“Gyulagarak Pine” State Sanctuary

Management Plan Structural Model (concept)

Draft

February, 2011

Implementing organization: WWF Armenia

Expert: Armen Gevorgyan

CONTENTS

INTRODUCTION

The Draft structural model of "Gyulagarak Pine" State Sanctuary management plan was prepared by WWF Armenia in the framework of "Improving Forest Law Enforcement and Governance in the European Neighbourhood Policy East Countries and Russia" (ENPI-FLEG) project as a part of the Activity "Assessment of forest sanctuaries in the structure of "Hayantar" SNCO in terms of management and law enforcement efficiency, proposals on improvement, capacity building for the staff to control illegal activities". Prior to the preparation of the management plan, management and law enforcement in the sanctuaries were assessed and proposals on enhancements were made.

For this stage of the project it was planned to prepare a structural model (concept) of a management plan for "Gyulagarak Pine" State Sanctuary, which will further be improved and localized to the Sanctuary conditions. Currently review of RA Forest Code and the RA Law on Specially Protected Nature Areas is in the process. Only after its finalisation it should be possible to complete this draft management plan. It is expected, that the issues related to the protected area management system, planning, functions and legal regimes will be clarified as an outcome of legislative changes.

Guidelines for Management Planning of Protected Areas (IUCN, 2003) were used for preparation of the structural model of the management plan. These guidelines define the management plan for the protected areas as a framework document aimed at the increase of certain outcomes and area management efficiency based on complex analysis of natural-historical and socio- economic peculiarities of the areas, trends of perspective development and efficient use of resources.

ABBREVIATIONS

WWF	World Wide Fund for Nature
IUCN	World Conservation Union
SNCO	State Non-Commercial Organisation
RA	Republic of Armenia
MoNP RA	Ministry of Nature Protection of the Republic of Armenia
MoA RA	Ministry of Agriculture of the Republic of Armenia
MBD	Monitoring of Biological Diversity

1. GENERAL INFORMATION

Introduction

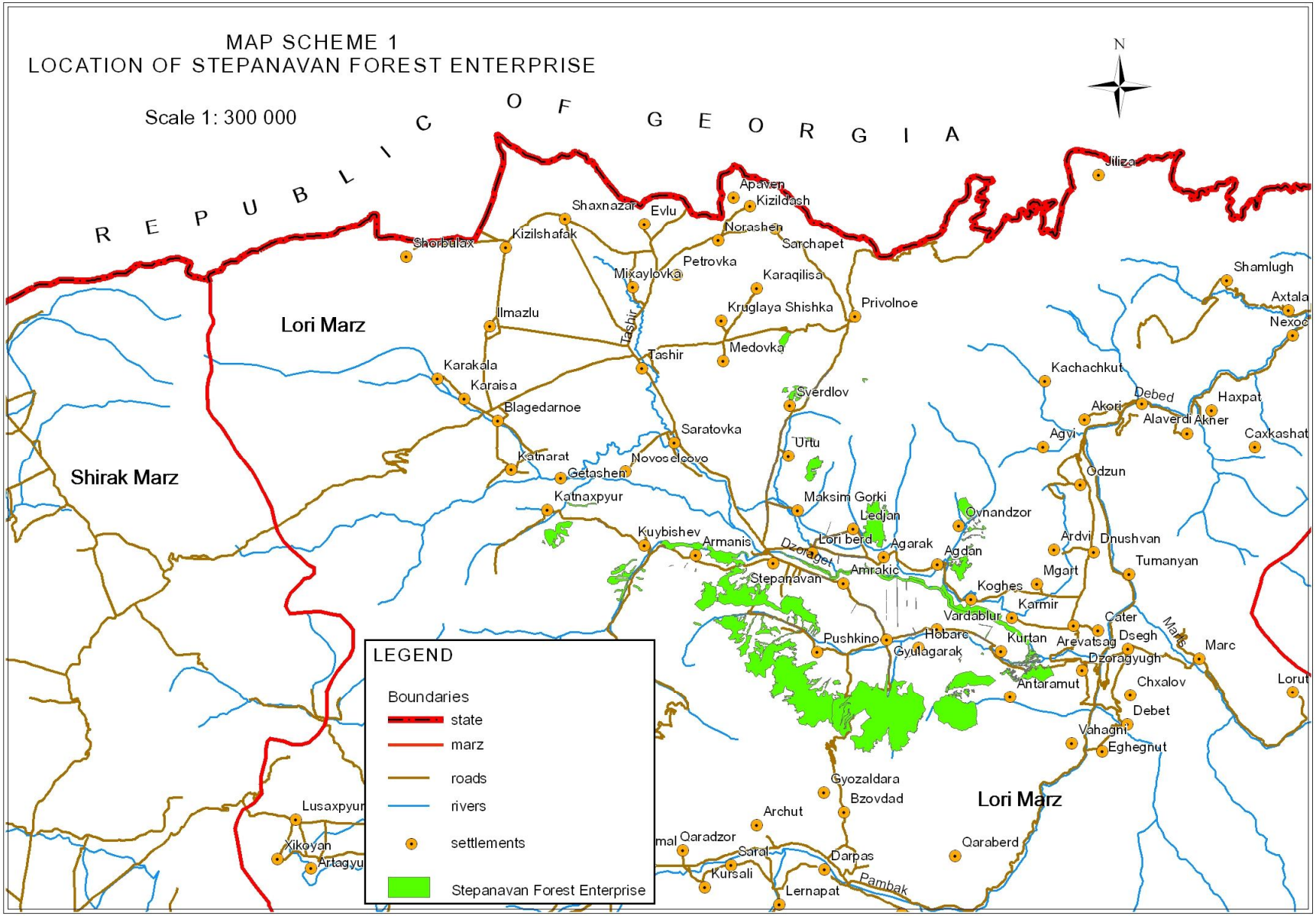
“Gyulagarak Pine” State Sanctuary was established by the Decree of the Council of Ministers of ArmSSR N 341, 13.09.1958, with an area of 2576 ha. The objective of establishment is the protection of relict pine (Pinus kochiana) forests. The Sanctuary is currently subordinated to Stepanavan Forest Enterprise of “Hayantar” SNCO of RA MoA.

Location of the Sanctuary

“Gyulagarak Pine” State Sanctuary is located on Northern slopes of Bazum Mountain Range surrounding Lori Mount from North, in Lori Marz of Northern Armenia. It is located in former Stepanavan Region of RA Lori Marz in the structure of Stepanavan Forest Enterprise of “Hayantar” SNCO, at the elevations ranging from 1400 to 1900 m. The Sanctuary is located in forest plot named “Mec Sochut”, at 4 km distance from Gyulagarak community.

The office of Stepanavan Forest Enterprise branch is located in Stepanavan city, at 140 km and 30 km distance from Yerevan and Vanadzor marz centre respectively. The forest enterprise is bordering with Tashir Forest Enterprise in the North, with Gugarq Forest Enterprise in the South, and with Lalvar Forest Enterprise in the East. The forest enterprise area extends 27 km from North to South and 32 km from East to West. (Map 1)

Map 1 Stepanavan Forest Enterprise of "Hayantar" SNCO



Status and Purpose of the Sanctuary

The Sanctuary has a status of State Sanctuary according to the RA Law on Specially Protected Nature Areas (2006). It meets the requirements of the International Union for Conservation of Nature (IUCN) IV category (protection through active management of species and their habitats).

The main objective of the Sanctuary is provision of conservation, protection, regeneration, reproduction and sustainable use of landscape and biological diversity of relict pine forests of Bazum Mountain Range in Northern Armenia. The main conservation object of the Sanctuary is *Pinus kochiana* forest, as well as species registered in the Red Book of Armenia, such as *Acer trautvetteri*, *Platanthera chlorantha*.

The main directions of Sanctuary development are use of recreational, ecotourism and resort potential of the area, organisation of relevant services, as well as coordination of complex measures on dissemination of information and eco-education..

Sanctuary Management Objectives

The Sanctuary management strategy is deriving from the main significance, goals and objectives of the area.

The **vision** of "Gyulagarak Pine" State Sanctuary is as follows: "Gyulagarak Pine" State Sanctuary will be well-known as a model of sustainably managed sanctuary in Armenia by 2020. The data from scientific researches and monitoring confirm improvement of the state of the main protection objects. The Sanctuary is protected and used for tourism purposes and visits in a sustainable manner, which increases the possibilities of its self-financing. It has provided employment possibilities for the local population and ensured high level of environmental awareness".

This vision considers area development priorities evaluated by significance, urgency and actuality. In order to achieve this vision, the management of the Sanctuary should be implemented in the following directions:

- Protection, use and rehabilitation of natural complexes/objects;
- Scientific-research activities and organisation of eco monitoring;
- Eco educational activities and public awareness raising;
- Development of cognitive and eco tourism;
- Conservation of historical-cultural heritage;
- Improvement of financial-economic operations;
- Enhancement of administrative-structural organisation;
- Increase of social-economic significance of the sanctuary.

Objectives and Functions of the Sanctuary

The objectives of the Sanctuary derive from the area development priorities. They were defined through analysis of current situation, assessment of obstacles/threats and are aimed at implementation of measures towards risk reduction and problem solving.

The main objectives of the Sanctuary are as follows:

- Correspondence of sanctuary management to its legal regime;
- Reliable protection of natural complexes of Caucasian pine and biodiversity;
- Organisation of research and monitoring of ecosystems;
- Prevention and alleviation of external harmful impacts within buffer zone, regulation of environmentally friendly economic activities, organisation of services and nature use;
- Implementation of measures aimed at increase of level of eco education and awareness among local population;
- Organisation of visits, scientific-cognitive and eco tourism;
- Protection of historical-cultural heritage;
- Provision of financial stability and specification of financial sources;
- Optimization of administrative-organisational structure and staff;
- Enhancement of staff professionalism;
- Integration with regional socio-economic development processes;

- Organisation of forest rehabilitation, forest protection and fire prevention activities;
- Prevention of natural hazards and alleviation of their consequences.

2. NATURAL CONDITIONS

Topography, Soil Characteristics

The Sanctuary is located on Northern slopes of Bazum Mountain Range, scaling down gradually and merging with mountainous valleys of Gargar and Kurtan. Genealogically, the area belongs to central zone of Small Caucasus, with the peak of 9 292 m (Urasar). The relief of the area is rugged, slopes with northern exposition and inclination of 20-30˚ dominate. Proportionate convex and stepped slopes of the relief are conditioned by arched and bending formations.

Grey forest and brown mountainous soils as well as mountainous dark soils are prevailing in the area. Mountainous, grey forest soils are characterized by low segregation of genealogical horizons, medium ingestion, low intenseness and absence of lime in their composition.

Brown mountainous soils are prevailing at the altitudes of up to 1700 m; they extent up to 2100m while on the slopes exposed to sun. These soils are characterised by low, in some areas by moderate segregation of horizons, high concentration of clay, moderate proportion of humus in the top layer, medium and higher level of ingestion, neutral or weak acid–base reaction.

Mountainous dark soils are characterized by clear segregation of genealogical horizons, cloddy structure, powerful profile and high proportion on humus in the upper layers. Major parts of soils have small volume, high porosity and moisture-resistance.

On the slopes of Southern exposition surface and linear wash are observed, causing more intensive erosion processes.

Climate

The climate of the region is affected by vertical zonation and varies as to the area altitude, exposition, distribution of forests and other microclimatic features. Climate is moderate, cool, with humid summers and cold winters. Moderate warmth and moderate cold are typical for the altitudes of 1300-1400 m and 1600-1700m above sea level respectively. In the sub-alpine zone (2100 m and more) mountainous cold climate is dominating.

The frost lasts 150-160 days; the mean annual precipitation is 650-700 mm (mostly in spring and first half of summer). Minimum temperature in January is recorded at -4°C for the lower parts and -12˚C in upper parts, minimum temperature is -34˚C. The average temperature in July is recorded at +17.2° C for the lower part, +10˚C for the upper part, maximum is +30˚C. Northern, North-western winds and valley breezes are pronounced.

The climate conditions of the region are favourable from the perspective of forest growing, as well as organisation of resort and recreational services.

Hydrology

The longest river of the region is Dzoraget, which is the stream of Debed (Qur basin). The total length of Debed is 178 km, with a catchment area of 4080 km^2. The River has significant hydro-energetic resources. Water is mainly used for irrigation and industrial purposes. There are several water pumps and arrangements for the biological cleaning of water installed on the River.

Dzoraget's major tributaries include Tashir, Hovnanadzor, Urut, Chqnagh and Gargar rivers. Dzoraget originates in the Eastern slopes of Javakhq Mountain, then flows through volcanic plateau of Lori forming 80-100 m deep canyon. The length is 57 km, basin area is 1460 km^2, the annual flow is 531 million m^3, average flow is 16,8 m^3/s, the flow module is 11,6 l/sec/km, height of flow layer is 365mm, flow index is 0,48. The river is replenished by underground waters and atmospheric precipitations. Lori Canal starts from Dzoraget. Dzoraget hydropower station and some stations of low capacity are built on the River.

The Sanctuary occupies "Qarhanqi Jur" River basin. The area is rich with fresh water springs.

Flora and Fauna

The Sanctuary area stands out for its rich biological diversity conditioned by strictly expressed vertical zonation, climate conditions and relief peculiarities.
The main forest forming species are beech, oak, hornbeam and pine. The accompanying species are ash, lime maple, mountain ash and others. They form mixed stands with beech and oak and occasionally also small clean stands. Natural pine stand of around 125 ha is also located within Gyulagarak Sanctuary, neighbouring the arboretum where 400 tree and bush species grow.
The most common shrubs are hawthorn (*Grataegus orientalis*), raspberry (Rubus), rose (*Rosa canina*), and rarely- euonymus (Euonymus gen.), dewberry (*Rubus caesius*), Cornelian cherry (*Cornus mas*). In the middle and upper forest zone wild apple and pear are frequently observed. From herbs *Campanula glomerata*, *Myosotis alpestris*, *Lotus caucasicus*, *Trifolium ambiguum*, *Elytrigia trichophora*, *Koeleria cristata* can be found. The plant species of the area registered in the Red Book of Armenia are listed below:

Table 1 Plant Species Registered in Red Book of RA

№	Name in Latin	Category
1	Acer trautvetteri	3
2	Atropa belladonna	3
3	Colchium szovitsii	3
4	Crocus adamii	3
5	Dactylorhiza cataonica	1
6	Dactylorhiza euxina	3
7	Dactylorhiza romana	3
8	Gladiolus caucasicus	3
9	Gladiolus italicus	3
10	Gladiolus kotschyanus	3
11	Gladiolus tenuis	3
12	Iris pumila	3
13	Iris reticulata	3
14	Juncus tenuis	2
15	Menyanthes trifoliata	2
16	Nymphaea alba	3
17	Orchis mascula	3
18	Platanthera chlorotha	3
19	Papaver paucifoliatum	3
20	Primula amoena	2
21	Rhododendron caucasicum	2
22	Traunsteinera sphaerica	2
23	Viola somchatica	3

From mammal species wolf, fox, rabbit, marten, hedgehog, squirrel and others are observed in the area, from birds Northern Goshawk, wild duck, partridge, quail, pecker and others are known. There are many insects in the area, such as grasshoppers, crickets, and others.

Forest Characteristics

The total forest covered area in the enterprise is 5674,9 ha (85, 4%), including 1231,6 ha forest cultures (21, 7%). Non-forest covered area is 298,3 ha (0, 5%), including 347,7 ha sparsely stocked areas, including 109 ha of anthropogenic origin and 238,7 ha of biological origin.
Total non-forest area is 280,5 ha (4, 2%), including 220,6 ha pastures. The small area of pastures is due to transferring these areas within the administrative boundaries of the communities to community ownership by respective RA Government Decrees.
The total area of the forests of protection significance comprises 49,9% of the total area (3325 ha), including 3208,8 ha (96.8%) forest lands, of which 2743,9 ha (82,8%) is forest covered including 952,9 ha forest cultures.

The lands of special significance occupy 3106.8 ha (46, 6%), including 2943,3 ha (95.1%) forest lands. The total forest covered area is 2710,6 (92%). The forests of production significance occupy 233,2 ha (3, 5%), including 220,4 ha (94, 8%) forest covered, 217,4 ha natural forests and 3ha forest cultures.

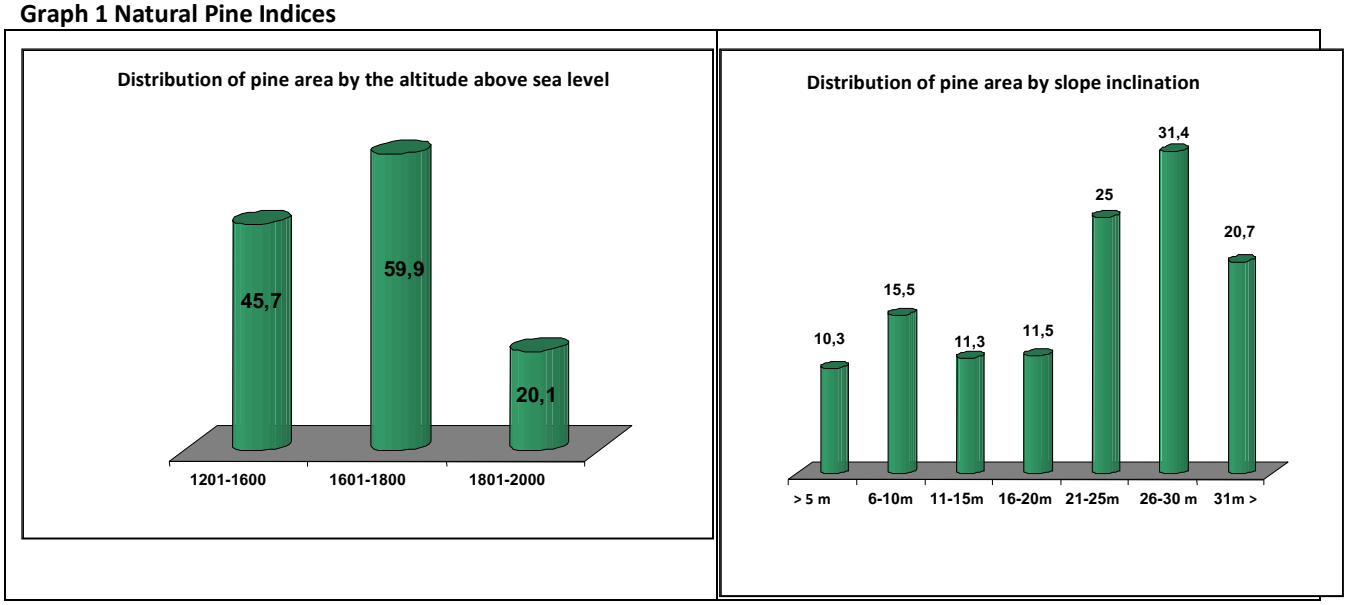
"Gyulagarak" State Sanctuary was established by the Decree of the Council of Ministers of ArmSSR N 341, 13.09.1958, with an area of 2576 ha. According to forest management planning data, the corrected area is 2722 ha, including 240,8 ha forest covered areas and 229,2 ha forest cultures. Non-forest covered areas is 113,6 ha, including 7,6 ha with non-closed canopy, 3,1 ha nursery, 16,7 ha cut and not regenerated areas, 91,7 ha forest glades and 44 ha sparsely populated areas, including 10,2 ha of anthropogenic and 28,8 ha of biological origin. Total non-forest area is 150,6 ha, including 141,9 ha pastures.

The average indices of Sanctuary area is the following; average age - 85, average site class - 3-4, average density 0,57, average volume per one ha forest covered area is 154 m^3, average annual increment per one ha is 1,81 m^3.

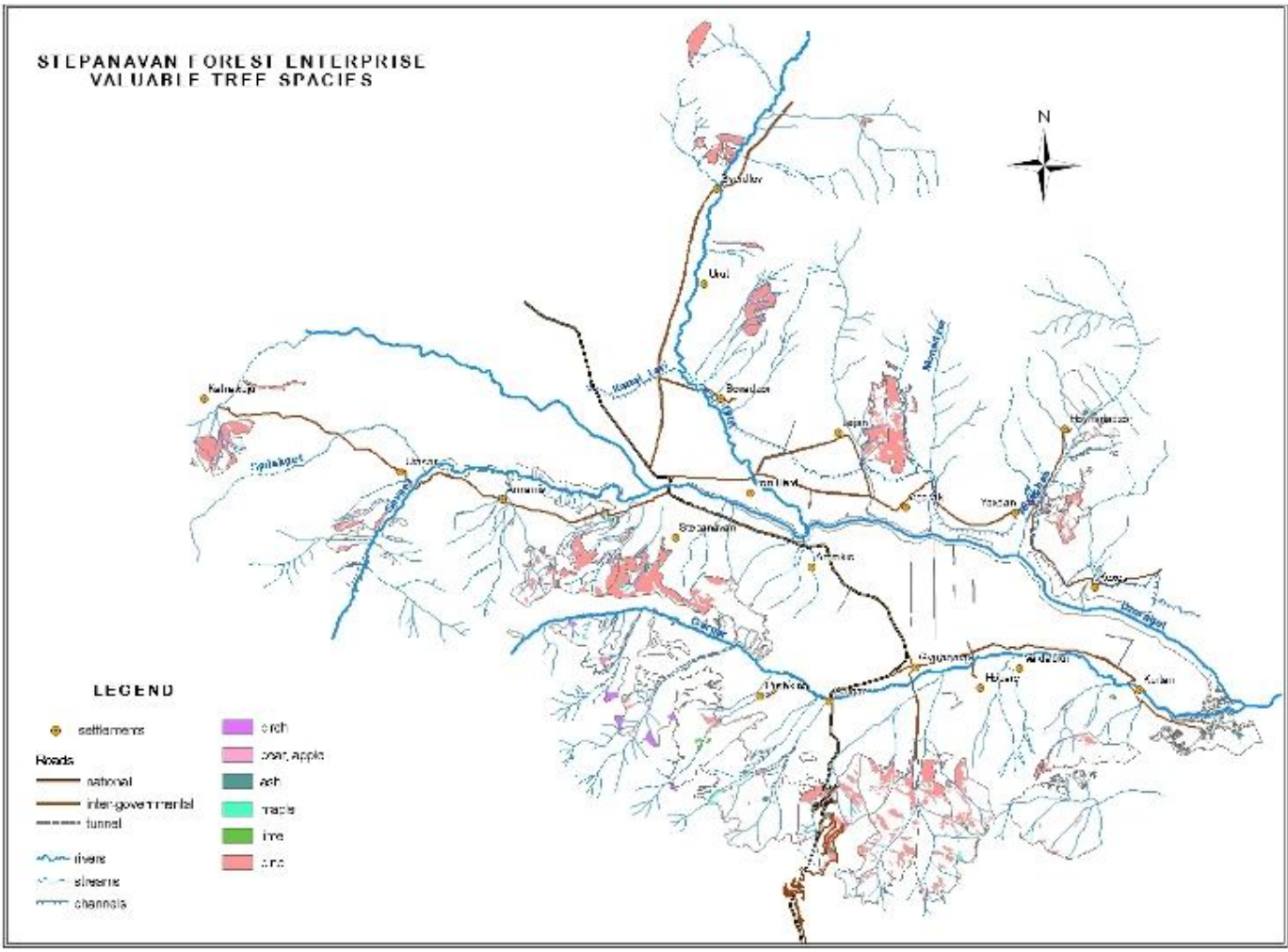
The forests of the Sanctuary have high conservation value, where, according to the Forest Stewardship Council (FSC), conservation and increase of environmental value of the forests is vital.

Environment protection, water-protection and anti-erosion functions of the forest are crucial for mountainous areas with rugged relief and located on steep slopes. The area occupied by natural pine stands within the Sanctuary area is 125,7ha, average age is 92, average site class is 3, 9, average density is 0,55, average volume per one ha forest covered area is 142 m^3.

Graph 1 Natural Pine Indices



Map 2. Valuable tree species in Stepanavan Forest Enterprise area


SILPANAVAN FOREST ENTERPRISE
VALUABLE TREE SPACIES
N
LEGEND
settlements
Roads
national
inter-governmental
tunnal
rivers
streams
channels
birch
oak, apple
ash
maple
lime
other

3. SOCIAL AND ECONOMIC CHARACTERISTICS OF LORI MARZ, ENVIRONMENTAL ISSUES

Social and Economic Characteristics of Lori Marz

Lori Marz takes up a total area of 3789 km^2 (12.6% of the total area of RA), population is 283 400, i.e. the population density is 74.8 km^2. The Marz is bordered by the Republic of Georgia (around 90 km) in the North, by Kotayk Marz in the South, by Tavush Marz in the East and by Aragatsotn Marz in the Southwest. The Marz has 113 rural communities,130 settlements and 8 towns.

Agricultural lands of Marz take up 251197, 8ha, including 42120, 3 ha arable land (12143 irrigated), 487,7ha plantations, 35679, 2 ha meadows, 145862, 4 ha pasture lands and 27048, 3ha other lands. Marz land balance is 378 873 ha, including 219331 ha (57, 9%) lands of state ownership with the following distribution: forests - 45.5%, pasture lands - 24.3%, arable lands - 1.6%. Lands owned by communities is 96496 ha (25,5%), including: pasture lands - 65,4%, meadows - 9,4%, arable lands - 7,4%. Lands owned by citizens and legal entities are 630 44.6 ha, including: arable lands - 51.2%, meadows - 32.2%, permanent plantations - 0.9%.

Before the beginning of 1990s the Marz was famous for its well-developed crop production, cattle breeding industry and processing mainly in former Stepanavan and Kalinino Regions, fruit production and grape making were well-developed in Shnogh and Tshotshkan sub-regions.

The current number of rural households is 32 542, which are involved in various spheres of agriculture and take part in the production and processing of agricultural and livestock farming products.

Lori Marz was the most developed industrial region, where gigantic industrial companies of the region were functioning. Presently there are 88 registered industrial companies and only some of them are functioning at low capacity.

Environmental Issues of Lori Marz

Around 19 communities, including Stepanavan city, are located within the forest adjacent zone of Stepanavan Region. The number of inhabitants is around 30 000, a half of which lives in Stepanavan city. Number of households is 8500. The region is completely gazified (with the exception of Katnaghbuyr, Koghes and Yaghdan communities). The annual demand for firewood is 20 000 solid m^3.

Some forest areas of Lori Marz were intensively destroyed during 1990-2000s. Illegal harvesting of firewood and construction-wood have opened up the forest covered slopes, resulting in the decrease of high value forest areas of seed origin and increase of tree-bush species of coppice and secondary origin. The climate-regulating, erosion control and water regulating significance of forests have decreased. Flows, landslides and erosion have become more active in the result of intensive forest cuttings.

Significant part of Marz lands have degraded due to non-cultivation. Non regulated garbage places containing outdated chemicals, accumulators, oil wastes, debris containing asbestos or other toxic and cancerogenic materials aside from household waste, cause considerable damage to agricultural lands. Toxic substances dissolve in surface and ground waters and threaten inhabitants and fauna using water resources of the area.

Around 1900 ha of Marz area is at landslide risk. Landslides have become more active in 18 settlements. They are more active on the slopes of 19 and higher inclination, where the balance of geological components is impaired. The reason for this are flowing surface and underground waters, airing of rocks or over-humidization, as well as earthquakes, human economic activities with no consideration of geological features of the area and forest cuttings. Landslides have continuously caused serious damage to households, infrastructures, vital objects, production capacities of 70 settlements located within the sliding zone and threatened the health of inhabitants and communication lines of the country and its neighbouring countries.

The existing water treatment stations (Spitak, Vanadzor, Alaverdi, Tumanyan) are in bad shape and actually do not function. The same is true for sewage removal pump lines. Due to the non-functioning of sewage treatment stations and depreciation of drainage system, industrial and household sewage flows to residential areas and rivers, pollutes the environment, disturbs the stability of ecosystems, resulting in insanitation and high risk of epidemic outbreaks.

Among large-scale industries, Chemical Factory of Vanadzor, CopperFactory of Alaverdi and Akhtala Ore-dressing and Processing Enterprise pollute the air basin of Marz. The current state of the use of mineral

resources is characterised as non-complex and wastefull utilization, with absence of waste-free industries, low level of public participation and awareness and other issues. Non-regulated construction and mining activities have resulted in land disturbance and lose of soil fertility.

The cases and volumes of non authorised cuttings have considerably decreased during 2001-2007, which is conditioned by gasification of major part of forest adjacent communities, structural and qualitative changes in the forestry sector and improvement of forest protection activities.

The distribution of forest lands within administrative boundaries of the communities is presented below.

Table 2 Forest Lands within Administrative Boundaries of the Communities

№	Name of the community	Total administrative area, ha	Forest Lands according to Cadastral Maps				
			Pasture lands	Meadows	Arable land	Other	Total
1	Agarak	1931.3	8.3	4.7	2.7	43.9	59.6
2	Amrakic	1214.8	5.1	-	8.0	13.5	26.6
3	Bovadzor	1163.6	2.2	-	-	0.6	2.8
4	Gargar	1457.8	9.9	0.1	1.9	5.2	17.1
5	Guylagarak	1552.1	3.0	1.4	13.9	23.0	41.3
6	Hobardzi	602.2	-	-	1.6	0.4	2.0
7	Hovnanadzor	869.8	36.5	9.2	-	1.7	47.4
8	Katnaghbyur	2799.1	3.7	4.6	1.1	5.9	15.3
9	Koghes	1219.0	17.9	-	0.1	26.0	44.0
10	Kurtan	1919.3	45.8	5.2	6.5	151.9	209.4
11	Lejan	1658.9	2.2	-	4.7	3.6	10.5
12	Pushkino	1807.8	83.9	56.9	11.1	63.9	215.8
13	Stepanavan	5307.9	64.7	5.2	16.7	158.8	245.4
14	Sverdlov	2872.9	2.8	2.0	4.9	5.5	15.2
15	Urasar	2319.5	20.4	8.5	21.5	3.1	53.5
16	Urut	2825.9	11.6	-	3.6	17.1	32.3
17	Vardablur	1528.4	-	4.7	3.6	55.4	63.7
18	Yaghdan	1148.3	1.3	0.4	-	26.8	28.5
19	Lori Berd	516.0	2.8	-	-	26.2	29.0
	Total	**34714.6**	**322.1**	**102.9**	**101.9**	**632.5**	**1159.4**

4. ADMINISTRATIVE/ OPERATIONAL PLAN

Administrative-territorial structure of the Sanctuary

The Sanctuary is bordering with forest areas of Stepanavan Forest Enterprise branch in the West and East, "Stepanavan" Arboretum in the North-East, Pushkino, Gargar, Gulagarak and Hobardzi community and privately owned lands in the North. The office of the Sanctuary is located in Stepanavan city of Lori Marz (office of Stepanavan Forest Enterprise branch).

"Gyulagarak Pine" State Sanctuary is in the structure of Stepanavan Forest Enterprise branch established in 1947 by the Order №9 of the Ministry of Forest Economy of ArmSSR, dated 27.10.1947, with Stepanavan, Gugarq and Privolnoe Forest Districts in its structure.

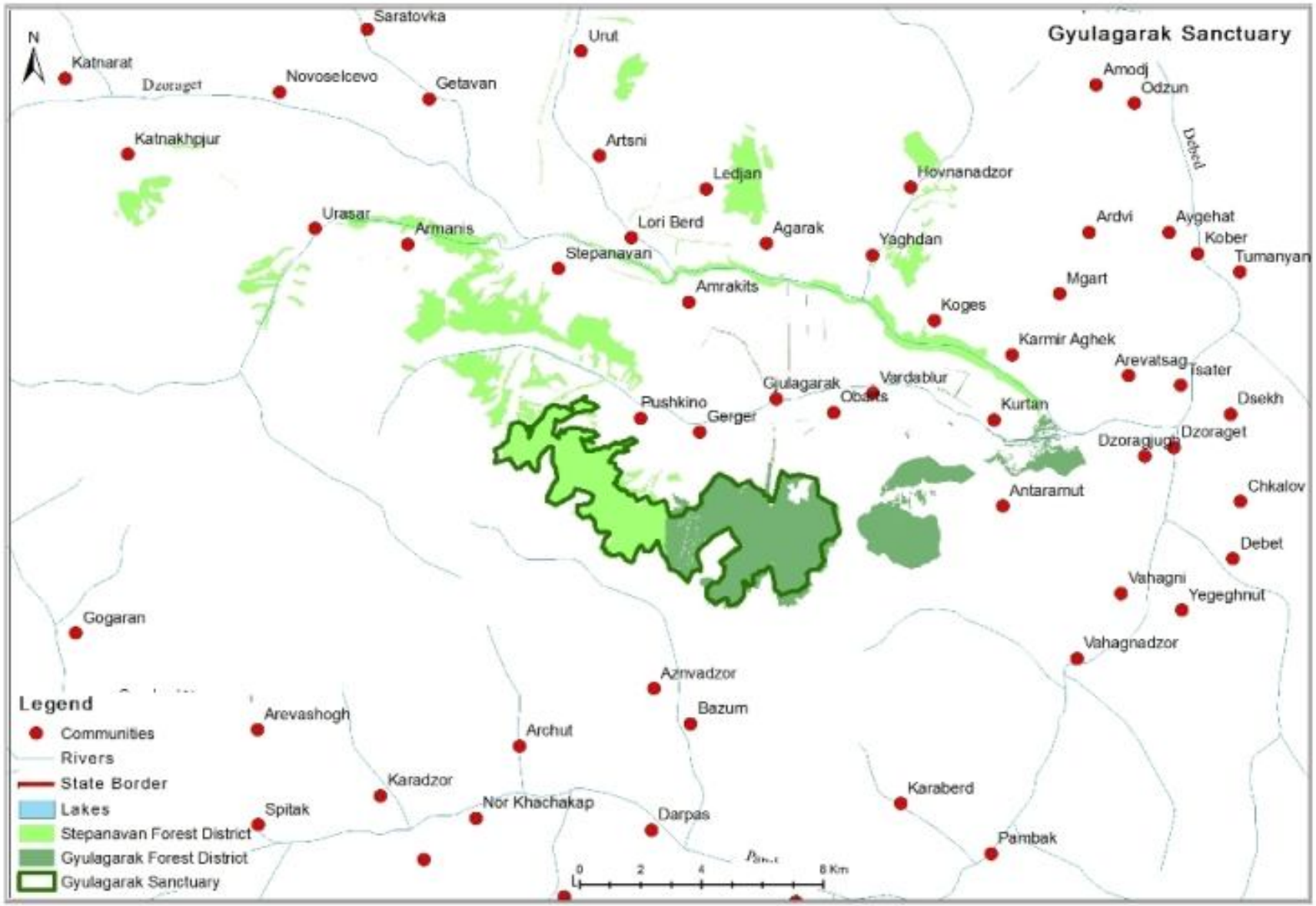
Presently, there are two forest districts in the structure of Stepanavan Forest Enterprise - Stepanavan and Gyulagarak. The total forest enterprise area is 6665 ha (9293 ha according to previous FMP). Lalvar Forest Enterprise was formerly included in the structure of Stepanavan forest enterprise as a separate forest district.

Table 3. Current Structure of Stepanavan Forest Enterprise

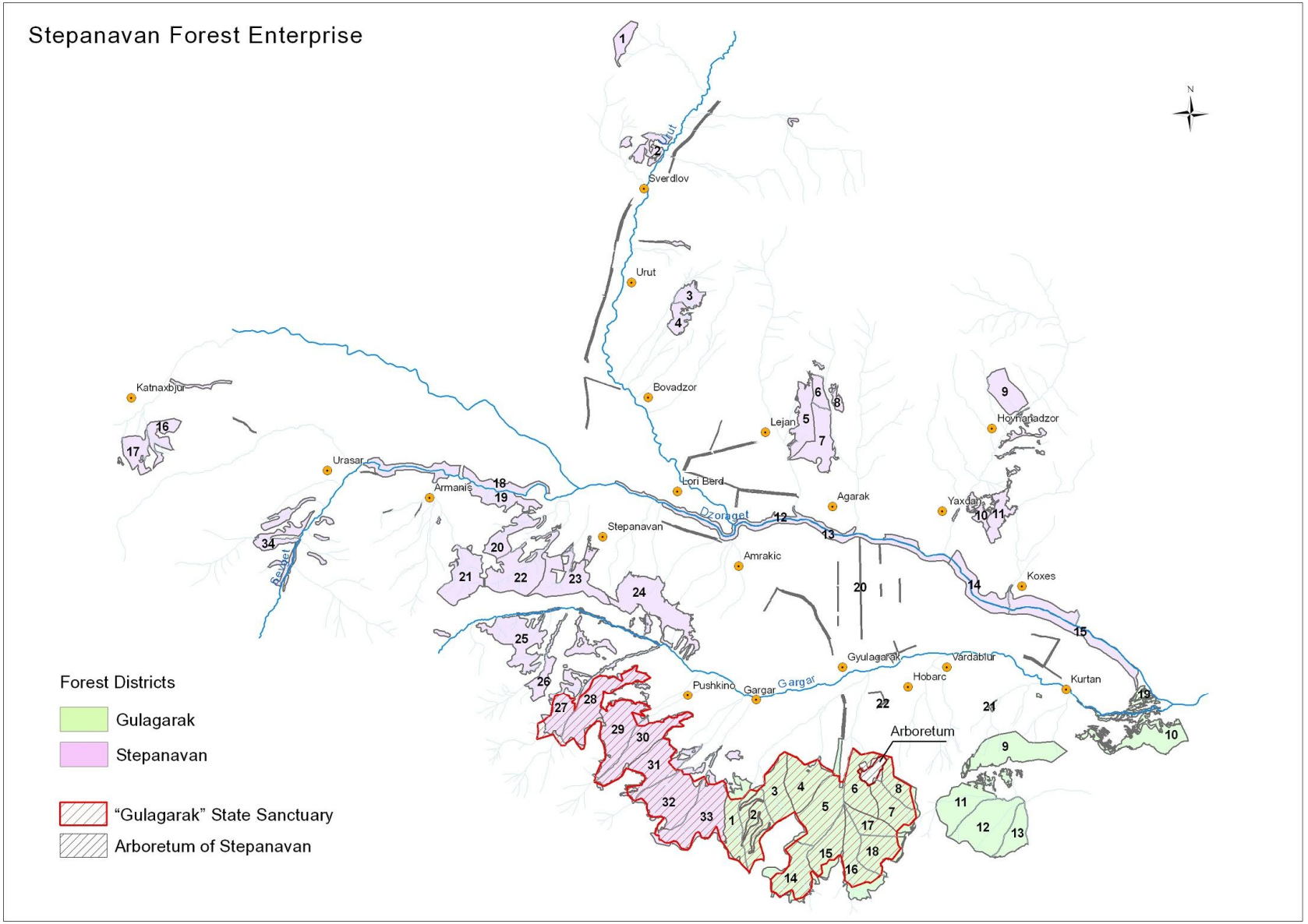
№	Forest District	Year			
		1992		2009	
		Area in ha	%	Area in ha	%
1	Lalvar	2293	24.6	-	-
2	Stepanavan	4341	46.8	4121.3	61.8
3	Gyulagarak	2659	28.6	2543.7	38.2
Total		**9293**	**100**	**6665**	**100**

The area of "Gyulagarak Pine" State Sanctuary includes Forest Blocks № 27-33 of Stepanavan Forest District, 1-8 and 14-18 of Gyulagarak Forest District. The area of the Sanctuary is 2722 ha, according to the FMP of Stepanavan Forest Enterprise from 2009, while according to the Decree of the Council of Ministers of ArmSSR N 341, dated 13.09.1958, it was 2576ha.

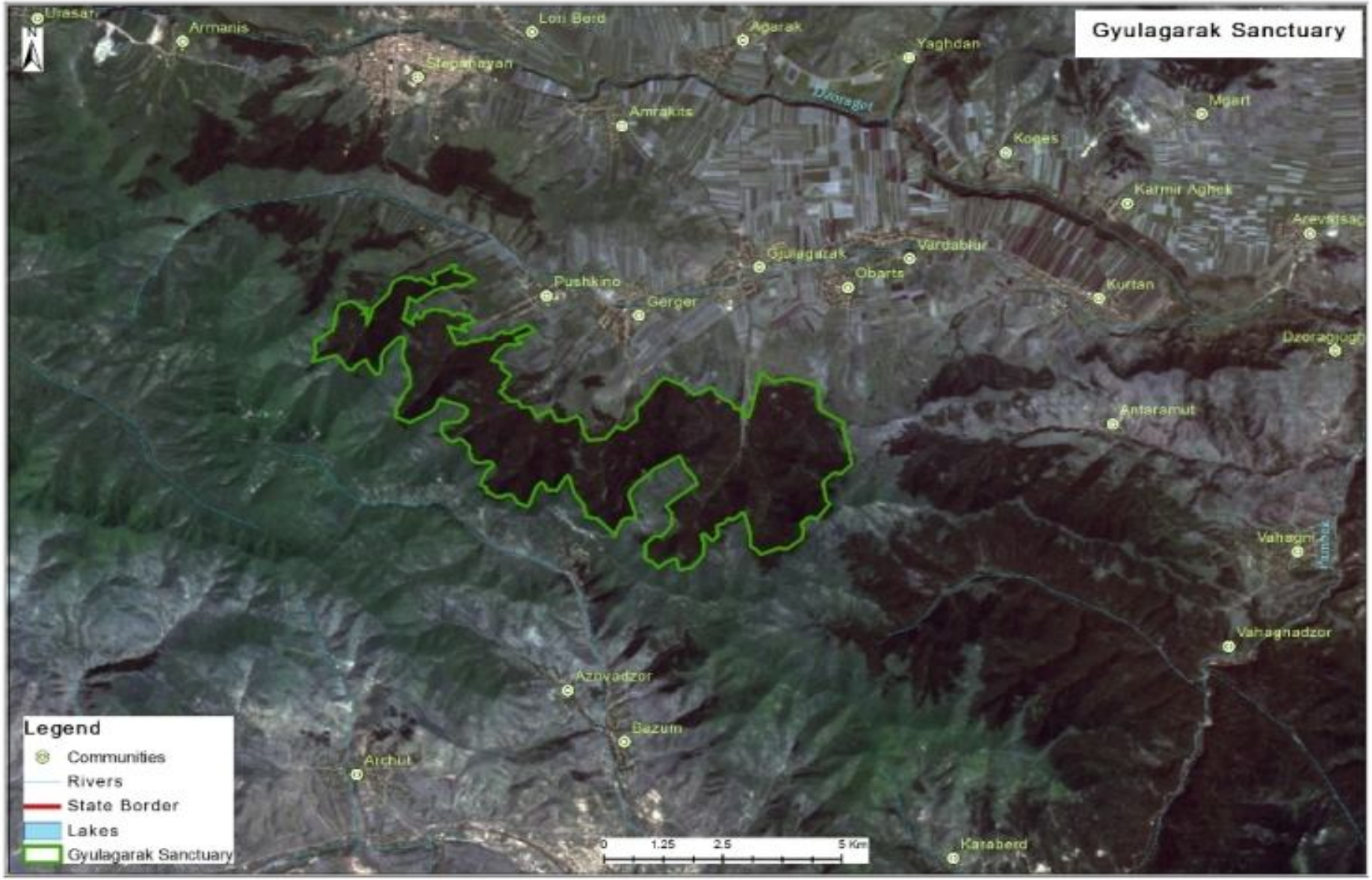
Map 3. Boundaries of "Gyulagarak Pine" State Sanctuary



Map 4. Boundaries of "Gyulagarak Pine" State Sanctuary on the Forest Enterprise Map



Map 5. Boundaries of "Gyulagarak Pine" State Sanctuary on the Satellite Image



Financial Activities of the Sanctuary

The expenses necessary for implementation of activities envisaged in the Charter are not considered in the funds of forest enterprise. There is no staff, as well as main assets specially assigned for the Sanctuary.
The costs of the forest enterprise activities during 2006 and 2007 made up 51 661 thousand and 61 491 thousand Drams respectively, including forest-economic activities - 1968 thousand and 2676 thousand, sylvicultural operations - 19034 thousand and 24398 thousand and forest enterprise maintenance costs - 29955 thousand and 33697 thousand Drams.
The total income from forest was 7074 thousand and 6986 thousand Drams for the years 2006 and 2007 respectively with the following proportion: timber production - 6683 thousand and 6493 thousand Drams, non wood forest products - 391 thousand and 493 thousand drams. Financing from the state budget was 52726 thousand and 54331 thousand Drams for the years 2006 and 2007 respectively.

Table 4. Staff List of Stepanavan Forest Enterprise branch, as of 2008

№	Title	Unit	Salary, AMD	Annual Salary Fund (thousand Dram)
1	Director	1	120000	1440
2	Senior forester	1	80000	960
3	Deputy director (conservation)	1	75000	900
4	Accountant	1	70000	840
5	Operator	1	40000	480
6	Engineer of Forest Cultures	1	55000	660
7	Forest Conservation Engineer	1	65000	780
8	Nursery engineer (technician)	1	55000	660
9	Hunting specialist, inspector	1	35000	420
10	Head of forest District, total	2	70000	1680
11	Forest Guards, total	25	52000	15600
12	Cleaner	1	25000	300
13	Guard	3	25000	900
14	Driver	1	35000	420
15	Inspector	1	50000	600
16	Mechanician	1	25000	300
	TOTAL	**43**		**26940**

Table 5. Assets of the Forest Enterprise

Name	Gross book value	Amortization	Book value
Office building	4512101,00	652252,78	3859848,22
Fence	6182091,00		6182091,00
Fence	2368912,50		2368912,50
Cabinet	37541,00	6256,80	31284,20
Cabinet	37541,00	6256,80	31284,20
Table for director	44160,00	7360,00	36800,00
Total	**23356526,45**	**2345977,13**	**21010549,32**

Enhancement of Administrative-Organisational Activities

The activities envisaged in the management plan aimed at the enhancement of administrative-organisational activities should address the following issues:

- Assessment of activities, strengths and weaknesses;
- Obstacles for implementation of activities;
- Structural units (plots, land parcels, etc.);
- Management authorities (subordination, departments, staff, etc.);
- Human and technical resources, infrastructures.

Financial Stability Program for the Sanctuary

The activities envisaged in the management plan aimed at the financial stability of the Sanctuary should review, consider and address the following issues:

- Volumes and sources of financing;
- Structure of incomes/expenses;
- Level of financing of high priority activities;
- Results of financial audits and future progress;
- Possibilities of extra-budgetary funds and investments;
- Activities directed at the efficiency enhancement.

5. PROTECTION PROGRAM

Sanctuary protection issues and priorities

Non-sufficient attention is currently paid to the adherence of protection regime and management issues of "Gyulagarak" State Sanctuary. The forest ecosystem has degraded and self-regeneration capacity of the main symbiosis has destroyed due to intensive forest use in some areas of community adjacent forests during 1992 and following years.

There are many inconsistencies by type of use in non forest lands (arable land, meadow, pastureland, permanent plantations), such as registration of areas with no road access as pastureland or areas on steep slopes as arable land.

There is a necessity to make corrections in land categories and land types and register these changes in respective authorities.

Treeless areas of 1-3 ha were classified as pastures, if they are considerably distant from the roads. Areas adjacent to community pastures were classified as meadowlands, and arid and non-fertile areas inside the forests like small glades - as arable lands. Meadows and pastures can also provide some income as a type of non wood forest use, if they are well managed. The important factor to be considered is that cattle should not be allowed to enter the areas to be regenerated. This means that the pastures should be far from these areas, and the activities in the meadows, which are mainly glades, should not negatively affect the natural (seed) regeneration of forests.

In order to prevent the sliding of the upper tree line, the forest belt with the width of 200 m on the upper timberline (irrespective of the land use type) is considered as forbidden zone for agriculture.

In order to improve the state of the forests and increase their productivity, it is necessary to pay more attention to the quality of the sanitary and maintenance cuttings in the forest stands.

Protection program

The activities envisaged in the management plan aimed at conservation of the Sanctuary should address the following issues:

- Detection and prevention of activities violating the Sanctuary regime (including buffer zone);
- Promotion of permitted types of nature use;
- Support to conservation of natural condition of ecosystems, rehabilitation of natural systems and objects;
- Protection of cultural landscapes and ecotourism routes;
- Organisation of fire control and forest protection measures;
- Measures, aimed at prevention and alleviation of natural hazards;
- Elimination or reduction of human negative impacts;
- Enhancement of protection, capacity building;
- Development of protection infrastructures;
- Development of mechanism for the provision of operative information.

6. BIODIVERSITY MONITORING AND SCIENTIFIC RESEARCH PROGRAM

Biodiversity monitoring (BDM)

Biodiversity monitoring in the Sanctuary, its purpose and objectives

The activities envisaged in the management plan aimed at monitoring of the Sanctuary should address the following issues:

- Previous BDMs and assessment of results (staff, financial and technical resources, data bank, etc.);
- Preparation/review of monitoring protocols (format, methods, selection of observation network, etc.);
- Selection/review of indicators at species, population and ecosystem levels;
- Activities, stages and timetable of the development/introduction of BDM system;
- Scientific researches necessary for the enhancement of monitoring system;
- Introduction/modernisation of database maintenance system and provision of information.

Scientific research

Analysis of the current state of scientific research

Scientific justification of the activities completed in the spheres of conservation, monitoring, eco education and organization of recreation

The activities envisaged in the management plan aimed at carrying out scientific researches in the Sanctuary should address the following issues:

- Long term plan for scientific researches by priorities, including research fields, terms, methods and implementers;
- Program for introduction/development of geographic information system and other modern technologies;
- List of published monographs and other scientific papers;
- Measures aimed at development of facilities and equipment for scientific researches;
- Program for establishment/enhancement of field scientific observatories;
- Cooperation among Sanctuary and scientific, environmental entities;
- Staff training and retraining activities.

7. ECOTOURISM AND RECREATION DEVELOPMENT PROGRAM

Eco Tourism Potential of the Area

Historical-cultural and natural monuments, landscape diversity, favourable climate and rich biological diversity are essential preconditions for recreational activities of the Sanctuary and development of ecotourism.

Forest areas surrounding the Sanctuary are unique corners of nature in Armenia and stand out for their rocky slopes and trapezium-shaped tops, deep ravines and creeks, mountainous-forest landscapes.

The region is rich with historical-cultural and nature monuments, listed below:

- Lore fortress, XI century, 3 km towards Northeast from Stepanavan
- Ruined Church of Gyulagarak, VI-VII centuries, nearby Gyulagarak village
- "Darmantagh" village place, X-XIII centuries, nearby Agarak village
- Jgrashen Church, VI-VII centuries, nearby Vardablur village
- St. Gevorg Church, VI century, Sverdlov village
- Dorbant Monastery, VI century, 3 km towards North from Sverdlov village
- Hnevanq, VII-XIII centuries, Monasterial Complex, 3 km towards East from Kurtan village, on the right riverside of Dzoraget

The presence of complex of relict Lakes (Kuybishevo, Saratovka, Novoselcovka) and Caucasian Rhododendron (Pushkin pass) is important.

Provision of complex resort and recreation services is prospective for the area in focus due to mild climate and presence of cold springs.

Eco tourism requirements

The negative impacts of tourism on environment are related to the area peculiarities, intensity of use for tourism purposes and tourism management capacities. The following requirements apply for organisation of ecotourism (scientific-cognitive excursions):

- Visits, their quantity and duration shall be determined and monitored by the Sanctuary staff;
- The Sanctuary staff shall be responsible for organizing ecotourism and enforcement of environmental norms;
- Only those types of tourism shall be permitted, that are in line with the objectives, defined in the charter;
- Ecotourism service shall be based on the principle of exclusion of negative impacts on natural landscapes;
- Ecotourism advertising shall be solely based on the description of natural and cultural values and their conservation ideology;
- Accumulation of polluters and wastes shall be forbidden.

Ecotourism trails

Description of eco trails, their duration, visitors' groups, requirements for physical fitness, allowed load, arrangement of infrastructures and necessary means for the provision of information shall be defined for ecotourism trails. Specialised types of ecotourism are defined as well, such as for the purpose of observation of flora and fauna, geo-ecological, archaeological, architectural, demographic, cultural and other types.

Ecotourism and recreation infrastructures

In order to organise ecotourism in an efficient manner, service infrastructures should be established (visitor centre, accommodation, food sale points, observation points, pavilions, roads, paths, information network, provision of domestic services and removal of garbage, barriers, stops, passages, posters etc.), provision of which should be continuous. Infrastructures should be planned, established and maintained in line with the natural and cultural environment, be limited, of small volume and outside Sanctuary boundaries (when possible) with the exception of those planned to be established on eco tourism trails.

Program for organisation of ecotourism and recreation

The responsibilities of respective subdivisions of the Sanctuary should be clearly defined in the ecotourism program. The main objectives are provision of high-standard services, assessment of visitors needs, provision of security, management of ecotourism and recreational resources, provision of information related to ecotourism, cooperation among service providers of the area and individuals.

Special courses and study tours should be included in the ecotourism program in order to train staff and prepare highly qualified guides. Tourist equipment and uniform (binoculars, horses, saddles, tents, sleeping bags, field equipment, searching equipment, equipment for first aid and rescue activities, means of radio communication, first-aid kit, ropes, other first aid and rescue equipment) should be available for the organization of ecotourism.

Relevant information material and information infrastructure (information provided at visitor centres, museum pieces, regulating posters, exhibition halls, posters, printed material, brochures, and regulations) should be developed in order to achieve visitors' awareness and relevant behaviour. Relevant information should be placed along the proposed routes, as well as close to historical-cultural and nature monuments (mainly direction signs, regulating posters or banners).

8. ECO EDUCATION AND AWARENESS

The main directions of education and awareness are defined considering the status of the Sanctuary, natural and social-economic conditions, historical-cultural features, peculiarities of conservation and utilization regime and current state. It is necessary to assess the activities within the Sanctuary focusing education and awareness. These activities should be carried out with main groups and stakeholders, including visitors, schoolchildren, inhabitants of Sanctuary adjacent communities, pedagogues of the region, educational institutions and others. The mechanisms for the provision of information and capacities need to be enhanced.

Education and awareness activities should be implemented in the following directions:

1. Enhancement of activities of museums, visitor centres and exhibitions
   - Establishment/modernisation of museums and visitor centres;
   - Preparation, installation and maintenance of thematic exhibitions and expositions;
   - Preparation of mobile exhibitions and expositions, their modernisation and definition of periodicity of installation in most visited areas.
2. Work with mass media
   - Preparation of press releases;
   - Speeches over radio and television;
   - Publication of periodicals;
   - Preparation and maintenance of web sites;
   - Placing information in other websites;
   - Organisation of cooperation with journalists.
3. Advertising and publishing activities
   - Publication of booklets, photo albums, calendars, information and cartographic materials, CDs and other informative materials, preparation of medals and souvenirs;
   - Film and movie production.
4. Work with schoolchildren
   - Organisation of eco camps and field trips;
   - Formation of groups of young naturalists and initiation of activities;
   - Implementation of thematic trainings, field work and field trips together with schoolchildren;
   - Organisation of competitions, quizzes, olympiads and conferences;
   - Involvement of schoolchildren in ecological celebrations and actions.
5. Cooperation with pedagogues and educational institutions
   - Organisation and implementation of thematic seminars and methodological consultations for teachers (firstly for the teachers of biology, ecology, geography, etc.);
   - Participation in the organisation and implementation of professional qualification courses for teachers;
   - Provision of information, video material (photos, posters, video films, etc.) and literature on the conservation of biological and landscape diversity and Sanctuaries to schools;
   - Organisation of professional activities devoted to environmental holidays and actions (March of Parks, Sanctuary Staff Day, World Environment Day, Forest Day, Birds day, etc.).

9. ACTIVITY PLAN

The activities listed are planned for 5-year period and include activities, focusing on the enhancement of various spheres related to the Sanctuary.

№	Activity	Time-frame	Implementer	Source of financing
1.	**Development of draft legal acts**			
1.1	Development of charter and its compliance with RA legislation			State budget
1.2	Development of permitted economic activities and criteria within buffer zone of the Sanctuary			
1.3	Definition of staff, number of staff members and requirements			
1.4	Preparation of proposals on the topics for scientific-research activities and their approval			
1.5	Preparation of financial stability plan			
1.6	Mapping and demarcation of areas			
1.7	Preparation of program for development/introduction of biodiversity monitoring system (including activities, stages, timetable, etc.)			
2.	**Structural reforms**			
2.1	Staff recruitment (director and other necessary staff members)			
2.2	Establishment of ecotourism management department			
2.3	Establishment of scientific and monitoring department			
3.	**Capacity building, increase of professional quality of the staff and technical re-equipment**			
3.1	Staff training, re-training (biodiversity monitoring, conservation, ecotourism, etc.)			International funding
3.2	Technical provision for staff (off-road vehicles, horses, field uniform and equipment)			
3.3				
4.	**Enhancement of Sanctuary protection**			
4.1	Establishment of necessary infrastructures for protection (barriers, guard houses, fencing, etc.)			
4.2	Rehabilitation of natural systems and objects			
4.3				
4.4				
5.	**Implementation of scientific researches and monitoring of biological diversity**			
5.1	Preparation/review of monitoring protocols (format, methods, selection of observation grid, etc.)			
5.2	Introduction/modernisation of the system for database maintenance and provision of information			
5.3	Introduction/ development of geographic information and other modern technologies			
5.4	Establishment/enhancement of field scientific observation points			
5.5				
6.	**Development of ecotourism and recreation**			
6.1	Establishment of recreation and ecotourism infrastructures (information centres, boards, pavilions, paths, etc.)			
6.2	Planning of ecotourism trails			
6.3	Technical provision for ecotourism and recreation			
6.4				
6.5				
7.	**Enhancement of eco education and awareness**			
7.1	Preparation of thematic exhibitions and expositions, installation and maintenance			
7.2	Preparation and maintenance of web sites			
7.3	Implementation of thematic trainings, field work and tours with schoolchildren			
7.4				
7.5				

10. MONITORING AND EVALUATION OF MANAGEMENT PLAN

In order to assess the process of implementation of the management plan, the following criteria should apply;

- In which stage of implementation the management plan currently is?
- In which stage of implementation the management plan had to be?
- What is needed for the implementation?
- What should be done to improve the situation?

The activity plan of the management plan should apply criteria for the evaluation of management plan effectiveness for each activity. The monitoring and evaluation of the management plan against the criteria can be implemented by the protected area staff (self evaluation), independent audit entity, independent experts or others. The authorised body makes respective decisions to eliminate the shortcomings revealed in the result of monitoring and evaluation of the management plan.

REFERENCES

ANNEXES