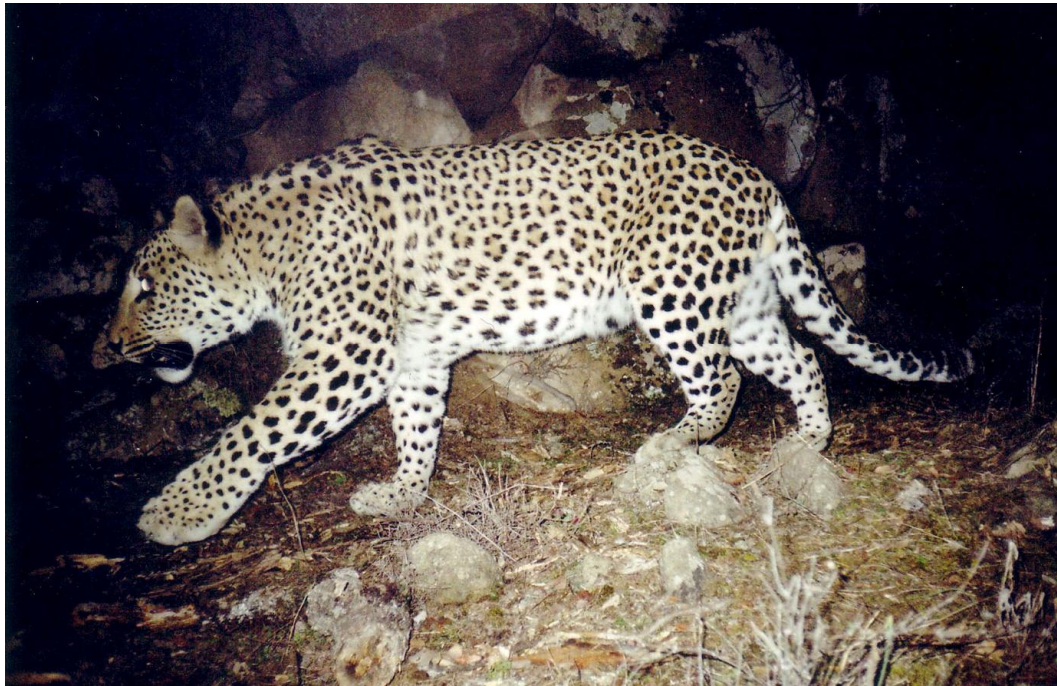


NATIONAL ACTION PLAN FOR LEOPARD (*Panthera pardus*) CONSERVATION IN ARMENIA



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Abbreviations:

CEPF – Critical Ecosystem Partnership Fund
GIS – Geographical Information System
IUCN – International Union for Conservation of Nature
NAS – National Academy of Sciences
NGO – non-governmental organization
PA – protected area
RA – Republic of Armenia
WWF – World Wide Fund for Nature

I. INTRODUCTION

1.1 Structure of the National Action Plan

The leopard is teetering on the brink of extinction in Armenia, surviving only in the least accessible cliffy habitats of southern Armenia. Until the early 1970s it lived also in the north-eastern parts of Armenia where it later vanished. Nowadays, the leopard population size numbers no more than 10-15 individuals.

Retention of the leopard within the Armenian fauna demands for implementation of urgent and efficient measures. It is justified by that this predator has been the focal species in the entire Caucasus. In other words, the leopard is an umbrella species (being atop the ecological niches, it safeguards the existence of all biodiversity) and a flagship species (beautiful and recognizable, it captures the attention of local people, governments and international cooperation).

Conservation of the leopard and other species inevitably entails conflicts with local communities and other stakeholders. From this standpoint, efficient and timely implementation of the Strategy for Leopard Conservation in the Caucasus Ecoregion and the National Action Plan for Leopard Conservation in Armenia represents a guarantee of saving the leopard from imminent extinction in the country.

This document consists of the following parts:

- Justification
- Procedures and partners of the National Action Plan
- Leopard distribution, ecology and current status
- Scientific research
- Conservation
- Analysis of problems and favourable conditions
- Vision
- Goal
- Objectives
- Activities
- Official approval and follow-up
- Institutional capacities
- Financial support
- List of references

The appendices include the National Action Plan for Leopard Conservation in Armenia and the list of workshop participants.

1.2 Justification

The RA Government has ratified the following documents:

- Convention on Biological Diversity (1993)
- National Action Plan on Nature Conservation (1998)
- Strategy and National Action Plan for Development of Protected Areas (2002).

The favourable legislative basis that was recently shaped in the RA includes the following laws:

- Law on fauna. Valid from 12 May, 2000.
- Law on hunting and game management. Valid from 2 June, 2007.
- Law on specially protected natural areas. Valid from 4 January, 2007.
- Law on rates of compensation of the damage inflicted to flora and fauna by violation of nature conservation. Valid from 18 June, 2005.

Moreover, the Ministry of Nature Protection of the RA has approved a number of regional documents:

- Ecoregional Conservation Plan (2005) in which the leopard is ranked a focal (umbrella and flagship) species in the Caucasus
- Strategy for Leopard Conservation in the Caucasus Ecoregion (2007).

Urgency of measures to be taken to save the leopard from disappearance in Armenia has been dictated by the following reasons:

1. The leopard is endangered both nationally and internationally:
 - The leopard is listed in the 1987 Red Data Book of Armenia as “endangered”
 - According to the assessment report prepared for the new edition of the Red Data Book of the RA, the leopard in the country should be given the status “critically endangered”
 - In the 2008 and earlier editions of the IUCN Red List of Threatened Species the leopard in Armenia and the Caucasus in general is classified as “endangered” [(EN C2a(i)).
2. Contemporary range of the leopard in Armenia includes only two important PAs (Khosrov Forest and Shikahogh reserves) and its overwhelming part is spread over the unprotected lands.
3. The leopard is permanently present only within the **two areas** (central and eastern Khosrov Reserve and eastern Meghri Ridge) which are located in the extreme north-west and south-east of the national range, respectively, and are isolated from each other by a network of narrow and interwoven corridors. Such a pattern makes the leopard population entirely dependent upon the functioning of corridors. Given the high level of range fragmentation, the most efficient way to preserve this predator would be the incorporation of prey-rich habitats into the network of large (reserves and national parks) and small (sanctuaries) PAs.
4. Today’s leopard range in Armenia is concentrated on the Zangezur Ridge which is extended along the Armenian-Azerbaijani (Nakhichevan) state border and where the leopard lives only temporarily.
5. Economic growth, particularly intensification of mining and road construction, leads to reduction of habitat quality and degradation of leopard and its prey populations.
6. Leopard existence has been challenged by many threats (item 2.4).

1.3 Procedures and partners of the National Action Plan

The National Action Plan for Leopard Conservation in Armenia is based on, and follows, the Strategy for Leopard Conservation in the Caucasus Ecoregion which was

approved by the Ministry of Nature Protection of the RA (letter №2-04/166 dated 25 July, 2008).

This draft was prepared by WWF Armenia within the project “Leopard conservation in the Caucasus Ecoregion” under financial support provided by WWF Switzerland. Preparatory stage comprised a number of workshops and roundtables for WWF staff and other stakeholders (September 23, October 17, October 31, November 14 in 2008).

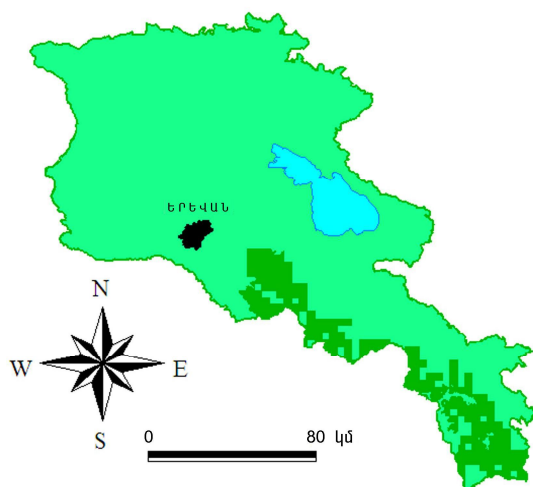
On 4 December, 2008, at the Aarhus Centre in Yerevan the workshop was held on discussion of the draft National Action Plan. The list of participants of this and the earlier meetings is presented in the Appendix 2.

II. GENERAL INFORMATION

2.1 Leopard distribution, ecology and current status

The Caucasian leopard (*Panthera pardus ciscaucasica*), also known as the Persian leopard (*P. p. saxicolor*), has been the rarest mammal of the Armenian fauna apart from the Pallas’ cat (*Otocolobus manul*) and the striped hyena (*Hyaena hyaena*). Existence of the Pallas’ cat and the hyena, last time recorded in Armenia in 1935 and the late 1940s, respectively, is neither confirmed nor fully refuted. The leopard is definitely living in Armenia, but faces imminent extinction because of meager numbers.

In 1972 the leopard was declared a protected species and included to the 1987 Red Data Book of Armenia as “endangered”. In 2008 and earlier editions of the IUCN Red List of Threatened Species it is listed as the Persian leopard of “endangered” [(EN C2a(i)] status. In the last assessment report (April 2008, 2008 IUCN Red List of Threatened Species) it is classified under the same name as “endangered” [EN2a(i)] and “decreasing”. Now, according to the IUCN criteria the leopard in Armenia should be reclassified as “critically endangered” [CR C2a(i) + D]. The Caucasian and Persian leopards are the same animals, but the former name was introduced in scientific literature earlier and has a priority over the latter one.



The leopard range in Armenia

The first records of leopards in Armenia began to come much later than elsewhere in the Caucasus, only in the late 1930s. Almost all information, mostly as trophies, arrived from the area which in 1958 was set aside as Khosrov Forest Reserve. Gleanings about leopard killings also used to come from the Zangezur Ridge. Until the early 1970s leopards also lived in north-eastern Armenia, but later were wiped out from there.

In Armenia and the whole Caucasus the leopard exists from the late Pliocene-early Pleistocene (170,000-300,000 years ago) when it penetrated from Africa to the Middle East. The rock carvings depicting men's hunts on leopards and dated the late Stone Age (5,000-4,000 B.C.) and the first half of the Bronze Age (3,000-2,000 B.C.) are found on the Geghama Ridge and in the Siunik Province of southern Armenia.

At present, the leopard inhabits south-western and southern Armenia from central and eastern Khosrov Forest Reserve (Khosrov and Khachadzor districts) southwards to the Armenian-Iranian state border within the Geghama, Zangezur, Vayk, Bargushat and Meghri ridges. The range boundaries are stretched along the Azat River in the north-west, Vardenis Ridge in the north, semi-desert of the Ararat Valley in the west, Azerbaijani border and nival belt in the west and east, and the Arax River along the Armenian-Iranian border in the south.

The maximum possible size of the leopard population in Armenia is 10-15 individuals, including adults, sub-adults and cubs. The population is breeding and makes only 0.008-0.01% of global population of this subspecies (up to 1300 individuals). So, the leopard in Armenia is a marginal taxon.

In Armenia, as well as in other areas of the Middle East, the most imminent threat to leopard survival is ever-increasing fragmentation of populations into the isolated and often too small patches of sub-populations. Prey reduction caused by poaching, infrastructure development, disturbance and habitat loss (plant gathering, livestock grazing, mining, road construction, deforestation, fires) is the principal factor of population fragmentation which leaves vast tracts of suitable habitats free of leopards. Dispersing sub-adult males are capable of passing long distances between the "islands" of good habitats, but such movements are dangerous and can end up with killing a predator for its certain or alleged attacks on domestic livestock. Only handful of protected areas (all located in Iran) is sufficiently large to maintain viable leopard populations.

Mountain ecosystems are naturally patchy what further aggravates the impact of human-induced fragmentation.

Direct poaching of leopards in Armenia and other parts of the Caucasus represents occasional killings upon encounters. It occurs rather infrequently, but inflicts a substantial impact on populations for their small sizes. In Armenia the leopard population is thinly spread over the vast range and the removal of just a single individual hinders population recovery and stabilization. As a result, even in the optimal habitats (e.g., on the Meghri Ridge) where ungulate densities are high the actual leopard density is much lower than that which could be supported by existing prey resources. Killed leopards have always been concealed by poachers to avoid official punishment and their skins are usually sold to rich high-rank persons through the unknown routes.

Political conflict between Armenia and Azerbaijan over Nagorno-Karabakh brought about the factors which accelerate poaching: military posts and bases, development of agriculture and mining in safety zones and re-settlement of abandoned villages.

Viability of Armenian and Caucasian leopard populations has been maintained by immigration of individuals from northern Iran. The rates and positive effects of immigration will likely decrease in time due to erection of artificial barriers (reservoirs, infrastructure) along the Armenian-Iranian and Azerbaijani-Iranian state borders. It is

supposed that the leopard density in northern Iran is below the carrying capacity of local habitats.

Leopard presence in Armenia is inversely proportional to human density, settlements and infrastructure.

Contemporary range of the leopard in Armenia (extent of occurrence, EOO in IUCN terminology) is 7497.2 km² or 25.2% of the territory of Armenia. Area of occupancy (AOO) is only 2856.8 km² (9.6%); it encompasses the areas of permanent living and temporary (corridors) living. The predator is permanently present only in the two areas: central and eastern Khosrov Forest Reserve (207.9 km²) and eastern Meghri Ridge to the north of Nuvadi village (296.9 km²). These two areas are situated in the extreme north-west and south-east of the range, respectively, and are separated by a network of narrow and interwoven corridors. Such a pattern of range structure makes the leopard population entirely dependent upon the functioning of corridors.

The leopard habitats in Armenia include arid grasslands, arid sparse forests, mountain, subalpine and alpine meadows. The last three landscapes are used only in snow-free seasons for transient movements. Snow depth is an important limiting factor, so the leopard and its prey prefer arid grasslands and sparse forests located on the southern slopes. Hardly accessible and precipitous cliffs are essential for leopards as they hold the staple prey (bezoar goat *Capra aegagrus*), provide many shelters for hunting from ambush and resting, and are least accessible for humans and livestock. The natural prey species include the bezoar goat, wild goat (*Sus scrofa*), roe deer (*Capreolus capreolus*), Indian porcupine (*Hystrix indica*) and European hare (*Lepus europaeus*).

The leopard range in Armenia encompasses two large enough PAs: Khosrov Forest and Shikahogh reserves.

2.2 Scientific research

The first records of leopards in Armenia come from the late 1930s and until the late 1990s they represented the sporadic and anecdotal gleanings, mostly of trophies. Systematic and in-depth leopard research efforts began in 1999, first in Khosrov Forest Reserve and then all over the range southwards to the Armenian-Iranian border. Leopard distribution and ecology were investigated by means of sign counts, fecal bile acid thin-layer chromatography, photo-traps, GIS mapping and computer modeling.

These works have enabled to identify the areas of permanent presence (priority leopard conservation areas), temporary presence (corridors) and absence, as well as to determine the effects of natural and man-caused factors on leopard distribution.

At present, WWF Armenia conducts the leopard monitoring in some areas of southern Armenia. It is vitally important to improve and standardize the monitoring procedures, expand the monitoring areas, train new staff and involve other organizations (e.g., Scientific Centre of Zoology and Hydroecology of NAS RA) in monitoring leopards and their prey.

2.3 Conservation

Even though Khosrov Forest and Shikahogh reserves were established in 1958, up to 1972 the leopard had been considered as vermin and was subjected to eradication. The first step towards its conservation was inclusion to the Red Data Book of Armenia in 1987 as an endangered species. But even then the leopard conservation activities continued to be superficial and limited to the maintenance of regular conservation regime in these PAs and the functioning of conservation inspections outside of PAs.

In 2002, a number of long-term activities focused specifically on leopard conservation were launched by international organizations (WWF, CEPF and others) and the Ministry of Nature Protection of the RA. These programmes include technical assistance to the important PAs (Khosrov Forest and Shikahogh reserves) and anti-poaching squads, implementation of leopard monitoring, promotion of educational programmes and campaigns and build-up of economic incentives for local communities. Establishment of new PAs in southern Armenia is underway in compliance with the Strategy and National Action Plan for Development of Protected Areas (2002) due to financial support provided by international donors (WWF, CEPF).

2.4 Analysis of problems and favourable conditions

The principal **threats** are:

1. Leopard and prey poaching
2. Habitat loss and fragmentation because of
 - Agriculture, particularly livestock grazing
 - Plant gathering
 - Deforestation
 - Mining
 - Road and pipeline construction
 - Fires
3. Strengthening of borderline infrastructure, human capacities and test grounds
4. Absence of policies on targeted land use and re-settlement
5. Insufficient implementation of laws and conservation control
6. Lack of socio-economic incentives for local communities to be involved in conservation
7. Socio-economic hardship of local people
8. "Shortsightedness" of mentality (preference of short-term economic gains over the long-term global benefits).

The main **gaps** in knowledge about the leopard in Armenia are:

- Movement patterns inside Armenia and between Armenia and Iran
- Use of corridors, particularly in the Zangezur Ridge
- Sex/age structure of population
- Population size and its trends in space and time
- Mechanisms of population self-maintenance and location of breeding units.

The following **gaps** are also present:

- Insufficient participation of stakeholders in leopard, prey and habitat conservation
- Insufficient awareness of stakeholders
- Insufficient exchange of information between the stakeholders on cases of leopard and prey poaching
- Insufficiency of existing PAs
- Absence of transboundary cooperation.

In spite of these threats and gaps, Armenia holds certain **favourable conditions** which could promote the leopard conservation:

- Will of the RA Government
- Involvement of Armenia in international conservation agreements
- Ecoregional Conservation Plan
- Caucasus Biodiversity Council
- Ecoregional exchange of experience and knowledge
- High profile of the species
- Expansion of existing PAs and establishment of new PAs
- Ongoing conservation programmes and projects
- Growth of international financial support
- Existence of national and international NGOs involved in biodiversity, particularly leopard and its prey, conservation
- Growing role of local communities in conservation
- Existence of educational and awareness-raising programmes targeted on local communities.

III. VISION, GOAL AND OBJECTIVES OF THE NATIONAL ACTION PLAN

3.1 Vision

The leopard and other wildlife prosper in natural habitats of Armenia and co-exist with local people.

3.2 Goal

The general goal of leopard conservation is to ensure, by 2017, stabilization of leopard population as measured by monitoring and efficient conservation of leopard, prey and their habitats.

3.3 Objectives

The National Action Plan pursues the accomplishment of the following objectives (Appendix 1):

1. Implementation of research and monitoring of leopard and prey numbers and the status of their habitats

2. Establishment of well-managed system of PAs (Econet) to ensure safe existence of the leopard and its prey
3. Ensuring efficient work of stakeholders involved in leopard, prey and habitat conservation
4. Ensuring assistance to leopard conservation by local population and national security forces
5. Development and implementation of awareness-raising strategy, action plan and environmental education system in relation to leopard conservation
6. Ensuring international cooperation and coordinated activities in leopard conservation within the transboundary areas of the leopard range.

IV. ACTIVITIES

To achieve the objectives listed above, the following activities should be carried out by stakeholders within the timetable given in Appendix 1:

ACTIVITY 1

DEVELOP AND APPLY THE UNIFIED METHODS OF LEOPARD AND PREY MONITORING AND CENSUS, AS WELL AS HABITAT MONITORING

Activity 1.1

Develop the methodologies of leopard and prey (at least the bezoar goat) census and evaluation of their population status

Census and assessment of current population status and its trends in the leopard and its prey require for development of standardized monitoring techniques. The bezoar goat is the leopard's staple prey and should receive a priority in monitoring. The techniques should be based on standardized and unified protocols for data input and a comprehensive description of the methodologies used in form of the illustrated report with a list of references, appendices and, if necessary, tables.

The optimal methods of leopard monitoring are two: (1) counts of scats, tracks and scrapes; and (2) use of camera photo-traps. The latter method is expensive and can be used in monitoring only after its expedience is proved through the feasibility studies in some selected areas.

The best way of bezoar goat monitoring is using direct observations from dominating heights.

In 2007, WWF Armenia has developed the large mammal monitoring programme for Shikahogh Reserve which includes the leopard, bezoar goat and other species. On 25 April, 2008 it was officially approved by the Ministry of Nature Protection of the RA (letter 2-02/71). At present, this programme has been successfully implemented and can also be used for leopard and bezoar goat monitoring in other parts of the range.

Activity 1.2

Verify the methodologies in selected areas

The methodology developed for leopard and bezoar goat monitoring should be verified in the best areas (e.g., eastern Khosrov Forest Reserve and Meghri Ridge). After the results are obtained and thoroughly examined, the methodology should be applied elsewhere within the leopard range.

Activity 1.3 Develop and verify the methodologies of assessment of natural and man-caused impacts on the leopard, prey and habitats

Leopard and bezoar goat monitoring should be accompanied by collection of detailed information on negative factors affecting their populations (poaching, fires and others). Then, this information should be plotted onto the GIS maps and analyzed.

Activity 1.4 Hold the training courses for PA personnel on monitoring implementation and database maintenance

Leopard, prey and habitat monitoring cannot be successful without participation of PA personnel, especially in Khosrov Forest and Shikahogh reserves. To stimulate their involvement, members of conservation departments of these PAs should be provided with training courses consisting of theoretical and practical lessons.

Activity 1.5 Carry out the leopard and prey (at least the bezoar goat) counts and population status assessment in the priority and other areas

Leopard and bezoar goat census and population status assessment should first be carried out in central and eastern Khosrov Forest Reserve (Khosrov and Khachadzor districts) and eastern Meghri Ridge (to the north of the Nuvadi village). Moreover, such works should be done within the corridors in the Vayk, Zangezour and Bargushat ridges, as well as in the western and central Meghri Ridge. Special attention should be paid to those areas where information about the leopard is either absolutely absent or lacking (Urts Ridge, Karabakh Highland and others).

Activity 1.6 Create and maintain the database on population status of the leopard and its prey (at least the bezoar goat)

Information derived from leopard and prey monitoring should be put into the standardized and uniform electronic database, preferably in Excel 2000 and similar formats.

ACTIVITY 2 ASSESS THE ROLE AND EFFICIENCY OF PAs IN LEOPARD CONSERVATION AND PROPOSE THE IMPROVEMENT MEASURES

Activity 2.1 Assess the role and efficiency of PAs located within the leopard range, define and initiate the measures to increase the effectiveness of PAs

Here the notion “role of PAs” is understood as the contribution of PAs to leopard and prey protection in Armenia. The leopard range in the country is known to be located mostly within the unprotected lands, so the role of PAs cannot be overestimated.

Build-up of efficiency of PAs should include provision of technical assistance, implementation of incentive-raising programmes in local communities, undertaking of population monitoring by PA personnel and other activities.

ACTIVITY 3

ESTABLISH THE PAs OF DIFFERENT STATUS IN THE IMPORTANT AREAS ON A BASIS OF ANALYSIS OF INFORMATION ON LEOPARD POPULATION AND HABITATS

Activity 3.1

Establish Arevik, Zangezur, Gnishik and other PAs

Establishment of new PAs (Arevik on the Meghri and Zangezur ridges, Zangezur in the Zangezur Ridge) has been under consideration by the Ministry of Nature Protection of the RA. Preliminary works on establishment of Gnishik PA in the Vayk Ridge were carried out before. The status of these PAs is still unclear. Establishment of these and other PAs is intended by the Strategy and National Action Plan for Development of Protected Areas (2002).

Activity 3.2

Develop and approve the management plans of PAs located in southern Armenia

The management plan of Khosrov Forest Reserve is under adoption now. The draft management plan of Shikahogh Reserve was prepared very recently. Besides these documents, it is essential to prepare and adopt the management plans of the pending PAs (Arevik, Zangezur, Gnishik).

Activity 3.3

Ensure efficient work of newly established PAs by provision of technical assistance, personnel training and other ways

To avoid making the pending PAs “paper projects”, they should be supported by all available means: technical assistance, staff training, participation in scientific and conservation programmes, etc.

Activity 3.4

Develop and implement the leopard conservation programmes designed specifically for PAs

Apart from general conservation strategy and targeted activities, each PA should have and implement its own programme on leopard conservation.

ACTIVITY 4

SAFEGUARD THE LONG-TERM EXISTENCE OF CORRIDORS AND STEPPING STONES FOR THE LEOPARD

Activity 4.1

Identify the important corridors and stepping stones for the leopard in Armenia

This information should be received by means of population monitoring (see above). Corridors represent the integral areas of suitable habitats where leopards can move from one site to another and also live, depending on prey sufficiency and other factors (disturbance, available shelters and water sources, snow cover). Stepping stones are the disjunct areas of suitable habitats which are too small for leopard living and can only be used for movements, even under optimal environmental conditions.

Existence of safe corridors and stepping stones is especially important for adult male leopards maintaining vast home ranges and for sub-adult males dispersing far from

natal ranges and away from resident adult males and humans in order to establish their own land tenures.

Activity 4.2 Carry out the analysis of modern land use inside the corridors and stepping stones

Land use in the PAs, forestries and communal lands located within the leopard corridors and stepping stones should be studied in GIS and officially registered by state cadastre.

Maintenance of a network of corridors and stepping stones is vitally important for leopard conservation in Armenia. Its efficiency ensues to a great extent from the functioning of roads, pipelines and other linear barriers. It is known that sub-adult leopards are most vulnerable to be killed by vehicles, as they disperse from mother and do not hold sufficient experience in contacts with humans and traffic.

Activity 4.3 Define the leopard- and prey-friendly land use patterns and strategies in the corridors and stepping stones

Land use in the leopard corridors and stepping stones should rely on stringent control of grazing areas, quantities of grazed livestock, hunting loads and regimes of deforestation and mining.

Activity 4.4 Assign the status to the corridors and stepping stones and ensure their conservation, management and integrity

Legislative status of the corridors and stepping stones in Armenia is not yet clarified. It is important to develop, adopt and implement the laws, statutory acts and procedures to ensure integrity and proper management of the corridors and stepping stones.

Activity 4.5 Delineate the areas in demand of urgent and specific conservation measures and identify the “core groups” essential for survival of the leopard and prey populations

The areas where leopards exist permanently, temporarily or are absent in Armenia are known (see above), but need further clarifications.

ACTIVITY 5 ENSURE EFFICIENT FUNCTIONING OF CONSERVATION DEPARTMENTS OF THE PAs, AS WELL AS FORESTRIES AND REGIONAL CONSERVATION INSPECTIONS

Activity 5.1 Ensure efficient functioning of conservation departments of Khosrov Forest and Shikahogh reserves, regional conservation inspections and forestries located within the leopard range

Even though Armenia’s PAs have been on place since 1958, extant conservation measures, particularly on the leopard and its prey, are obviously insufficient. The activities targeted at technical assistance and staff training have begun only recently. It is urgently needed to keep these works going in Khosrov Forest and Shikahogh reserves in compliance with their management plans.

Conservation Inspection subordinated to the Ministry of Nature Protection of the RA is the only body authorized to carry out conservation outside of PAs. It is important to strengthen participation of the regional inspections of the Ararat, Vayots Dzor and Siunik provinces by providing them technical assistance, involving their personnel in population monitoring and implementing similar activities.

Forestries play a substantial role in leopard, prey and habitat conservation as they hold significant tracts of sparse and dense forests. Meantime, their technical, human and financial resources are meager and until now these organizations keep functioning as economical, not conservation, entities. It is important to carry out the activities targeted at capacity building of forestries.

Activity 5.2 *Establish and technically support the anti-poaching squads in the Vayots Dzor and Siunik provinces, Khosrov Forest and Shikahogh reserves*

Anti-poaching squads should comprise the staff members of Khosrov Forest and Shikahogh reserves, important forestries and regional conservation inspections. As the Siunik Province encompasses the roughest terrain, but has been the leopard and prey (bezoar goat, roe deer and Indian porcupine) stronghold in the country, this region should contain more anti-poaching squads than the other two provinces.

Normal functioning of anti-poaching squads should be ensured by the programmes directed towards the build-up of efficiency of the PAs, forestries and regional conservation inspections (see above).

Activity 5.3 *Develop the educational programmes and conduct the annual advanced training courses for relevant entities*

Implementation of educational programmes aimed at professional development of personnel of the PAs, forestries and regional conservation inspections has been among the most important activities in leopard, prey and habitat conservation.

Activity 5.4 *Improve the legislative basis*

Legislative basis of the functioning of Armenia's forestries and regional conservation inspections needs to be improved. For example, forestries should separate economic and conservation activities and inspections should gain more independence in their work.

ACTIVITY 6 ENSURE THE INVOLVEMENT OF LOCAL COMMUNITIES AND NATIONAL SECURITY FORCES IN LEOPARD, PREY AND HABITAT CONSERVATION

Activity 6.1 *Develop and implement the action plan aimed at involvement of local communities and security forces in leopard, prey and habitat conservation*

Not a single conservation activity implied by this document is feasible without establishment of partnership with local people and personnel of borderline facilities located along the state borders of southern Armenia. Leopards and, to a lesser extent, their prey cross the borders with Azerbaijan and Iran during their regular movements.

Armed local people and staff of state security forces pose a great threat to safe existence of the leopard and its prey. It is important to develop and implement the programme on establishment of partnership with local people and state security forces and on raising their awareness in leopard, prey and other wildlife conservation.

Meantime, any information about killing a leopard and its prey should become a subject of a thorough investigation which, in case of confirmation, should be forwarded to relevant bodies for official trial start-up. According to the Law on rates of compensation of the damage inflicted to flora and fauna by violation of nature conservation, the fine for killing a leopard or a bezoar goat is set at 3 million drams.

One of the most important mechanisms of control over hunting and poaching across the unprotected areas should be elaboration of their regulation procedures. The quantities of licenses issued for hunting in the Geghama, Vayk, Zangezour, Bargushar and Meghri ridges should plummet to zero.

Activity 6.2 *Develop and implement the community-based leopard conservation programmes*

Special locally focused programmes should be developed to stimulate participation of local communities in leopard conservation.

Activity 6.3 *Prepare and sign the memorandum on cooperation with local communities and security forces in leopard, prey and habitat conservation*

This memorandum should be aimed at creation of fundamentals for further cooperation with local communities and state security forces in leopard, prey and habitat conservation.

Activity 6.4 *Develop and implement the awareness-raising programmes for local communities and security forces*

Local hunters, other experts and members of state security forces should be provided with training courses to stimulate their participation in leopard conservation and raise their knowledge and motivation.

ACTIVITY 7 **ASSIST TO DEVELOPMENT OF ALTERNATIVE INCOME GENERATING PROGRAMMES FOR LOCAL COMMUNITIES**

Activity 7.1 *Develop and implement the model projects targeted at sustainable use of natural resources and generation of alternative incomes*

Poverty of local rural population adds its strong reliance on natural resources and landscapes. For this reason, economic incentives for local participation in biodiversity, particularly, leopard conservation should be boosted.

Assessment of current socio-economic situation within the leopard range should include the problem analysis and prioritization for each particular community. For instance, the following kinds of economic activities look expedient:

- Development and implementation of small business programmes
- Creation of opportunities for sustainable development of prospective agricultural activities (animal husbandry, apiculture, horticulture, poultry farming)
- Development and functioning of small agricultural processing enterprises
- Ecotourism.

The principal obstacles for agricultural production in Armenia are limited market and hindered access of producers to the market. They are most obvious in the Siunik Province most distant from the capital Yerevan where almost all national market is concentrated. Market studies and development of improvement measures would allow the producers to better up their productivity and reduce their dependence on the centralized capital market.

Activity 7.2 *Develop the model ecotourism development project in a PA which would contribute to leopard and prey (at least the bezoar goat) conservation*

Ecotourism looks the most promising source of alternative incomes for local people. The first steps are already done in Khosrov Forest Reserve due to the joint efforts of the Ministry of Nature Protection of the RA and WWF Armenia: the visitor centre is constructed, a network of routes is developed and the visitor programme is elaborated and approved by the Ministry of Nature Protection of the RA. These activities successfully go ahead and should also be performed in Shikahogh Reserve in the nearest future.

Activity 7.3 *Prepare the legislative basis and create the opportunities for ecotourism development in the leopard range*

Southern Armenia, especially its mountainous areas serving as stronghold for the leopard and its prey, is most promising, but poorly prepared, for ecotourism development. It is essential to develop and realize the legislative basis for regulation of ecotourism, development of related infrastructure, advertising and personnel training.

Activity 7.4 *Advertise the ecotourism resources of southern Armenia*

Development of ecotourism, like all other kinds of economic activities, is impossible without proper advertising. Armenia does not still have an image of an ecotourism destination (like, for example, Kenya or Nepal) and should take large-scale and targeted efforts to pick up its share from this globally lucrative market. Many tourists visit Armenia each year, but only few of them undertake ecotours, usually on their own.

Activity 7.5 *Develop and use the ecotourism routes and services*

Professional development of routes for ecotourists and removal of the most vulnerable areas from any human disturbance (noise, garbage, soil tramping) have been indispensable components of efficient conservation. The areas of leopard living and breeding should be immediately removed from any visitations by tourists. The same applies also to the areas where other rare wildlife (brown bear, bezoar goat, black vulture) occur.

Activity 7.6 *Apply the successful model projects in other areas of the leopard range*

If successfully implemented, the model ecotourism development projects should be applied elsewhere within the leopard range.

ACTIVITY 8 **DEVELOP AND IMPLEMENT THE AWARENESS-RAISING STRATEGY AND ACTION PLAN FOCUSED ON LEOPARD, PREY AND HABITAT CONSERVATION**

Activity 8.1 *Develop and apply the national awareness-raising strategy and action plan for leopard, prey and habitat conservation for different target groups and stakeholders*

The awareness-raising strategy and action plan could be based on the leopard campaigning strategy developed by WWF Armenia.

The strategy should be focused on awareness-raising among different target groups and stakeholders (schoolchildren, students, local people, business, state security forces, border guards, stakeholders). It can include the following components:

- Production and distribution of brochures, booklets, posters, calendars, documentaries, TV programmes, computer games, puzzles and other materials
- Organization of drawing contests, lectures and courses
- Development and maintenance of website www.leopard.am
- Implementation of campaigns and other activities
- Holding the Leopard Day in schools, colleges and universities.

From the geographical standpoint, activities should be carried out in Yerevan, as well as in towns and villages neighbouring Khosrov Forest and Shikahogh reserves and also located in the Vayk, Zangezur, Bargushat and Meghri ridges.

Efficiency of awareness-raising activities should be assessed through the regular monitoring of awareness and participation of the target groups. This work would enable to check up the strategy and adapt it to changing conditions.

ACTIVITY 9 **IMPROVE THE SYSTEM OF ENVIRONMENTAL EDUCATION**

Activity 9.1 *Develop, publish and apply the methodological materials for tutors and educational materials for schoolchildren and students, and hold the training courses for tutors and lecturers*

The goal of these activities is to provide, on a systematic basis, knowledge about the leopard, prey and habitats to schoolchildren and students through the optional lessons, practical work, excursions and special courses.

Tutors and other educators should be properly informed about and trained to the educational materials and methodologies offered.

Efficiency of educational activities should be monitored through the regular surveys of schoolchildren's and students' awareness and participation. Environmental educa-

tion is by definition a non-stop process, hence it should be constantly re-considered and upgraded.

Activity 9.2 *Incorporate the leopard topic to all levels of existing biology and conservation curricula*

This approach would allow to regularly inform schoolchildren and students about the leopard, its prey and habitats in Armenia. It should be performed with assistance of the Ministry of Education and Science of the RA.

ACTIVITY 10 **ENSURE THE MECHANISMS OF TRANSBOUNDARY, PARTICULARLY ARMENIAN-IRANIAN, COOPERATION**

Activity 10.1 *Prepare and sign the inter-state memorandum on cooperation in conservation between the RA and Iran*

Signing the memorandum by the Minister of Nature Protection of the RA and the Head of the Department of Environment (DoE) of the Islamic Republic of Iran would create the background for the long-term bi-national cooperation in conservation. At present, Ecoregional Conservation Plan (2005) serves the basis for preparation of such a memorandum.

Activity 10.2 *Prepare and sign the memorandum on cooperation in leopard monitoring and conservation between the Ministry of Nature Protection of the RA and the Department of Environment of Iran*

Preparation, signing and implementation of this document should be done within the bi-national Armenian-Iranian memorandum.

ACTIVITY 11 **ENSURE THE EXCHANGE OF SCIENTIFIC AND RESEARCH EXPERTISE AND INFORMATION AND ESTABLISH THE DATABASE ON LEOPARD MONITORING**

Activity 11.1 *Hold the training courses and workshops for participants from the involved countries*

The joint Armenian-Iranian workshops should be held to establish the business relations between the specialists from both countries and to create the background for information and expertise exchange.

Activity 11.2 *Develop and apply the system of information and expertise exchange*

It is important to develop, verify and optimize the system of information exchange between the specialists of Armenia and Iran in order to ensure the efficiency of joint works related to the leopard in transboundary areas of both countries.

Activity 11.3

Coordinate the research activities and estimate leopard numbers by using unified methodologies

Joint implementation of leopard research and monitoring, creation and maintenance of relevant database, and standardized analysis of leopard data in transboundary areas of Armenia and Iran have been the essential tools of leopard conservation and population status assessment. Of particular emphasis is receiving and analyzing data on leopard movements across the Armenian-Iranian state border and on their role in the maintenance of Armenian leopard population viability.

ACTIVITY 12

COORDINATE THE ESTABLISHMENT OF TRANSBOUNDARY ECONET

Activity 12.1

Establish the transboundary Armenian-Iranian PAs

The best way to keep the integrity of Armenian and Iranian leopard populations is the establishment of PAs inside southern Armenia and the adjoining areas of Iran and creation of well-functioning network of transboundary PAs. The pending Arevik PA in Armenia and Kiamaky Wildlife Refuge and Arasbaran Protected Area in Iran's East Azerbaijan Province should serve the cores of this prospective Econet.

V. IMPLEMENTATION OF THE NATIONAL ACTION PLAN

5.1 Official approval and follow-up

Official approval and signing of the National Action Plan by the Minister of Nature Protection of the RA will indicate the beginning of its practical realization.

5.2 Institutional capacities

The organizations listed below should play an important role in implementation of the National Action Plan through the elaborated mechanisms of collaboration and coordination.

- Ministry of Nature Protection of the RA, including PAs and Conservation Inspection
- Ministry of Agriculture of the RA
- Ministry of Economy of the RA
- Ministry of Education and Science of the RA
- Ministry of Regional Administration of the RA
- Ministry of Foreign Affairs of the RA
- National academic entities, including the Scientific Centre of Zoology and Hydroecology of the NAS RA
- National and international NGOs
- International academic entities
- Local urban and rural communities.

5.3 Financial support

It is anticipated that financial resources essential for proper implementation of the National Action Plan will come from the state budget of the RA and international donors (grants, donations).

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APPENDIX 1

National Action Plan for Leopard (*Panthera pardus*) Conservation in Armenia (2009-2017)

<i>Objectives</i>	<i>Activities</i>	<i>Indicators</i>	<i>Dead- lines</i>	<i>Preliminary budget (Eu- ro)</i>	<i>Sources of financial support</i>	<i>Implementing bodies (stakeholders)</i>
SPECIES AND POPULATION						
I. Implementation of research and monitoring of leopard and prey numbers and the status of their habitats	<p>1. Develop and apply the unified methods of leopard and prey monitoring and census, as well as habitat monitoring</p> <p>1.1 Develop the methodologies of leopard and prey (at least the bezoar goat) census and evaluation of their population status</p> <p>1.2 Verify the methodologies in selected areas</p> <p>1.3 Develop and verify the methodologies of assessment of natural and man-caused impacts on the leopard, prey and habitats</p> <p>1.4 Hold the training courses for PA personnel on monitoring implementation and database maintenance</p> <p>1.5 Carry out the leopard and prey (at least the bezoar goat) counts and population status assessment in the priority and other areas</p> <p>1.6 Create and maintain the database on population status of the leopard and its prey (at least the bezoar goat)</p>	Annual and interim reports, agreements, documents	2009-2010	300,000	State budget, international donors	Scientific Centre of Zoology and Hydroecology of NAS RA, Ministry of Nature Protection of the RA, Ministry of Education and Science of the RA, Ministry of Regional Administration of the RA, PAs, academic entities, national and international NGOs, local communities

HABITATS AND CORRIDORS						
II. Establishment of well-managed system of PAs (Econet) to ensure safe existence of the leopard and its prey	<p>2. Assess the role and efficiency of PAs in leopard conservation and propose the improvement measures</p> <p>2.1 Assess the role and efficiency of PAs located within the leopard range, define and initiate the measures to increase the effectiveness of PAs</p>	Annual and interim reports, agreements, maps, documents	2009-2012	20,000	State budget, international donors	Ministry of Nature Protection of the RA, PAs, national and international NGOs
	<p>3. Establish the PAs of different status in the important areas on a basis of analysis of information on leopard population and habitats</p> <p>3.1. Establish Arevik, Zangezour, Gnishik and other PAs 3.2. Develop and approve the management plans of PAs located in southern Armenia 3.3. Ensure efficient work of newly established PAs by provision of technical assistance, personnel training and other ways 3.4. Develop and implement the leopard conservation programmes designed specifically for PAs</p>	PAs, annual and interim reports, maps, agreements, documents, goods of technical assistance	2009-2017	5,000,000	State budget, international donors	Ministry of Nature Protection of the RA, PAs, Ministry of Regional Administration of the RA, national and international NGOs
	<p>4. Safeguard the long-term existence of corridors and stepping stones for the leopard</p> <p>4.1. Identify the important corridors and stepping stones for the leopard in Armenia 4.2. Carry out the analysis of modern land use inside the corridors and stepping stones 4.3. Define the leopard- and prey-friendly land use patterns and strategies in the corridors and stepping stones 4.4. Assign the status to the corridors and stepping stones and ensure their conservation, management and integrity 4.5. Delineate the areas in demand of urgent and specific conservation measures and identify the “core groups” essential for survival of the leopard and prey populations</p>	Annual and interim reports, maps, agreements, documents	2009-2017	3,500,000	State budget, international donors	Ministry of Nature Protection of the RA, Ministry of Agriculture of the RA, Ministry of Economy of the RA, PAs, local communities, national and international NGOs, economic entities

STAKEHOLDERS AND COOPERATION						
<p>III. Ensuring efficient work of stakeholders involved in leopard, prey and habitat conservation</p>	<p>5. Ensure efficient functioning of conservation departments of the PAs, as well as forestries and regional conservation inspections</p> <p>5.1. Ensure efficient functioning of conservation departments of Khosrov Forest and Shikahogh reserves, regional conservation inspections and forestries located within the leopard range</p> <p>5.2. Establish and technically support the anti-poaching squads in the Vayots Dzor and Syunik provinces, Khosrov Forest and Shikahogh reserves</p> <p>5.3. Develop the educational programmes and conduct the annual advanced training courses for relevant entities</p> <p>5.4. Improve the legislative basis</p>	<p>Annual and interim reports, agreements, documents, goods of technical assistance</p>	<p>2009-2017</p>	<p>2,000,000</p>	<p>State budget, international donors</p>	<p>Ministry of Nature Protection of the RA, PAs, Scientific Centre of Zoology and Hydroecology of NAS RA, local communities, national and international NGOs</p>
<p>IV. Ensuring assistance to leopard conservation by local population and national security forces</p>	<p>6. Ensure the involvement of local communities and national security forces in leopard, prey and habitat conservation</p> <p>6.1. Develop and implement the action plan aimed at involvement of local communities and security forces in leopard, prey and habitat conservation</p> <p>6.2. Develop and implement the community-based leopard conservation programmes</p> <p>6.3. Prepare and sign the memorandum on cooperation with local communities and security forces in leopard, prey and habitat conservation</p> <p>6.4. Develop and implement the awareness-raising programmes for local communities and security forces</p>	<p>Annual and interim reports, agreements, documents</p>	<p>2009-2017</p>	<p>50,000</p>	<p>State budget, international donors</p>	<p>RA Government, PAs, Centre of Zoology and Hydroecology of NAS RA, local communities, national and international NGOs</p>

	<p>7. Assist to development of alternative income generating programmes for local communities</p> <p>7.1. Develop and implement the model projects targeted at sustainable use of natural resources and generation of alternative incomes</p> <p>7.2. Develop the model ecotourism development project in a PA which would contribute to leopard and prey (at least the bezoar goat) conservation</p> <p>7.3. Prepare the legislative basis and create the opportunities for ecotourism development in the leopard range</p> <p>7.4. Advertise the ecotourism resources of southern Armenia</p> <p>7.5. Develop and use the ecotourism routes and services</p> <p>7.6. Apply the successful model projects in other areas of the leopard range</p>	Annual and interim reports, agreements, maps, documents	2009-2017	1,500,000	State budget, international donors	Ministry of Nature Protection of the RA, Ministry of Economy of the RA, tour-operators, local communities, national and international NGOs
<p>V. Development and implementation of awareness-raising strategy, action plan and environmental education system in relation to leopard conservation</p>	<p>8. Develop and implement the awareness-raising strategy and action plan focused on leopard, prey and habitat conservation</p> <p>8.1. Develop and apply the national awareness-raising strategy and action plan for leopard, prey and habitat conservation for different target groups and stakeholders</p>	Annual and interim reports, agreements, maps, published materials, documents	2009-2017	250,000	State budget, international donors	Ministry of Nature Protection of the RA, Ministry of Education and Science of the RA, PAs, local communities, biological and educational entities, national and international NGOs
	<p>9. Improve the system of environmental education</p> <p>9.1. Develop, publish and apply the methodological materials for tutors and educational materials for schoolchildren and students, and hold the training courses for tutors and lecturers</p> <p>9.2. Incorporate the leopard topic to all levels of existing biology and conservation curricula</p>	Annual and interim reports, agreements, published materials, documents	2009-2017	1,000,000	State budget, international donors	Ministry of Nature Protection of the RA, Ministry of Education and Science of the RA, PAs, secondary and higher schools, colleges and universities, local communities, national and international NGOs

INTERNATIONAL COOPERATION						
VI. Ensuring international cooperation and coordinated activities in leopard conservation within the transboundary areas of the leopard range	<p>10. Ensure the mechanisms of transboundary, particularly Armenian-Iranian, cooperation</p> <p>10.1. Prepare and sign the inter-state memorandum on cooperation in conservation between the RA and Iran</p> <p>10.2. Prepare and sign the memorandum on cooperation in leopard monitoring and conservation between the Ministry of Nature Protection of the RA and the Department of Environment of Iran</p>	Annual and interim reports, agreements, documents	2009-2012	30,000	State budget, international donors	Ministry of Nature Protection of the RA, Ministry of Foreign Affairs of the RA, Centre of Zoology and Hydroecology of NAS RA, national and international NGOs
	<p>11. Ensure the exchange of scientific and research expertise and information and establish the database on leopard monitoring</p> <p>11.1. Hold the training courses and workshops for participants from the involved countries</p> <p>11.2. Develop and apply the system of information and expertise exchange</p> <p>11.3. Coordinate the research activities and estimate leopard numbers by using unified methodologies</p>	Annual and interim reports, agreements, documents, maps, scientific and popular publications	2009-2012	50,000	State budget, international donors	Ministry of Nature Protection of the RA, Centre of Zoology and Hydroecology of NAS RA, national and international NGOs
	<p>12. Coordinate the establishment of transboundary Econet</p> <p>12.1. Establish the transboundary Armenian-Iranian PAs</p>	PAs, annual and interim reports, agreements, documents, maps, scientific and popular publications	2010-2017	1,400,000	State budget, international donors	Ministry of Nature Protection of the RA, Ministry of Foreign Affairs of the RA, Centre of Zoology and Hydroecology of NAS RA, national and international NGOs

APPENDIX 2

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