri, Nyctalus noctula, Panthera pardus, Pipistrellus nathusii, Pipistrellus pipistrellus, Plecotus auritus, Plecotus austriacus, Rhinolophus euryale, Rhinolophus ferrumequinum, Rhinolophus mehelyi, Sorex araneus, Tadarida teniotis, Vormela peregusna
Habitats: 22.1 – Permanent freshwater ponds and lakes, 34.9 – Continental steppes, 41.2 – Oak-hornbeam forests, 42.A – Western Palaearctic juniper forests

Together with the above-mentioned species the following flora and fauna species of national importance are also widespread on the site.
Plants: Allium schchianae, Astragalus holophyllus, Centaurea arpensis, Polygala urartu, Pyrus chosrovica
Invertebrates: Agrilus araxenus, Hyles hyppophaes, Miarus armenus, Onthophagus diversicornis, Papilio alexanor, Proserpinus proserpina, Sphenoptera geghardica
Amphibians and Reptiles: Vipera (Pelias) eriwanensis

7.2. Budget and Personel

The State Reserve's nowadays staff is - 77 units.
Direction: 1 director, 1 Deputy Director
Administrativ sector: -24 people
Scientific sector: 8 people
Protection sector -38 people
Visitors centres - 6 people

Real properties: 2 visitor centres,
Equipment: cars and computer equipment, optical equipment, scientific equipment, surveillance equipment

The State Reserve Board received in the last years the following ordinary State contributions:

Year	Contribution
2007	71.847.5 AMD
2008	79.247.5 AMD
2009	77.535 AMD
2010	77.535 AMD and from Trust fund 45.215
2011	77.535 AMD and from Trust fund 47.625

8. MAP OF THE SITE

- **Physical map:**

NATIONAL MAP NUMBER	SCALE	PROJECTION

REFERENCE TO AVAILABILITY OF BOUNDARIES IN DIGITISED FORM

- **Map of designated sites described in 6.2:**
  Provide this information on a map with the same characteristics as above !
  • Map of designated sites described in 6.2.
  Map 1 <Khosrov Forest> State Reserve, Space depiction
  Map 2 <Khosrov Forest> State Reserve, Distribution of floral species included in the Red Book of RA
  Map 3 <Khosrov Forest> State Reserve, Forest areas
  Map 4 <Khosrov Forest> State Reserve, Distribution of fauna species included in the Red Book of RA
  Map 5 <Khosrov Forest> State Reserve, Locations and Square's Network
  Map 6 <Khosrov Forest> State Reserve, Administrative borders of neighboring communities
  Map 7 <Khosrov Forest> State Reserve, Borders
  (present, new suggested, under amendment by the decision of ASSR Minister's Council II stage in 1985)
  Map 8 <Khosrov Forest> State Reserve, Present borders
  Map 9 <Khosrov Forest> State Preserve, Touristic routes and constructions

- **Aerial photograph(s) included:**

√ YES	☐ NO

NUMBER	AREA	SUBJECT	COPYRIGHT	DATE

9. SLIDES

NUMBER	PLACE	SUBJECT	COPYRIGHT	DATE
	State Reserve	Film		....

	Plant, animal species, habitats	Pictures, views		
	Khosrov Forest State Reserve	Leaflet		
	Trail N 1 – Garni and Kakavaberd districts, Havuts Tar	Leaflet		
	Trail N 2 – Kakavaberd district, Vanstan	Leaflet		
	Trail N 3 – Kakavaberd district, Kakavaberd	Leaflet		
	Trail N 4 – Khosrov district, Trchnaberd	Leaflet		
	Trail N 5 – Khachadzor district, Mankuk	Leaflet		

Annex (Tables 1-6)
Table 1. Distribution of forested areas (ha) by forest species and altitude above sea level
Table 2. Distribution of forested areas by steepness of the slopes (area, ha)
Table 3. Distribution of forested areas by exposition
Table 4. Distribution of forested areas by growth class (bonitet)
Table 5. Distribution of forested areas by dominating species and crown coverage

ACTION PLAN 2009-2013
Table 6. *Action Plan to* Improve Management of Khosrov Forest State Reserve and "Khosrov Forest State Reserve" State Non Commercial Organization

Lists of plant and animal species 1-5

List 1. <Khosrov forest> State Reserve Invertibrates species
List 2. <Khosrov forest> State Reserve Plant species
List 2. List 3. <Khosrov forest> State Reserve Mammals species
List 4. <Khosrov forest> State Reserve Reptiles and amphibians species
List 5. <Khosrov forest> State Reserve Bird species

ACTION PLAN 2009-2013

Table 6. Action Plan to Improve Management of Khosrov Forest State Reserve and "Khosrov Forest State Reserve" State Non Commercial Organization

NN	Activity	Timeframe	Implementer	Source of Financing
1.	**Development of draft legislative acts**			
1.	Provision of legal framework for ecotourism arrangement on the territory of Khosrov Forest State Reserve.	2009-2012	RA MoNP	State budget – maintenance costs and program financing; international financing
2.	Signing of cooperation agreements between "Khosrov Forest State Reserve" SNCO and communities for transit movement of livestock through the reserve territory to summer pastures	2009-2010	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – maintenance costs
3.	Definition of allowed forms of economic activities in buffer zones of Khosrov Forest State Reserve and development of indicators.	2009-2010	RA MoNP	State budget – maintenance costs and program financing
4.	Development of proposals on setting entry fees to the reserve territory, introduction of entry fees.	2009	RA MoNP	State budget – maintenance costs
5.	Development of proposals and definition of the staff positions and number of protection service staff, responsibilities of staff and requirements for staff in "Khosrov Forest State Reserve" SNCO.	2009	RA MoNP	State budget – maintenance costs
6.	Development of a program on development of an incentive system for the staff of "Khosrov Forest State Reserve" SNCO dealing with guarding/protection functions, on introduction and financing of round-the-clock guarding system.	2009-2010	RA MoNP	State budget – maintenance costs and program financing
7.	Development of proposals on thematic planning, development and approval of themes for scientific-research activities in "Khosrov Forest State Reserve" SNCO.	2009-2010	RA MoNP	State budget – maintenance costs and program financing
8.	Clarification of the borders of state owned lands located within administrative borders of the communities adjacent to Khosrov Forest State Reserve and change of their category.	2009-2013	RA MoNP, RA Government	State budget – maintenance costs and program financing

NN	Activity	Timeframe	Implementer	Source of Financing
2.	**Institutional Reforms in "Khosrov Forest State Reserve" SNCO**			
1.	Development of proposals on a new structure for "Khosrov Forest State Reserve" SNCO, including establishment of departments on biodiversity monitoring and tourism management as well as stemming from them the number of new staff and working procedures.	2009	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – maintenance costs and program financing
2.	Approval of the structure and staff list of "Khosrov Forest State Reserve" SNCO.	2009	RA MoNP	State budget – maintenance costs;
3.	Establishment of visitors center for ecotourism organization purposes.	2009-2010	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – maintenance costs and program financing; international financing
3.	**Capacity building, improvement of the staff professional qualification**			
1.	Training on development and maintenance of data base in GIS system.	2009-2010	RA MoNP	State budget – maintenance costs and program financing; international financing
2.	Development of educational programs for the staff of "Khosrov Forest State Reserve" SNCO, training and retraining of staff. Development of draft short-term and long-term programs on staff retraining.	2009 - 2010	RA MoNP	State budget – maintenance costs and program financing; international financing
3.	Approval and implementation of short-term and long-term programs on staff retraining.	2009 -2013	RA MoNP	State budget – maintenance costs and program financing; international financing
4.	Retraining of staff aimed at implementation of biodiversity monitoring.	2009 - 2010	RA MoNP	State budget – program financing; international financing
5.	Organization of study tours for the staff of "Khosrov Forest State Reserve" SNCO.	2009-2013	RA MoNP	State budget – program financing; international financing
6.	Establishment and maintenance of the cadastre of Khosrov Forest State Reserve.	2009	"Khosrov Forest State Reserve" SNCO	State budget – maintenance costs, and program financing; international financing

NN	Activity	Timeframe	Implementer	Source of Financing
7.	Technical strengthening of “Khosrov Forest State Reserve” SNCO.	2009-2013Ã	RA MoNP, “Khosrov Forest State Reserve” SNCO	State budget – maintenance costs, and program financing; international financing
8.	Establishment of satelite internet connection and internal computer network in “Khosrov Forest State Reserve” SNCO.	2009	“Khosrov Forest State Reserve” SNCO	State budget – maintenance costs and program financing; international financing
9.	Implementation of practical trainings on the territory of Khosrov Forest State Reserve.	2009-2013	RA MoNP, “Khosrov Forest State Reserve” SNCO	State budget – maintenance costs and program financing; international financing, RA MoES
4.	**Improvement of management on the Khosrov Forest State Reserve territories**			
1.	Implementation of nature protection measures aimed at promotion of natural regeneration of ecosystems.	2009 - 2013	“Khosrov Forest State Reserve” SNCO	State budget – maintenance costs
2.	Implementation of joint scientific-research activities on the territory of Khosrov Forest State Reserve – inventory and stock-taking of flora and fauna, research of ecological features and others.	2009-2013	“Khosrov Forest State Reserve” SNCO, RA NAS and other scientific-research organizations	State budget – maintenance costs and program financing; international financing

NN	Activity	Timeframe	Implementer	Source of Financing
3.	Improvement of cooperation between state bodies, local self-governing bodies, scientific and environmental entities and state reserve.	2009-2013	"Khosrov Forest State Reserve" SNCO, RA NAS and other scientific-research organizations, adjacent communities, NGOs	State budget – maintenance costs
5.	**Development of tourims and recreation**			
1.	Development of designs for establishment of touristic infrastructure on the territory of the reserve and its buffer zone.	2009-2010	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – program financing; international financing
2.	Implementation of the ecotourism development program on the territory of the reserve and its buffer zone.	2009-2013	"Khosrov Forest State Reserve" SNCO, adjacent communities, respective organizations (by agreement)	State budget – maintenance costs and program financing; international financing, own resources of the communities adjacent to "Khosrov Forest State Reserve" SNCO and respective organizations
3.	Development of a monitoring system for assessment of environmental and social impact of tourism.	2009 – 2010	RA MoNP	State budget – maintenance costs and program financing; international financing
4.	Approval and implementation of the monitoring program on environmental and social impact assessment of the tourism .	2010 - 2013	"Khosrov Forest State Reserve" SNCO	State budget – maintenance costs and program financing; international financing

NN	Activity	Timeframe	Implementer	Source of Financing
5.	Publication of a scientific-popular manual and informational booklets on Khosrov Forest State Reserve in Armenian and English.	2009 -2013	"Khosrov Forest State Reserve" SNCO	State budget – maintenance costs; international financing
7.	**Introduction of biodiversity monitoring (BDM) system**			
1.	Development and implementation of a monitoring system in Khosrov Forest State Reserve (identification of indicators, observation points and sample plots and others).	2009-2013	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – maintenance costs and program financing; international financing
2.	Implementation of monitoring with some pilot indicators (data collection – analysis – forcasts).	2009	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – maintenance costs and program financing; international financing
3.	Development of a program on community representatives involvement in BDM process.	2009	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – maintenance costs
4.	Implementation of the program on community representatives involvement in BDM process.	2009-2013	"Khosrov Forest State Reserve" SNCO	State budget – program financing
5.	Training/retraining on general principles of BDM implementation.	2009-2010	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – program financing
7.	Development of a standard model (protocol) for indicators.	2009-2010	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – maintenance costs and program financing; international financing

NN	Activity	Timeframe	Implementer	Source of Financing
8.	Development of a computer software on BDM data base establishment and maintenance.	2009-2010	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – maintenance costs and program financing; international financing
9.	Training for monitoring implementers of BDM system (preparation, field work).	2009-2010	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – program financing; international financing
10.	Training/retraining for BDM center specialists.	2009-2010	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – program financing; international financing
11.	Procurement, installation and testing of equipment for BDM implementation.	2009-2010 .	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – maintenance costs and program financing; international financing
12.	Establishment of biodiversity data base on the basis of monitoring results.	2009 -2013	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – maintenance costs and program financing; international financing
13.	Improvement and approval of BDM software on the basis of experience gained.	2009-2010	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – program financing; international financing
14.	Introduction of BDM system in state reserve.	2009-2012	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – maintenance costs and program financing; international financing

NN	Activity	Timeframe	Implementer	Source of Financing
15	Development of ways and methods on prevention, mitigation or elimination of existing threats and solution of existing problems on the basis of monitoring results.	2009-2013	RA MoNP, "Khosrov Forest State Reserve" SNCO, adjacent communities, respective organizations (by agreement)	State budget – maintenance costs and program financing; international financing
8.	**Awareness raising of population**			
1.	Development of draft short-term and long-term programs on awareness raising of population about Khosrov Forest State Reserve, including biodiversity monitoring process.	2009- 2011	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – maintenance costs and program financing; international financing
2.	Implementation of short-term and long-term programs on awareness raising of population.	2009-2013	"Khosrov Forest State Reserve" SNCO	State budget – maintenance costs and program financing; international financing
9.	**Construction activities**			
1.	Design and construction works on fencing to prevent livestock access to the reserve territory in Garni and Khachadzor districts.	2009-2010	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – program financing; international financing
2.	Planning, installation and rehabilitation of road-blocks in Khosrov Forest State Reserve.	2009-2010	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – program financing; international financing

NN	Activity	Timeframe	Implementer	Source of Financing
3.	Planning of rehabilitation works on improvement of those trails for transit movement of livestock, which are difficult to pass.	2009	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – program financing; international financing
4.	Implementation of rehabilitation works on improvement of those trails for transit movement of livestock, which are difficult to pass.	2009-2010	Communities, "Khosrov Forest State Reserve" SNCO	State budget – program financing; international financing
5.	Design and construction of watering points in summer pastures of the buffer zone.	2009-2011	RA MoNP, "Khosrov Forest State Reserve" SNCO	State budget – program financing; international financing

Table 1. Distribution of forested areas (ha) by forest species and altitude above sea level

N	Dominating species	Altitude above sea level, m					Total
		900-1200	1201-1500	1501-1700	1701-2000	2001 and higher	
	Protection category - reserve						
1	**Juniper**	-	121	405	203	86	**815**
2	**Oak (seminal)**	-	10	112	626	1123	**1871**
3	**Oak (shoots)**	8	22	18	156	218	**422**
4	**Ash (seminal)**	-	-	79	85	22	**186**
5	**Ash (shoots)**	-	-	4	6	-	**10**
6	**Maple (seminal)**	-	-	-	40	316	**356**
7	**Maple (shoots)**	4	-	67	3	43	**117**
8	**Elm (seminal)**	-	-	6	2	1	**9**
9	**Elm (shoots)**	-	-	2	19	-	**21**
10	**Poplar**	4	5	-	3	-	**12**
11	**Willow**	22	66	71	21	28	**208**
12	**Apricote**	-	62	3	-	-	**65**
13	**Pear**	-	-	-	10	-	**10**
14	**Honeysuckle**	-	1	3	-	-	**4**
15	**Walnut**	12	4	5	-	-	**21**
16	**Mulberry**	-	4	-	-	-	**4**
Total		**50**	**295**	**775**	**1174**	**1837**	**4131**
%%		**1.2**	**7.1**	**18.4**	**28.4**	**44.5**	**100**

Table 2.

Distribution of forested areas by steepness of the slopes (area, ha)

N	Dominating species	The degree of the slope gradient						Total
		till 10	11-20	21-25	26-30	31-35	36 and higher	
1	**Juniper**	-	-	-	140	289	386	**815**
2	**Oak (seminal)**	-	23	485	388	665	310	**1871**
3	**Oak (shoots)**	-	-	51	40	274	57	**422**
4	**Ash (seminal)**	2	26	37	73	48	-	**186**
5	**Ash (shoots)**	1	7	-	-	-	2	**10**
6	**Maple (seminal)**	-	-	47	43	211	55	**356**
7	**Maple (shoots)**	4	-	-	24	55	34	**117**
8	**Elm (seminal)**	-	9	-	10	11	-	**30**
9	**Elm (shoots)**	12	-	-	-	-	-	**12**
10	**Poplar**	64	16	7	37	60	24	**208**
11	**Willow**	1	36	28	-	-	-	**65**
12	**Apricotee**	-	-	-	-	-	10	**10**
13	**Pear**	4	-	-	-	-	-	**4**
14	**Honeysuckle**	18	3	-	-	-	-	**21**
15	**Walnut**	4	-	-	-	-	-	**4**
	Mulberry	**110**	**120**	**655**	**755**	**1610**	**878**	**4131**

	Total	**2.7**	**2.9**	**15.8**	**18.3**	**39**	**21.3**	**100**

Table 3. Distribution of forested areas by exposition

N	Dominating species	Southern positioning, ha	Northern positioning, ha	Total ha
	Protection category - reserve			
1	**Juniper**	361	454	815
2	**Oak (seminal)**	546	1325	1871
3	**Oak (shoots)**	168	254	422
4	**Ash (seminal)**	92	94	186
5	**Ash (shoots)**	-	10	10
6	**Maple (seminal)**	211	145	356
7	**Maple (shoots)**	56	61	117
8	**Elm (seminal)**	11	19	30
9	**Elm (shoots)**	-	12	12
10	**Poplar**	96	112	208
11	**Willow**	25	40	65
12	**Apricot**	-	10	10
13	**Pear**	-	4	4
14	**Honeysuckle**	12	9	21
15	**Walnut**	4	-	4

N	Dominating species	Bonitet classes								Total		Mid Bonitet
		Ia	I	II	III	IV	V	Va	Vb	ha	%	
1	**Juniper**				34	710	71			815	19.2	IV-0
2	**Oak (seminal)**				28	271	1572			1871	45,4	IV-8
3	**Oak (shoots)**						422			422	10,2	V-0
4	**Ash (seminal)**				8	117	61			186	4,6	IV-3
5	**Ash (shoots)**					10				10	0,2	IV-0
6	**Maple (seminal)**					113	243			356	8,7	IV-7
7	**Maple (shoots)**					56	61			117	2,8	IV-5
8	**Elm (seminal)**					9				9	0,2	IV-0
9	**Elm (shoots)**						21			21	0,5	V-0
10	**Poplar**		7	3	2					12	0,3	I-6
11	**Willow**				19	112	77			208	5,1	IV-3
12	**Apricot**					4				4	0,1	IV-0
13	**Pear**				44	21				65	1,7	III-3
14	**Honeysuckle**						10			10	0,2	V-0
15	**Walnut**				19	2				21	0,7	III-1
16	**Mulberry**				2		2			4	0,1	IV-0
	Total		**7**	**3**	**156**	**1425**	**2540**			**4131**	**100**	**IV-6**
	%%		**0.2**	**0.1**	**3.8**	**34.4**	**61.5**			**100**		

	Mulberry	**1582**	**2549**	**4131**
	Total	**38.3**	**61.7**	**100**

Table 4. Distribution of forested areas by growth class (bonitet)

Table 5. Distribution of forested areas by dominating species and crown coverage

N	Dominating species	Completeness					Total ha	Mid Completeness
		0,3	0,4	0,5	0,6	0,7		
	Protection category - reserve							
1	**Juniper**	238	328	219	30	-	**815**	**0.40**
2	**Oak (seminal)**	87	577	880	310	17	**1871**	**0.47**
3	**Oak (shoots)**	11	279	132	-	-	**422**	**0.43**
4	**Ash (seminal)**	-	49	70	52	15	**186**	**0.52**
5	**Ash (shoots)**	7	2	1	-	-	**10**	**0.34**
6	**Maple (seminal)**	2	205	88	18	43	**356**	**0.49**
7	**Maple (shoots)**	17	23	39	44	-	**117**	**0.49**
8	**Elm (seminal)**	-	-	9	-	-	**9**	**0.50**
9	**Elm (shoots)**	10	11	-	-	-	**21**	**0.35**
10	**Poplar**	-	-	8	4	-	**12**	**0.53**
11	**Willow**	46	74	26	62	-	**208**	**0.45**
12	**Apricot**	1	16	28	20	-	**65**	**0.49**
13	**Pear**	10	-	-	-	-	**10**	**0.30**
14	**Honeysuckle**	-	-	4	-	-	**4**	**0.50**
15	**Walnut**	-	10	4	7	-	**22**	**0.47**
16	**Mulberry**	-	-	-	4	-	**4**	**0.60**
	Total	**430**	**157.2**	**1503**	**551**	**75**	**4131**	**0.46**
		10.4	**38.1**	**36.4**	**13.3**	**1.8**	**100**	

Summary of the management plan 2010-2014 of "Khosrov Forest" state reserve

The development of the management plan of «Khosrov Forest» state reserve is addressed to the implementation of the provisions of the Convention on biodiversity, further improvement landscape and biodiversity conservationin the republic and compliancewith international standards, as well as to increase the effectiveness of the activities being implemented in the reserve.

During the development of the management plan the management peculiarities, as well as landscape and biodiversity peculiarities of «Khosrov Forest» state reserve SNCO were reviewed and evaluated.

The assessment was implemented mainly using the methodology developed by World Wildlife Fund (WWF).

The following activities were implemented during the development of the management plan:

1) Collect the archival materials of "Khosrov Forest" state reserve.
2) Collect data on flora and fauna of "Khosrov Forest" state reserve.
3) Study the current situation of economic and recreational activities in the reserve and its protection zone, as well as the use of natural resources.
4) Analyze the management system and administrative-economic arrangements in the reserve and development of proposals.
5) Show the current situation and reveal the causes of deterioration of the endemic, rare and endangered species, their growing areas, nesting areas, habitats and migration routes in the reserve and its protection zone.
6) Analyze the development ways of tourism and adjacent serving branches in the reserve and its protection zone.
7) Define the ways (by car, on horseback, walking) and nature (scientific-cognitive, ecotourism etc.) of tourism, select permissible areas, develop routes in the reserve and its protection zone.
8) Develop proposals on the preparation of tourism advertising and marketing materials.
9) Develop proposals on normative documents necessary for tourism implementation in the reserve and its protection zone.
10) Develop proposals on the establishment of ecotourism and biodiversity monitoring system and implementation activities in the territory of the reserve.
11) Define the indicators of the status of the components of biodiversity in the reserve and its protection zone.
12) Develop proposals on the establishment/ creation of the data base on management and biodiversity.
13) Prepare thematic maps and 5-year action plan of the reserve.

Khosrov state reserve was formed by the decree N ä-341 (13.09.1958) of the USSR Council of Ministers.

The reserve is located in the territory of Ararat marz of RA; it occupies an area of 23213.5 hectares and consists of Garni, Kakavaberd, Khosrov, Khachadzor and Urts districts.

The area of the reserve is isolated from the main infrastructures and only from the south-west borders densely populated Ararat valley.The semi-desert, frigana, thinly growing forest and mountain steppe landscapes (flora (1849 species) and fauna (283 species) unique symbioses) of central Armenia are typical for the territory.

The relief of Khosrov state reserve is due to the active tectonic movements. The major part of the area is located on the mountain slopes (30^0 and above).
Mountain Cartography

Medium-altitude mountainous zone (1500-2300 m) occupies about 50% of the territory of the reserve; low-altitude mountainous zone (up to 1500 m) is distinguished by ravine land dense fragmentations, as a result of which badlands are well developed in the foothills. The accumulations of materials moved from one location to another occupy the major part of the smooth lands.
The highest mountain peaks in the reserve are: Arkhashen - 3079 m, Mankuk - 2926 m, Dagnan- 2535 m, Urts - 2445 m.

Climate

The climate is generally dry-continental with high summer temperatures and cold winters. The following climate types occur here: dry-continental, moderately hot-dry, temperate - hot summer and moderately cold.

Hydro-cartography

The river network comprises Azat and Vedi rivers and a number of their tributaries. The length of Azat River is 40 km, the surface area of watershed is 572 km^2. The length of Vedi River is 58.0 km, the surface area of watershed is 633 km^2. In summer the water of both rivers is used for irrigation purposes.

Landscapes and status of ecosystems

Semi-deserts are widespread on the bottom of the mountain ranges (at a height of 900 to 1250 m).Dry steppes occupy the middle mountain zones (1250-2500m), from 1600m eastern oak forests appear and at a height of 1500-2100m juniper sparse forests can be found.
16% of the reserve territory is covered by forests, 20% are lawns, shrubs, brushwoods and sparse forests, the rest 64 % are different types of symbiosis of mountainous xerophytes.
Mountain-steppe and mountain-meadow landscapes are widespread at a height of 2500 of the reserve territory that are replaced by sub-apline and apline meadows in the high mountainous zone.

The charters of “Khosrov Forest” state forest” state non-commercial organization (SNCO) and “Khosrov Forest” state forest were approved by the RA Government decree N 925-ն (30 May 2002).
“Khor Virap”, “Goravan sands” state sanctuaries are under the jurisdiction of “Khosrov Forest” state forest” state non-commercial organization (SNCO).

“Khor Virap” state sanctuary

The main purpose for the establishment of the reserve is to conserve humid ecosystem of international importance , flora and fauna species, especially waterfowls and their habitats, rare plant species and their growing areas , ensure natural development, reproduction and sustainable use. /Ramsar Convention Site/.

"Goravan sands" state sanctuary

The main purpose for the establishment of the reserve is to conserve the unique desert ecosystem in Transcaucasia, flora and fauna integrity, ensure reproduction and sustainable use.

According to RA law on “Specially Protected Nature Areas” / Artcle 16/ the following is banned in the territory of the state reserve:

1) Use of water resources via water systems and any activity that infringes / violates the water use regime

2) Construction and exploitation of economic and residential facilities, roads, pipelines, electric power transmission lines and other communication ways, except the necessary facilities for the reserve / forester cabin, barriers and border signs etc... /
3) Violation of environmental conditions for the habitats of flora and fauna representatives
4) Hunting, fishing
5) Import and use of new flora and fauna species,
organisms / species / genetically modified through biotechnology, as well as any activity addressed to the increase or decrease of the number of certain species
6) Harvesting of plants, flowers, fruits and seeds, except gathering of the envisaged collections of the reserve for scientific research
7) Logging, livestock grazing, mowing and other vegetation violations
8) Use of pesticides to conserve plants, as well as the use of mineral fertilizers
9) Production, use and storage of radioactive materials and wastes, as well as hazardous or toxic materials that impact on human health and environment
10) Activities related to geological researches that lead to the violation of land cover
11) Exploitation of mineral deposits, and distribution of ore processing facilities
12) Traffic and parking of motor and crawler-type transport vehicles out of the roads and water lines of common use, as well as out of the borders of road network or in the places that are not envisaged for it
13) Any other activity that violates the natural systems and facilities or threatens their conservation.

According to RA law on "Specially Protected Nature Areas" / Artcle 26/ the following is allowed / permitted to be used in the territory of the state reserve:

1) Scientific researches related to natural ecosystems, biodiversity, landscapes, natural heritage, their registration, inventory, monitoring
2) Study tour along the routes defined in the management plans of the state reserve
3) Educational and educational – reproductive practices in educational institutions
4) Mowing and apiculture / beekeeping on the lands allocated to meet needs of the state reserve and its employees according to the regulation determined by the authorized state body.

Maintenance issues of the reserve

The maintenance activities of the state reserve are carried out through maintenance services and district inspectors.

Monitoring Implementation

The following monitoring indicators were selected for biodiversity status and anthropogenic impact in "Khosrov forest" state reserve:

a) Relative percentage of "absolute resting zone" in the total area of the reserve
b) The forest area in percentage in the total area of the state reserve
c) Different forest types in percentage (primary, secondary or plantations) from the total percentage of forest area
d) Deforestation volume (conversion of forest lands to other lands)
e) Volume and percentage of forest areas subject to anthropogenic impacts(deforestation, grazing, mowing, etc...)
f) Number of invasive species and their dissemination
g) Percentage of the lands used for tourism in the total area of the state reserve
h) Species illegally used by population for social purposes

2) Protection zone

a) Agricultural lands according to crops (corn, oil-producing plants, fodder, etc...)
b) Changes in agricultural lands (agricultural land conversion to other lands or vice versa)
c) Number of species endangered as a result of agricultural activities (cattle-breeding, field –crop cultivation, gardening, etc...)

The list of the mentioned indicators for general application are subject to changes during the introduction and implementation of monitoring system in the reserve, adjustment of biodiversity and threatening factors, as well as based on the proposals of the interested parties.

The following widespread and informative indices are used for the indicators selected based on type / population.

1. Available or being absent
2. Number of individuals in each population
3. Dissemination / areal /
4. Absolute and relative richness
5. Population density of individuals
6. Number of populations
7. Age composition
8. Gender composition
9. Phenological indices
10. Productivity and other informative indices