Strategy for the Conservation of the Leopard in the Caucasus Ecoregion

Revised Version 2017

Results from the Strategic Planning Workshop on Leopard Conservation in the Caucasus

Tbilisi, Georgia, 25 – 26 April 2017

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Contents

<u>Acronyms</u>

ECP	Ecoregional Conservation Plan
EEP	European Endangered Species Programme
METT	Management Effectiveness Tracking Tool
NAP	National Action Plan
NGO	Non-governmental organisation
NP	National Park
PA	Protected Area
SCALP	Status and Conservation of the Alpine Lynx Population
ZOPP	Zielorientierte Projektplanung (Goal oriented project planing)

1 Introduction

Ten years ago, in a workshop organised by the WWF Caucasus Programme in Tbilisi, Georgia, from 30 May – 1 June 2007, the first "*Strategy for the Conservation of the Leopard in the Caucasus Ecoregion*" was developed by a group of 37 representatives from governments, experts from all six Caucasian countries and international experts (Breitenmoser-Würsten et al. 2007). The *Strategy 2007* has guided leopard conservation in the past years and facilitated the development of the National Action Plans (NAPs) in Armenia, Azerbaijan and Georgia.

This "*Strategy for the Conservation of the Leopard in the Caucasus Ecoregion*" contributes to meet the targets of the Ecoregional Conservation Plan (ECP) for the Caucasus, in particular to the long term leopard conservation target (by 2025): "An effectively managed leopard conservation landscape consisting of PAs and connecting corridors is established and leopard population is increased by 50 percent". The ECP is the overall conservation plan for the region and therefore the common guideline for national governments, NGOs and international donor organisations (ECP 2012).

In an expert workshop in 2014 (Breitenmoser et al. 2014a), the conservation status of the leopard in the Caucasus, implementation of the *Strategy 2007* and of the NAPs was reviewed and assessed. The conclusion of the workshop participants was that, although the *Strategy 2007* provided an important framework for the conservation of leopards and its prey in the eco-region, not all parts of the plan had been implemented directly or indirectly through the NAPs. The reasons for shortcomings in the implementation of proposed conservation measures were (1) too ambitious Targets/Results, (2) lack of responsibility and/or funding for tackling certain tasks, and (3) incorrect input assumptions (e.g. with regard to leopard distribution and abundance) for the development of the *Strategy* in 2007. The experts at the workshop concluded that a revision of the *Strategy for the Conservation of the Leopard in the Caucasus Ecoregion* would be topical and urgent.

On 25–26 April 2017, a group of 47 conservationists, scientists and country representatives gathered again in Tbilisi to review and update the *Strategy* (Fig. 1.1). The result is the present document, the *Strategy 2017*.
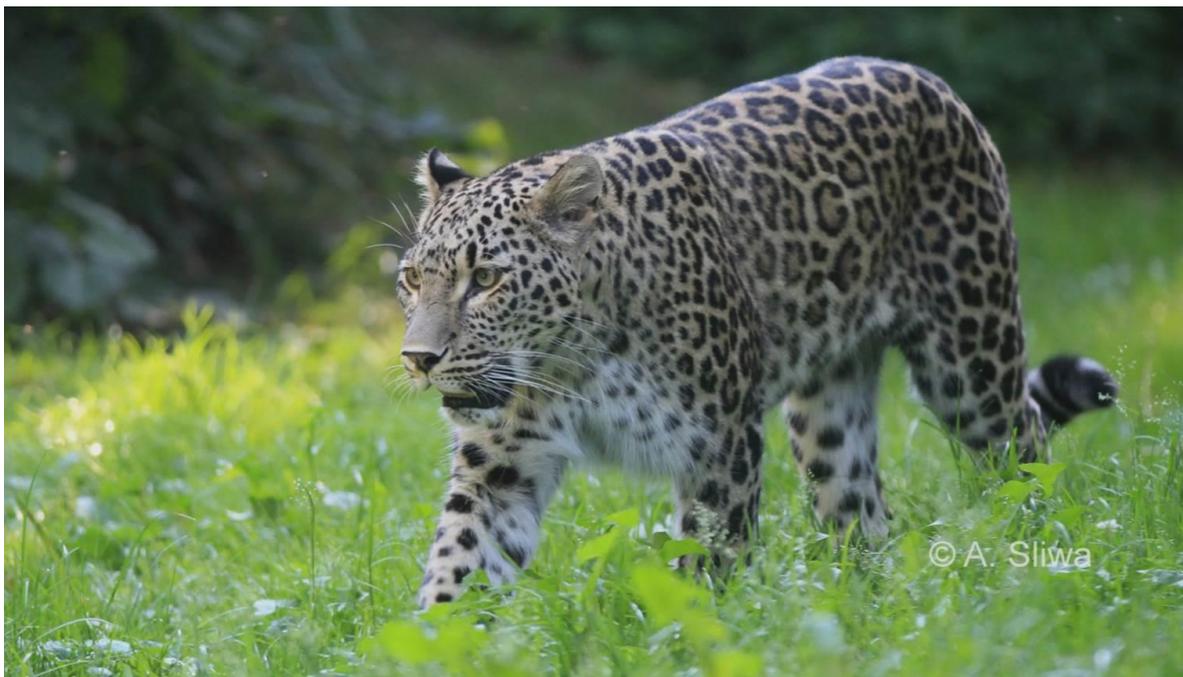
In the expert workshop in 2014, the following shortcomings and problems for the effective implementation of measure to conserve the leopard were identified:

1. Lack of funding & equipment;
2. Lack of holistic approach of authorities;
3. Lack of scientific research (systematic camera-trapping, telemetry);
4. Lack of capacity and capacity building, few specialists designated to leopard;
5. Unreliable and incomplete prey surveys and unstandardised methodology;
6. Lack of information from conflict zones.

While some of the challenges – such as missing information from conflict zones or approach of authorities – are beyond the influence of a group of conservationists, several of the points listed above can be addressed in the revised *Strategy 2017* and can be tackled through improved cooperation between individuals and institutions involved in leopard conservation in the Caucasus. Most of these points are indeed presented in a more consistent and more practical form in the new *Strategy*, either in form of more tangible Results or more feasible Activities.

The *Strategy 2017* will therefore provide an even more useful tool for the conservation of the leopard in the Caucasus. But it will only be as good as its implementation; all individuals and institutions interested and directly or indirectly involved in the recovery of the leopard in the Caucasus eco-region are therefore called to employ the *Strategy 2017* during the next years and to provide feedback allowing improving it.

Fig. 1.1. Group picture of the participants of the Strategic Planning Workshop on Leopard Conservation in the Caucasus, Tbilisi, Georgia, 25 – 26 April 2017.

2 Status of leopard and leopard conservation in the Caucasus ecoregion

Since the development of the *Strategy 2007*, leopard monitoring in the Caucasus has considerably advanced. Camera trapping is nowadays the most important survey method, allowing to better separate indisputable presence signs (Category 1, e.g. photographic or genetic evidence) from expert confirmed observations (C2) and not confirmed observations (C3). Still, an uncertainty remains in areas of very scattered and rare observations, which could be either long-range dispersing and hence transient animals from the south-east or indicate a very low detection rate of resident individuals. Special emphasis is therefore given to the confirmed presence of resident females and reproduction.

Distribution. Historically, the leopard was found in almost all of the Caucasus Ecoregion, but its present distribution according to the IUCN Red List is limited to the Talysh Mountains, along the Lesser Caucasus in Nakhchyvan Autonomous Republic, South Armenia and around Kiamaky WR, as well as in North Ossetia and Dagestan (Fig. 2.1; Stein et al. 2016). However, recent years have only produced one reliable record of leopard presence in the eastern Greater Caucasus. Consequently, it has been suggested, that the presence in North Ossetia and Dagestan consists only of long-range dispersers and that there is no established population remaining (Breitenmoser et al. 2014b). Meanwhile, since the publication of the IUCN Red List, 3 individuals have been released in the western Greater Caucasus, in the Caucasus Biosphere Reserve near Sochi, as part of a reintroduction project (Fig. 2.1; Hartmann et al. 2016, Rozhnov et al. 2017).

Crucial for the leopard population in the Caucasus Ecoregion is the connectivity to source populations in Iran. The connectivity to the Zagros population in south-western Iran and adjacent Iraq appears to be broken for quite a long time, and the connectivity to the Alborz population (incl. Golestan NP) seems to be threatened (Sanei et al. 2016, Breitenmoser et al. 2017). A recent survey found no presence of leopard in Lisar PA south of the Talysh mountains, and the western-most reproduction was detected in Deylaman-Dorfak no-Hunting area (M. Soofi pers. comm.). The distribution of the leopard in the Alborz range is heavily influenced by the locally low abundance of wild ungulates (M. Soofi pers. comm.).

Abundance. The Status Assessment for the *Strategy 2007* estimated a population of less than 15 individuals in the Greater Caucasus and less than 50 in the Lesser Caucasus (Lukarevsky et al. 2007). Subsequent surveys and monitoring efforts indicated that this estimation was too optimistic. Compiled leopard records (Fig. 2.1) were able to only prove the presence of less than 10 individuals in 2014 in the whole of the Caucasus Ecoregion (without Iran), plus an unknown number in the Iranian Caucasus (Breitenmoser et al. 2014a).

Trend. Positive developments were recently observed in the following Priority Conservation Areas[1] of the Caucasus: (1) Meghri (AR), Zangezur-Mountain (AR, AZ) and Marakan-Kiamaky (IR), where leopard reproduction was confirmed in the past years (Fig. 2.1; Breitenmoser et al. 2017). This is clearly an increasing trend, likely as a consequence of better wildlife protection in general. (2) In Talysh-Zuvand-Mountains (AZ), where a female with cubs was camera-trapped in 2016, after many years of known leopard presence, but with no confirmed record of reproduction until then (Fig. 2.1; Breitenmoser et al. 2017). (3) In the western Greater Caucasus in the Kavkazskiy Biosphere Reserve east of Sochi (RU), where the first three leopards were reintroduced (no reproduction yet) (Fig. 2.1; Hart-

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[1] 56 Priority Conservation Areas covering about 24% of the Ecoregion were delineated for the Ecoregion Conservation Plan "in order to focus conservation actions on the most important areas for biodiversity conservation" (ECP 2012).

mann et al. 2016, Rozhnov et al. 2017). The situation in the central-eastern part of the Greater Caucasus, Khevi-Tusheti and Lagodekhi-Zagatala-West Dagestan (AZ, GEO, RU) is still unclear, but for the entire remaining Caucasus, the leopard must be considered absent.

A more detailed review of surveys since 2002 can be found in Breitenmoser et al. (2014b).
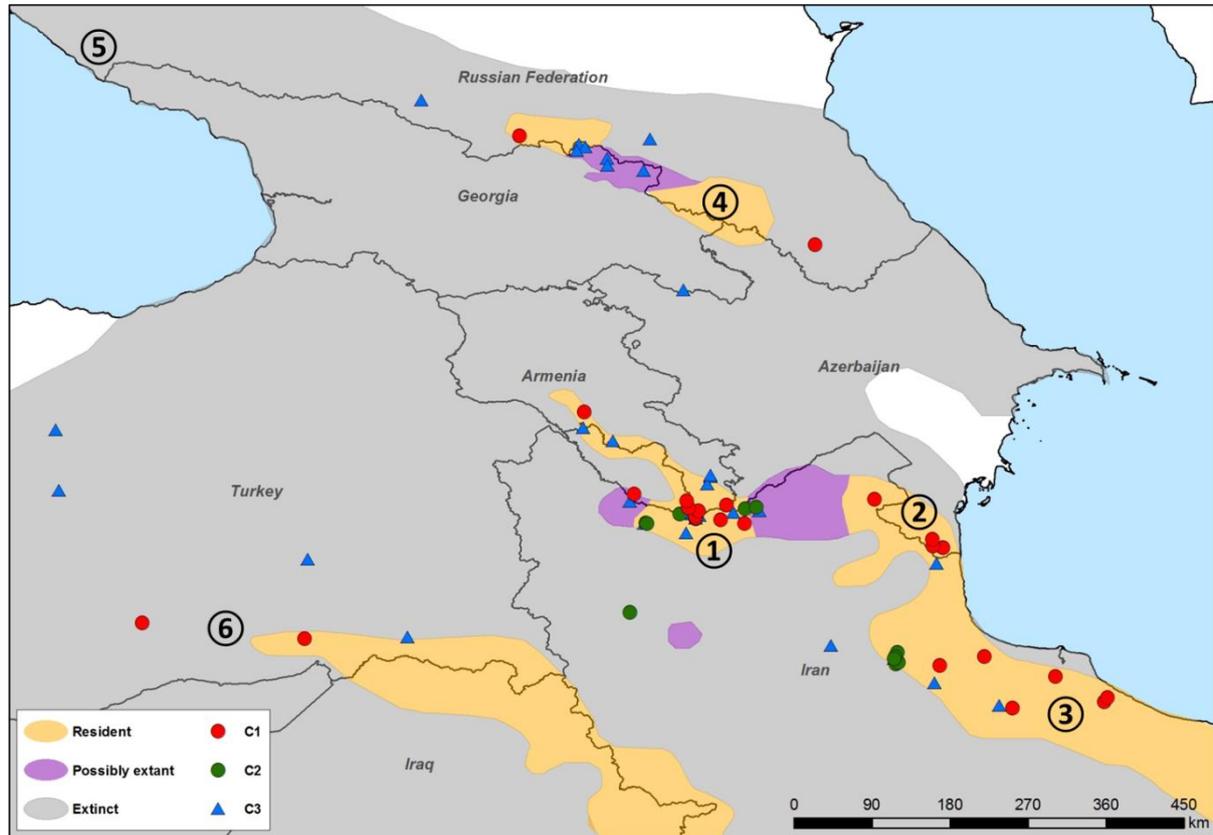

Fig. 2.1. Distribution of leopard in the Caucasus ecoregion. The coloured shapes indicate the distribution according to the IUCN Red List assessment (Stein et al. 2016). Yellow = Resident, purple = Possibly extant, grey = Extinct (i.e. historic distribution). Point distribution records from 2007–2014 were collected for the expert workshop 2014 in Tbilisi, Georgia (Breitenmoser et al. 2014a) and were categorised according to SCALP (Status and Conservation of the Alpine Lynx Population). Red dots, C1 = "Hard facts" such as leopards found dead, images, captured animals or genetic records; green dots, C2 = verified reports from trained people such as kills of livestock and wild animals, tracks; blue triangles, C3 = kills, tracks and scats that are not verified, and signs that are not verifiable such as animal sounds or sight observations.

① Meghri (AR), Zangezur Mountain (AR, AZ) and Marakan-Kiamaki Priority Conservation Area (IR). Reproduction confirmed, population probably isolated.

② Talysh-Zuvand Priority Conservation Area (AZ). Reproduction confirmed. Connectivity to Alborz population.

③ Alborz population (IR). Crucial source population for the Caucasus. Western-most confirmed reproduction in Deylaman-Dorfak no-hunting area (M. Soofi pers. comm.).

④ Khevi-Tusheti and Lagodekhi-Zagatala-West Dagestan (AZ, GE, RU). Rare, scattered observations. No confirmed reproduction.

⑤ Reintroduction project in Caucasian Biosphere Reserve (RU) with captive-bred animals. First release of 3 animals in 2016 (Hartmann et al. 2016, Rozhnov et al. 2017).

⑥ The two C1 observations in Turkey consist of 2 dead individuals (Breitenmoser et al. 2014a, Avgan et al. 2016). All recent observations in Turkey belong to the Zagros population, not the Caucasus ecoregion.

3 Structure of the Strategy and workshop procedures

The principle structure of the *Strategy* (Chapter 5) has not changed and follows the recommendations for strategic planning for species conservation of IUCN (IUCN/SSC 2008a, b). It follows the ZOPP-structure (see Box 1 in the Strategy 2007; Breitenmoser-Würsten et al. 2007), which can be easily translated into the logical framework (LogFrame) table for more detailed planning (Breitenmoser et al. 2015).

The guiding statements – the Vision and the Goal – were retained from the *Strategy 2007*, as they were considered to still be valid. The Objectives have been revised and adapted where needed; the *Strategy 2017* now presents 10 Objectives compared to 11 in the *Strategy 2007*. These 10 Objectives are concretised by 29 Results (synonym to "Targets" in the *Strategy 2007*) and should be implemented through 76 Activities (Chapter 5, 6).

Threats, Gaps, and Enabling Conditions as presented in the Strategy 2007 were found to be mostly still valid, and hence the problem analysis was not repeated in detail in the workshop in April 2017, but only superficially (Chapter 4). We refer to the *Strategy 2007* (Breitenmoser-Würsten et al. 2007) for the full problem analysis.

During the workshop, the plenary was repeatedly split into 4 working groups, which dealt with the following topics:

1. Species and Populations (Objectives 1, 2, 3);
2. Important Places – Habitat and Corridors (Objectives 4, 5);
3. Human Dimension and Socio-economic Circumstances (Objectives 6, 7);
4. Policy, Legislation and International Cooperation (Objectives 8, 9, 10).

After the workshop, a Drafting Team compiled the results from the Working Groups and the plenary discussions and compiled the first draft of the new Strategy that was then submitted to all workshop participants (Appendix I) for review. The revised version is this document, the 2017 Version of the *Strategy for the Conservation of the Leopard in the Caucasus Ecoregion*.

With the assessment at the expert workshop in 2014 and the revision and the release of the updated *Strategy 2017*, the cycle for the strategic planning for the conservation of the leopard in the Caucasus has been completed (Fig. 3.1). The Strategy 2017 must now be concretised in more elaborated work plans and in National Action Plans (Step 4 in Fig. 3.1), and then implemented (Step 5) for the next phase of the programme for the conservation and recovery of the leopard in the Caucasus.
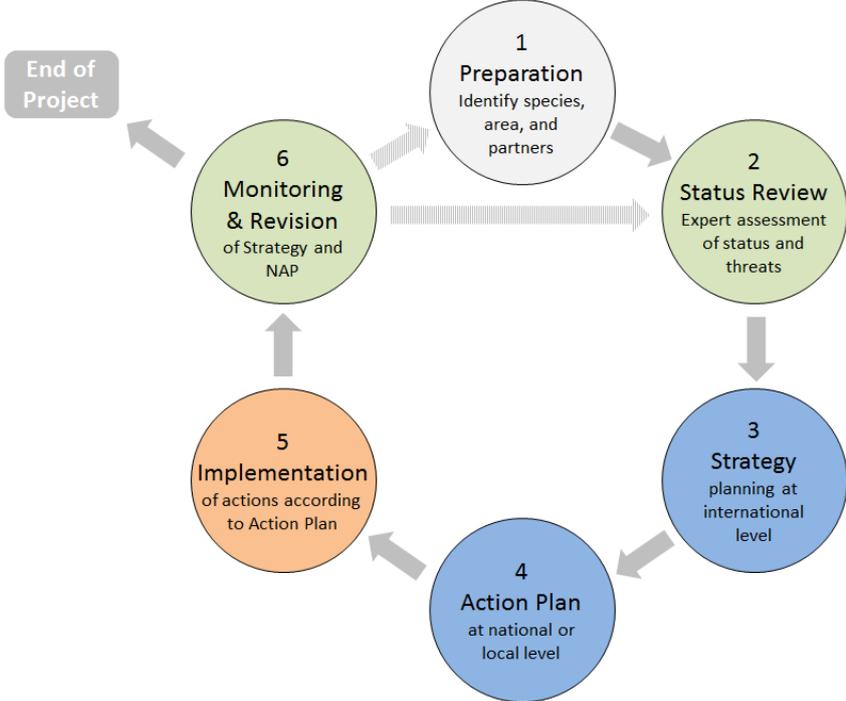
Fig. 3.1. Adaptive Project Cycle for the strategic planning in species conservation. Source: Breitenmoser et al. 2015.

4 Problem analysis

The in-depth problem analysis was performed by working groups for the *Strategy 2007*. The threats (Table 4.1) and gaps (Table 4.2) were reviewed in a plenary discussion for the *Strategy 2017*.

Table 4.1. List of threats.

Species and Populations
    Poaching of leopards
    Poaching of wild prey
    Diseases transmission from livestock to wild prey (wild boar, Caucasian tur, bezoar goat, Gmelin's mouflon)
    Disturbance through border fortifications and presence of military and troops' training in border areas

Important Places – Habitat and Corridors
    Deforestation
    Overgrazing / competition between livestock and wild prey
    Agriculture expansion / land conversion
    Infrastructure development
        Road Construction
        Mining

Human Dimension and Socio-economic Circumstances
    Erosion of customary knowledge and relations with nature
    Defense of livestock (retaliatory killing)

Policy, Legislation and International Cooperation
    Political instability (to be addressed long-term)
    Poor law enforcement and patrolling
    Low international cooperation
    Lack of adequate policy and legislation

The root causes behind the threats were identified in the *Ecoregion Conservation Plan for the Caucasus* (ECP 2012):

- "The political agenda is dominated by the drive for rapid economic growth, which takes precedence over environmental and social concerns.
- Poverty and resulting direct dependence from natural resources are forcing rural people to overuse forests and pastures and to poach wild animals.
- Awareness of the importance of conserving biodiversity is still at a low level, especially among rural people and other users of natural resources.
- Lack of transparency in the development of strategies and projects and weak spatial planning and environmental assessment instruments leads to lack of accountability for negative impacts of economic development on biodiversity.
- Under-financed sector administrations, capacity gaps, unclear delineation of responsibilities result in poor coordination between government agencies; integrated and cross-sectoral approaches are rarely applied.
- Adequate systems for monitoring of natural resources management and sector-based studies are not in place.

- Misconceptions of understanding of the contribution/benefits of ecosystems provisioning, regulating and supporting to economic growth, poverty alleviation and sustainable development.
- Limited awareness on significant benefits and values of Protected Areas at local and national levels."

The country matrix problem analysis of the *Strategy 2007* was not repeated for the *Strategy 2017*. The distinction of very important/urgent, important and not important/not applicable threats and gaps will need to be performed for the development of the National Action Plans. Moreover, Table 4.1 lists only threats of ecoregional/transboundary concern. Threats with a very local importance (e.g. fire) will need to be considered in the National Action Plans where appropriate.

Contrary to the *Strategy 2007*, the threat "Decline in prey base" is not listed anymore in the *Strategy 2017*. This problem has not entirely been resolved, but the plenary agreed that this threat is simply the consequence of poaching, diseases and competition, which are all still listed separately.

Table 4.2. List of knowledge gaps and shortcomings.

Species and Populations
Lack of knowledge exchange
Exact distribution unclear
Insufficient information on leopard population structure
Lack of knowledge on wild prey abundance and availability
No unified monitoring and research methods for leopard and prey
Incomplete knowledge on effective compensation mechanisms
Unsatisfactory understanding on influence of diseases
Insufficient local expertise in biology of leopard
Gap analysis of leopard ecology

Important Places – Habitat and Corridors
Limited information on corridors and core areas for leopard meta-population
Insufficient information on current habitat status suitable for leopard
Insufficient information on spatial structure of prey populations
Lack of research on the ground on leopard and habitat interaction
No common habitat classification standard in the Caucasus

Human Dimension and Socio-economic Circumstances
Very limited information on human-leopard conflicts
Poor economic value of wildlife and nature
Unclear role of community conserved areas
Lack of partnership approaches and engagement of stakeholders in governance and management
Lack of communication and information sharing

Policy, Legislation and International Cooperation
Low awareness of some stakeholders and the general public
Weak environmental education
Insufficient information on illegal trade with derivatives
Lack of knowledge of national legislation

5 Conservation Strategy

The **Vision** and **Goal** were retained from the *Strategy 2007*, as the workshop participants agreed that they are still valid. The vision is a long-term idealised idea, whereas the goal is a more concretised version of this that should be reached within 20 years. The **Objectives** present strategic targets to be reached in the next 10 years. They were reviewed and adapted where needed. The *Strategy 2017* now lists 10 Objectives, compared to 11 Objectives in the *Strategy 2007*. All **Results** (called "Targets" in the *Strategy 2007*) were revisited and many were updated, as well as the **Activities**, which are, based on the experience of the past 10 years, now much more practical. Objectives, Results and Activities are presented on the following pages according to the headings (1) *Species and Populations*, (2) *Important Places – Habitat and Corridors*, (3) *Human Dimension and Socio-economic Circumstances*, and (4) *Policy, Legislation and International Cooperation*.

Vision

Leopards and all wildlife prosper in natural habitats across the Caucasus ecoregion in harmony with people.

Goal

Ensure the conservation and sustainable management of viable meta-populations of leopard and wild prey and their habitats, and build sustainable coexistence mechanisms with local communities across the Caucasus ecoregion.

Objectives

Objective 1. To increase the viability of the leopard and prey populations in the ecoregion

Objective 2. To continue survey for leopards and wild prey across the ecoregion and to establish a joint standardised monitoring system and research programme, and a central database

Objective 3. To promote the foundation of new leopard populations through reintroduction

Objective 4. To establish effectively managed networks of protected areas and corridors for the conservation of leopard in Priority Conservation Areas for leopard

Objective 5. To improve leopard and prey protection outside of protected areas

Objective 6. To ensure long term support from local communities through minimising human-leopard conflicts and creating mechanisms for involvement of local people

Objective 7. To ensure that awareness, education and training (capacity development) for the conservation of the leopard in the Caucasus is improved for target groups and in the Priority Conservation Areas for leopard

Objective 8. To strengthen international, regional and transboundary cooperation for leopard conservation

Objective 9. To optimise existing policies and if necessary develop new policies

Objective 10. To improve and coordinate efforts to secure international funding for conservation activities for the leopard in the Caucasus

Objectives, Results[2] and Activities

[Square brackets with arrow → hint to related Objectives, Results or Activities, which should be considered for synergistic implementation of the activity.]

Species and Populations

Objective 1. To increase the viability of the leopard and prey populations in the ecoregion

Result 1.1. Existing leopard and its wild prey populations are stabilised or increasing by 2022

Activity 1.1.1. Make periodic censuses of existing leopard and prey populations

Activity 1.1.2. Quantify poaching of all wildlife in Priority Conservation Areas for leopard

Activity 1.1.3. Create caretaker networks[3] and anti-poaching units in leopard habitat areas

Result 1.2. Priority Conservation Areas for leopard have been identified for all countries by 2022[4] [→ R-4.2, R-5.1]

Activity 1.2.1. Identify the essential and consistent parameters that characterise Priority Conservation Areas for leopard

Activity 1.2.2. Map the most important Priority Conservation Areas [→ A-4.2.1]

Activity 1.2.3. Identify the main threats for each Priority Conservation Area for leopard

Result 1.3. Important corridors are identified and management activities are proposed and implementation is initiated by 2022[4] [→ R-5.1]

Activity 1.3.1. Identify and map important corridors

Activity 1.3.2. Identify threats, assess their impact and define mitigation measures for corridors (environmental assessment at national level)

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[2] Synonym to the term "Targets" in the 2007 version of the *Strategy*.

[3] Network of volunteers from villages, who support leopard monitoring. They will receive training and necessary equipment, e.g. from WWF.

[4] See also "Annex 2. Priority Conservation Areas and Corridors in the Caucasus Ecoregion" in ECP (2012)

Objective 2. To continue survey for leopards and wild prey across the ecoregion and to establish a joint standardised monitoring system and research programme, and a central database

Result 2.1. Survey of leopards and its prey is completed for Priority Conservation Areas for leopard in the ecoregion by 2022

Activity 2.1.1. Identify Priority Conservation Areas [→ A-1.2.2] to be surveyed until 2020

Activity 2.1.2. Secure governmental (national or regional) support and endorsement to conduct surveys in Priority Conservation Areas where necessary

Activity 2.1.3. Conduct survey of leopard and prey species in all identified Priority Conservation Areas for leopard currently not yet surveyed [→ A-1.1.1]

Result 2.2. A common monitoring system for leopards and prey is developed and tested by 2020

Activity 2.2.1. Develop standardised monitoring guidelines for leopards and its wild prey [→ A-1.1.1]

Activity 2.2.2. Develop a joint database to collect data on leopards and other key species (co-predators and wild prey species)

Activity 2.2.3. Develop an interactive platform allowing the exchange of information (monitoring methods, field protocols etc.) among local experts [→ A-7.4.1]

Activity 2.2.4. Find and train experts in each range country for managing monitoring activities and for consolidating and homogenising data collected [→ A-7.3.3]

Activity 2.2.5. Find and train personnel for implementing on-the-ground monitoring activities in all Priority Conservation Areas for leopard [→ A-7.3.1, A-7.3.2]

Activity 2.2.6 Establish monitoring of leopards, prey, and other large carnivores [→ A-1.1.1] according to the standardised methodology, and a research programme [→ A-2.3.2] on interactions between leopard and other wildlife species

Result 2.3. A coordinated research programme on leopards and other relevant wildlife species is developed and started by 2020

Activity 2.3.1. Determine research gaps and priorities for each country and the entire ecoregion

Activity 2.3.2. Develop (coordinated) research programmes addressing the knowledge gaps identified [→ A-2.3.1]

Objective 3. To promote the foundation of new leopard populations through reintroduction

Result 3.1. A report on the feasibility of reintroduction of leopards in all (interested) countries in the Caucasus ecoregion is produced by 2020

Activity 3.1.1. Establish a task force with experts from all countries to produce a feasibility study (scientific report) for leopard reintroduction in the ecoregion

Activity 3.1.2. Define a standardised set of parameters and agree on a (generic) approach allowing producing consistent habitat and corridor models for the entire ecoregion

Activity 3.1.3. Produce a habitat and corridor map based on various modelling approaches (including potential and current prey availability) for the Ecoregion

Activity 3.1.4. Produce a metapopulation model based on the habitat and corridor model and including (generic) information on socio-economic aspects and possible conflicts/support

Result 3.2. A breeding plan for providing leopards for reintroductions in the Caucasus and protocols for the training and release is produced (in Russian and English) by the end of 2018

Activity 3.2.1. Produce and implement a plan for the breeding of leopards for the reintroduction projects[5]

Activity 3.2.2. Produce guidelines and protocols for the husbandry (incl. health aspects), enrichment, training and evaluation of leopards for reintroduction projects for EEP zoos and for specific breeding/training centres

Result 3.3. Guidelines for the management of the reintroduced populations and a handbook for the post-release monitoring of the released animals and the new populations are produced by 2018

Activity 3.3.1. Produce guidelines for the monitoring of released leopards (individuals) and for the consistent monitoring of the newly created populations

Activity 3.3.2. Develop recommendations for the long-term monitoring and management of the reintroduced populations and their integration into the future metapopulation in the Caucasus

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[5] Including the EAZA Persian Leopard EEP facilities, the Sochi Leopard Breeding Centre, zoos in the Caucasus countries and new facilities meant to breed leopards for reintroduction.

Important Places – Habitat and Corridors

Objective 4. To establish effectively managed networks of protected areas and corridors for the conservation of leopard in Priority Conservation Areas for leopard

Result 4.1. Management effectiveness of protected areas is assessed by 2020

Activity 4.1.1. Apply METT[6] or similar protocols to produce baseline assessments of the management effectiveness of protected areas by 2019, starting with Priority Conservation Areas for leopard and submit the results of the assessment to the relevant authorities [→ R-1.2]

Activity 4.1.2. Repeat evaluation every 3 years to document progress

Result 4.2. Initiate establishment of new protected areas within leopard priority areas by 2022

Activity 4.2.1. Identify potential new Protected Areas [→ R-1.2, R-1.3]

Activity 4.2.2. Initiate establishing of new or upgrading of existing protected areas according to National Action Plan and national legislation

Result 4.3. Trans-boundary leopard and prey species conservation, monitoring and research is developed and implemented for leopard conservation by 2022 [→ R-8.2]

Activity 4.3.1. Institutions involved in leopard conservation prepare at least one project proposal for a transboundary project in the ecoregion and apply for funding

Activity 4.3.2. Institutions involved in leopard conservation in neighbouring countries prepare at least one transboundary cooperation agreement and submit it to their governments [→ R-2.2, R-2.3]

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[6] METT, Management Effectiveness Tracking Tool, is a protocol developed by WWF/World Bank based on IUCN-WCPA framework.

Objective 5. To improve leopard and prey protection outside of protected areas

Result 5.1. Management plans for the Priority Conservation Areas for leopard are developed by 2022

Activity 5.1.1. Identify the management gaps for each Priority Conservation Area for leopard [R-1.2]

Activity 5.1.2. Develop and implement conservation management plans for the Priority Conservation Areas for leopard [R-1.2]

Result 5.2. The local communities, stakeholders and authorities within the Priority Conservation Areas for leopard are aware of the importance of leopard conservation by 2022 [cf. Objective 7]

Activity 5.2.1. Publish and distribute documents and/or visual training materials to promote leopard and wildlife conservation [$\rightarrow$ R-7.1–4]

Activity 5.2.2. Perform capacity building activities for local stakeholders and (wildlife) officers (including border guards) [$\rightarrow$ R-7.1, R-7.3]

Activity 5.2.3. Undertake repeatedly media activities [$\rightarrow$ R-7.1]

Activity 5.2.4. Establish school training programs [$\rightarrow$ R-7.2, A-7.2.1]

Result 5.3. Model projects for sustainable livelihood related to leopard and its prey species (e.g. ecotourism) are developed and implemented by 2022 [cf. Objective 6]

Activity 5.3.1. Institutions involved in leopard conservation in each country perform a feasibility study and identifies at least one area for a potential ecotourism or other sustainable livelihood project by 2019

Activity 5.3.2. Each country has implemented one ecotourism or other sustainable livelihood project by 2022 [$\rightarrow$ R-6.3]

Human Dimension and Socio-economic Circumstances

Objective 6. To ensure long term support from local communities through minimising human-leopard conflicts and creating mechanisms for involvement of local people

Result 6.1. Human-leopard conflict in the Priority Conservation Areas for leopard are reduced by 20% by 2022

Activity 6.1.1. Assess the extent of the human-leopard conflict [→ A-1.1.2, A-1.2.3]

Activity 6.1.2. Develop and implement a toolkit for minimisation of human-leopard conflict [→ A-1.1.3, A-6.1.4]

Activity 6.1.3. Create a regional database to monitor and share information on human-leopard conflict

Activity 6.1.4. Conduct feasibility studies in each country to prepare guidelines for compensation or mitigation measures

Result 6.2. At least 20% of the local communities in the Priority Conservation Areas for leopard are involved in leopard conservation activities by 2022

Activity 6.2.1. Perform the socio-economic assessments to identify the target communities to be involved [→ R-5.3]

Activity 6.2.2. Identify conservation activities where local communities can be involved [→ A-5.3.1]

Activity 6.2.3. Develop and implement a participatory programme for local communities [→ A-1.1.3, A-5.3.2]

Result 6.3. Sustainable livelihoods are ensured for at least 10% of the communities in the Priority Conservation Areas for leopard by 2022

Activity 6.3.1. Identify conservation activities that can contribute to improving sustainable livelihoods [→ A-5.3.1]

Activity 6.3.2. Develop and implement a programme for improving sustainable livelihoods [→ A-5.3.2]

Objective 7. To ensure that awareness, education and training (capacity development) for the conservation of the leopard in the Caucasus is improved for target groups and in the Priority Conservation Areas for leopard

Result 7.1. Awareness raising activities addressing different target groups are increased by 30% by 2022 [→ R-5.2]

Activity 7.1.1. Identify the target groups in Priority Conservation Areas for leopard and assess their level of awareness (baseline)

Activity 7.1.2. Develop and implement awareness raising activities addressing the needs of the identified target groups [→ A-5.2.2]

Result 7.2. Environmental education programmes are developed and implemented in at least 10% of schools and 50% undergraduate courses in Life Sciences by 2022

Activity 7.2.1. Develop and implement education school programmes for different age groups [→ A-5.2.4]

Activity 7.2.2. Develop and implement leopard conservation lectures, wildlife conservation and monitoring workshops, etc. for (undergraduate) students

Result 7.3. Training of professional skills needed for leopard conservation is increased by at least 20% by 2022

Activity 7.3.1. Review available training concepts and tools and assess their usefulness and application (baseline)

Activity 7.3.2. Develop and implement a training programme for rangers and PA managers on anti-poaching, law enforcement, monitoring, and conflict resolution [→ A-1.1.3]

Activity 7.3.3. Develop and implement a training programme for education staff/teachers on leopard conservation [→ A-7.2.1, A-7.2.2]

Activity 7.3.4. Develop and implement a training programme to educate wildlife biologists in research and monitoring for leopard conservation [→ A-7.2.2]

Result 7.4. A depository for sharing awareness raising, education and training programmes and material is available by 2020

Activity 7.4.1. Develop a depository for sharing awareness raising, education and training programmes and material [→ A-2.2.3]

Activity 7.4.2. All materials for awareness raising, education and training are shared in the depository

Policy, Legislation and International Cooperation

Objective 8. To strengthen international, regional and transboundary cooperation for leopard con-
servation

Result 8.1. Illegal trans-border trade of leopards and derivatives is suppressed immediately
wherever it occurs

Activity 8.1.1. Optimise exchange of information between national custom services and
other relevant governmental bodies including international institutions
(TRAFFIC, Interpol) on illegal movement of leopard parts and derivatives by
2021 by (1) assessing existing practices of information exchange between the
institutions and (2) addressing gaps identified and fields of improvement

Activity 8.1.2. Train customs and border services by 2020 in the identification of species in-
cluded in CITES and national protected species lists, focusing on leopard and
its prey species [→ A-5.2.2]

Result 8.2. Transboundary agreement(s) on monitoring is/are in place and implementation initi-
ated in at least one Priority Conservation Area for leopard by 2022 [→ R-4.3]

Activity 8.2.1. Identify transboundary Priority Conservation Areas for leopard[7] [→ A-1.2.2,
A-4.2.1]

Activity 8.2.2. Form working group(s) at appropriate level to develop common vision(s) and
programme(s)

Activity 8.2.3. Initiate implementation of transboundary program(s) on leopard conserva-
tion and track progress [→ A-2.1.1, A-4.2.2]

Result 8.3. An expert group for coordination of regional monitoring of leopards and its prey spe-
cies in the Caucasus is established and functioning effectively by the end of 2018
[→ R-2.2]

Activity 8.3.1. IUCN/SSC Cat Specialist Group and WWF in coordination with national rele-
vant stakeholders (government, scientists) coordinate the (establishing of
the) working group

Activity 8.3.2. Establish working group, organise work programme and meeting at least
once a year

Activity 8.3.3. Working group prepares annual regional monitoring report and distribute
among relevant stakeholders

Result 8.4. Every third year, starting from 2020, regional stakeholders and/or expert meeting is
organised to track progress of implementation of Regional Strategy and coordination
of all other relevant issues

Activity 8.4.1. WWF Caucasus Programme organises regional stakeholders and/or expert
meetings

Activity 8.4.2. Review the strategy, prepare progress reports and adaptive proposals and in-
form relevant institutions and stakeholders

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[7] See also "Annex 2. Priority Conservation Areas and Corridors in the Caucasus Ecoregion" in ECP (2012)

Objective 9. To optimise existing policies and if necessary develop new policies

Result 9.1. National Action Plans (NAPs) and other related programmes for leopard conservation are revised and up-dated for at least three countries (AR, AZ, GE) in compliance with the new Regional Leopard Conservation Strategy by the end of 2018

Activity 9.1.1. Form national working groups in all eco-regional countries and up-date existing NAPs or develop new NAPs

Activity 9.1.2. Relevant governmental bodies approve updated/new NAPs

Result 9.2. Every third year, starting from 2020, national stakeholders and/or expert meetings are organised to track progress of implementation of NAPs and coordination of all other relevant issues on national level [→ R-8.4]

Activity 9.2.1. Organise national stakeholders and/or expert meetings

Activity 9.2.2. Review NAPs, considering the reviewed regional leopard strategy [→ A-8.4.2, A-9.1.1]

Activity 9.2.3. Prepare adaptive proposals for NAPs, revise, adopt and implement the up-dated versions

Objective 10. To improve and coordinate efforts to secure international funding for conservation activities for the leopard in the Caucasus

Result 10.1. By 2022, financial support from governmental and private donors to leopard conservation is increased by at least 50%

Activity 10.1.1. Perform information campaigns and publicity and awareness raising events and activities for donor community

Activity 10.1.2. Institutions involved in leopard conservation in the Caucasus inform each other on their fund-raising strategy and coordinate international fund-raising as far as possible to minimise competition

6 Implementation of the Strategy and National Action Plans

The *Strategy 2017* for the conservation of the leopard in the Caucasus identifies 10 Objectives, 29 Results and 76 Activities. Results should be S.M.A.R.T. (specific – measurable – achievable – relevant – time-bound) as much as possible. This, however, must be refined in the National Action Plans. Of the 76 Activities, 36 need to be addressed mainly at international and 45 mainly at national level (Table 6.1). Several Activities need to be considered at the eco-regional level and at the national or local level, and some would best be developed as a joined project of all partner countries, but then adapted to and implemented at national level, e.g. standardised protocols, educational tools, or training courses.

Table 6.1. Number of Results and Activities per Objective and level (national/international) of main implementation. Some Activities need to be addressed at an international (e.g. development of protocols) and at national level (e.g. implementation of protocols).

Objective	# of Results	# of Activities	Activities to be implemented mainly at level:	
			international	national
1. Population viability of leopard and prey	3	8	1.2.1; 1.2.2; 1.3.1	1.1.1; 1.1.2; 1.1.3; 1.2.3; 1.3.2
2. Monitoring of leopard and prey	3	11	2.1.1; 2.2.1; 2.2.2; 2.2.3; 2.3.1; 2.3.2	2.1.2; 2.1.3; 2.2.4; 2.2.5; 2.2.6; 2.3.1
3. Reintroduction	3	7	3.1.1; 3.1.2; 3.1.1; 3.2.1; 3.2.2; 3.3.1; 3.3.2	–
4. Protected areas and corridors	3	7	4.3.1; 4.3.2	4.4.1; 4.1.2; 4.1.3; 4.2.1; 4.2.2
5. Protection outside protected areas	3	8	5.2.1; 5.2.3	5.1.1; 5.1.2; 5.2.1; 5.2.2; 5.2.3; 5.2.4; 5.3.1; 5.3.2
6. Support from local communities	3	9	6.1.2; 6.1.3; 6.3.1	6.1.1; 6.1.2; 6.1.4; 6.2.1; 6.2.2; 6.2.3; 6.3.2
7. Capacity development	4	9	7.2.1; 7.2.2; 7.3.1; 7.3.2; 7.3.3; 7.4.1; 7.4.2	7.1.1; 7.1.2; 7.3.1; 7.3.2; 7.3.3
8. International cooperation	4	10	8.1.1; 8.2.1; 8.2.2; 8.2.3	8.1.1; 8.1.2; 8.2.3
9. Optimise policy	2	5	–	9.1.1; 9.1.2; 9.2.1; 9.2.2; 9.2.3
10. Improve fund-raising	1	2	10.1.1; 10.1.2	10.1.2
Total	29	76	(36)	(45)

Implementation and revision of the Strategy at eco-regional level

The *Strategy 2017* provides a conceptual framework for the elaboration of more detailed action plans and work plans. We suggest that a work plan – or possibly several work plans – should also be developed for the eco-regional and international Results and the implementation of the respective Activities (Table 6.1). This is best done by establishing Working Groups or Task Forces for specific Results, for instance Result 2.2 and Result 8.3, aiming for the development of a common monitoring system under the coordination of a pan-Caucasian working group.

Each working group should develop, based on the relevant Results and Activities of the Strategy 2017 presented in Chapter 5 and summarised in Table 6.1, a more specific work plan with a logical frame-

work (LogFrame; see e.g. Breitenmoser et al. 2015) identifying indicators and other relevant parameters for each Result, and defining actors/responsibilities, timeline, methodology, and budget for each Activity. Work plans of Working Groups and Task Forces tackling specific Results must be shared with the Tbilisi Strategy Workshop 2017 participants and with all institutions involved in leopard conservation in the Caucasus.

Another area where international cooperation is needed is research. Although all *in situ* research projects will have to be implemented locally in a particular study area, the results will be of general interest and should be applied at a much wider geographic scope. The participants at the Tbilisi Workshop in April 2017 have identified topics that should be addressed in specific research projects to provide a better understanding for the implementation of conservation measures. The result of this review is summarised in Table 6.2 and should be considered by the respective working groups.

Table 6.2. Key research topics as defined during the Strategy Workshop, Tbilisi, 24–25 April 2017.

No.	Research issue	Objective	Results	Activities
	Species And Populations:			
1	Assessment of monitoring methods in terms of efficiency and reliability in different habitats	1, 2	2.2	2.2.1
2	Leopard and prey interactions (including diet)	1, 2, 3	2.2	2.2.6–7
3	Leopard and other predators interactions (including diet)	1, 2, 3	2.2	2.2.8
4	Habitat characteristics (preference) of leopard and main prey	1, 2, 3	2.1, 2.2	All
5	Elaboration of presence and densities of leopard and main prey	1, 2, 3	2.1, 2.2	All
6	Movement ecology & dispersal	2, 3, 4, 5	2.1, 2.2	2.1.1–4 2.2.1–6
7	Population genetics of leopard in the region (especially related to reintroduction)	1, 3		
	Important places – habitat and corridors:			
8	Identification of reintroduction sites based on habitat structure (core areas and corridors), prey availability (carrying capacity) and human pressures	3		
9	Meta-population viability analysis (spatially explicit)	1, 2, 4, 5	2.1, 2.2	All
	Human dimension and socio-economic circumstances:			
10	Threat assessment (including effects of livestock on leopard survival, etc.)	3, 6, 7		
11	Understanding variations in the human-leopard conflict and attitudes towards leopard among areas and actors	6, 7		
12	Effect of leopard and leopard conservation on local livelihood	6, 7		
13	Assessment of human-leopard conflict mitigation methods	6, 7		

Review and revision of the Strategy 2017: Task Forces, Working Groups, and the (national) institutions involved in leopard conservation should continuously consider and evaluate the *Strategy*. The lifespan of such a strategy is about 5 years; the *Strategy 2017* should hence be reassessed and updated not later than 2022.

Implementation of the Strategy through National Action Plans

Based on the *Strategy 2007* (Breitenmoser-Würsten et al. 2007), the three central Caucasian countries Armenia (Anonymous 2008), Azerbaijan (MENR 2009), and Georgia (Zazanashvili et al. 2010) developed their specific National Action Plans (NAPs) for the conservation of the leopard. Furthermore, the Russian Federation has developed a conceptual plan for the reintroduction of the leopard in the north-western Greater Caucasus (Rozhnov & Lukarevsky 2008). The effectiveness of the implementation of the NAPs was reviewed in a questionnaire and an expert workshop in Tbilisi in 2014 (Breitenmoser et al. 2014a). The existing plans should now be updated, or missing plans be developed, based on the assessment of the 2014 expert workshop and considering the proposed Results and Activities in the *Strategy 2017*.

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