A photograph of a leopard walking through a rocky, brushy landscape. The leopard is in the foreground, slightly out of focus, and is walking towards the right. The background consists of dry, yellowish-brown vegetation and scattered grey rocks.

**LEOPARD
IN THE SOUTH CAUCASUS**
CONSERVATION SUMMARY SINCE 2000

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INTRODUCTION

One of the most biologically rich ecoregions on earth, the Caucasus is ranked among the planet's 36 most diverse and endangered hotspots (Mittermeier et al. 2004). The Caucasus is also a globally significant centre of cultural diversity, where a multitude of ethnic groups and languages intermingle over a relatively small area. The ecoregion covers three South Caucasus countries (Armenia, Azerbaijan and Georgia), North Caucasus part of Russian Federation, north-eastern Turkey and part of north-western Iran. Main mountain ranges include the Greater Caucasus (with the highest peak of the Caucasus being Mt. Elbrus, 5.642 m above sea level), the Lesser Caucasus mountain chain and Talysh Mountains and western part of Alborz Mountains. The 2019 IUCN Red List of Threatened Species (www.redlist.org) identifies 86 species of globally threatened vertebrates in the Caucasus, among them 17 species of mammals, including Leopard (*Panthera pardus*).

The conservation of the rich Caucasian biodiversity is a great challenge and focus of WWF's work in the region: WWF and hundreds of representatives from governments, universities and NGOs of all six Caucasus countries established and developed the Ecoregional Conservation Plan (ECP); today already the third revised and edited version of ECP was produced (Williams et al. 2006; Zazanashvili et al. 2020). The ECP is a comprehensive strategy for action to protect biodiversity, to create landscape connectivity and ecological networks, and to support regional development in the Caucasus. Its purpose is to serve governments as well as national and international organizations as an action guideline for the regional and transboundary levels. At the same time, the ECP is a strategic planning instrument to help governments with the implementation of their obligations towards international conventions, especially the Convention on Biological Diversity (CBD). The Leopard has been identified as one of the top priority species by the ECP.

Leopard in Nakhchivan/Azerbaijan, Dec 2016



LEOPARD CONSERVATION IN THE CAUCASUS UP TO 2000

The first scientific publication on mammals/carnivores in the Caucasus, which includes some information on Leopard occurrence throughout the region appeared at the beginning of the 20th century (Dinnik 1914; Satunin 1915; etc.). Afterwards, a considerable number of scientific publications followed, basically covering the geography of the species based on facts of revealing tracks or skins of killed animals in different parts of the Caucasus. On the other side in the course of the 20th century, actually no research has been carried out devoted to the direct study of the species populations' status, ecology, or conservation issues.

There were no direct field conservation actions aiming at protecting the Leopard during the 20th century as well. However, the Leopard indirectly benefited from the development of protected areas which were mainly created for the conservation of biologically valuable forest ecosystems and the establishment of hunting reserves.

The apparent neglect of the Leopard by the scientific and conservation community in the 20th century is comprehensible only in light of the historic socio-cultural circumstances: most of the Leopard's range in the Caucasus was part of the Soviet Union in which predators such as the Leopard were seen as pests and detrimental to agricultural and livestock production. Therefore, the systematic extermination of Leopards and other predators was encouraged by state authorities through a bounty system. Only retrospectively scientists and conservationists realized the dramatic decline of the Caucasian Leopard population. This decline appeared so severe that from the 1960s until the end of the 20th century when WWF started its investigations, the majority of scientists really doubted the existence of the species in most parts of the Caucasus.

Nevertheless, the only action that has been taken was including the species to the Red Lists/Books of the Caucasus countries. In particular, the first Red List of Georgia including data on the Leopard was approved by the Council of Ministers in 1977. Afterwards, the Red Data Book of Georgia was published (1982). The Leopard was included in the two editions of the Red Data Book of the Russian Federation (1983, 2001), Red Data Books of Armenia (1987) and Azerbaijan (1989). In all publications it was registered as a species under the threat of extinction. With the same status, the Leopard was included in two editions of the Red Data Book of the USSR (1978, 1984). All these documents had uncertain legal basis. It is symptomatic that after publishing of the Red Data Books mentioned above, not a single case of Leopard killing has been officially registered right up to 2002, when the first WWF project started.



In general, it should be noted that during the 20th century there was no adequate attention paid neither to research nor to the conservation of Leopards throughout the Caucasus, which subsequently created the critical situation with regard to the species' population in the region (Zazanashvili et al. 2007).

Leopard family in Nakhchivan, Jan 2019



LEOPARD CONSERVATION IN THE CAUCASUS SINCE 2000

In the 21st century, the situation, both with research and conservation of the Leopard, has fundamentally changed, since the first phase (2001-2005) of WWF's project on Leopard conservation in the South Caucasus has been implemented thanks to support of WWF-Switzerland and personally Dr. Heinz Stalder. Since 2003, WWF-Germany has also actively supported the project.

Despite concern that this globally threatened species, assessed as Vulnerable according to IUCN criteria (Stein et al. 2016), had disappeared from the region altogether, surveys organised in 2002–2005 showed that the Leopard still inhabits four “islands”. These are:

- Nakhchivan/Azerbaijan-southern Armenia-Karadag range, Iran;
- Talysh Mountains of Azerbaijan (and Iran);
- Iori-Ajinour Plateau (south-eastern Georgia-north-western Azerbaijan); and
- Eastern Greater Caucasus (Georgia-Daghestan/Russian Federation).

Considering the results of those surveys, WWF Caucasus Programme Office has focused on assisting governments in establishing new protected areas (PAs), improving their capacity, management effectiveness and monitoring Leopard and its prey species. Particularly, WWF and its donors such as the Critical Ecosystem Partnership Fund, Norwegian Government, and German Government supported Governments of Armenia, Azerbaijan and Georgia in:

- Planning and establishing or extending the following protected areas: Arevik National Park (334 km²), Zangezur Managed Nature Reserve (258 km²) and some smaller protected areas in southern Armenia, Zangezur (428 km²) and Hyrcan National Parks (404 km²), and Akhar-Bakhar section of Illisu State Nature Reserve (50 km²) in Azerbaijan, Pshav-Khevsureti protected areas (National Park, Managed Nature Reserve and some others with a total area of 1.100 km²) in the Eastern Greater Caucasus;
- Establishment of wildlife corridor in Eastern Lesser and Eastern Greater Caucasus together with local population, and caretaker networks consisted of local enthusiasts;
- Improvement of capacity and infrastructure the above mentioned protected areas, as well as in Khosrov Forest and Shikahogh State Nature Reserves in Armenia, and Vashlovani National Park in Georgia.

Apart of these, systematic camera-trapping and field tracking monitoring has been set up, run and developed (today it is perfecting together with specialists from Biogeography Department of Humboldt University of Berlin); number of meetings with local population and number of school campaigns have been organized, etc.

Generally, active involvement of local people in conservation is one of the key elements of WWF projects. Thus, in order to help WWF in Leopard and prey species monitoring and conservation in the Caucasus, a network of Leopard caretakers consisting of 35 local enthusiasts has been formed in Armenia and Azerbaijan. All caretakers have been trained and provided with necessary equipment and software, such as uniforms, binoculars, cameras, laptops, mobile phones, as well as mobile phone application Earthbeat (recently developed by WWF), which helps the caretakers to monitor the animals and ecosystems and send all data to WWF server for further analysis and relevant actions.

The legal basis for Leopard conservation has begun to improve since 2000 as well, when in Azerbaijan “Regulation on Red Data Book” was adopted by the resolution of the Cabinet of Ministers of Azerbaijan. The last revision of the Red List of Georgia was made 2006 and 2014 using the IUCN methodology, and was approved by the Government. New Red Data Books were prepared and published in Armenia (2010) and Azerbaijan (2013). In all these three basic documents Leopard is listed as critically endangered. In addition, penalties for killing the Leopard have been increased many times and today amounts between Euros 3.000-5.000.

Training of the caretakers in the field, Armenia, Sep 2017



In 2007, with the support of the IUCN/SSC Cat Specialist Group, a regional status report was produced in which the above mentioned findings of Leopard distribution were presented (Lukarevsky et al. 2007) and a Caucasus regional strategy for Leopard conservation was prepared based on inputs of national experts (Breitenmoser-Würsten et al. 2007). Development of the strategy was followed by the elaboration of corresponding National Action Plans in Armenia, Azerbaijan and Georgia. The Regional strategy and National Action Plans in turn facilitated further development of conservation actions, especially expansion of PAs and monitoring in those three countries. The strategy was revised in 2017 (Caucasus Leopard Working Group 2017): updating of the National Acton Plan in Armenia is completed and in Azerbaijan is going on.

Leopard named Neo who was born in Nakhchivan, travelled long distance (around 170 km in a direct line) and lives over 3 years in Khosrov Forest State Reserve in Armenia, Feb 2020



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WHAT DO WE KNOW EXACTLY ABOUT THE LEOPARD'S STATUS IN THE CAUCASUS?

One point that we are certain about is that the status of the Leopard is significantly improved in the Eastern Lesser Caucasus Conservation Landscape, which covers the Southern Armenia-Nakhchivan region of Azerbaijan and is linked with Kiamaki Wildlife Refuge in Iran (Askerov et al. 2015). In southern Armenia the first two Leopard photos were obtained and 19 scats collected in 2004-2005 from 3 sites (Khorozyan & Abramov 2007; Khorozyan, Cazon, Malkhasyan, & Abramov 2007). Leopard surveying in the Nakhchivan section of the Eastern Lesser Caucasus brought the first hard evidence as recently as 2012 (Avgan et al. 2012). Since then, because of the hunting ban in Nakhchivan, the establishment of new PAs in the Eastern Lesser Caucasus (see above), and acceleration of monitoring activities under the WWF Programme (and, consequently, the growing population of Leopard here), hundreds of Leopard photo-video materials, as well as a considerable amount of scats, have been collected (Table 1). Recently the number of individuals that inhabit this area was estimated as 20-24 (Askerov et al. 2019), including 10-12 animals living in Kiamaki (Sanei et al. 2016), but it seems that the number of individuals could be even more: such supposition is based on photos depicting the second event of reproduction here – a different mother with two cubs. The first such event was documented in 2016 with three cubs (Breitenmoser et al. 2017). Thus, we can say that the Eastern Lesser Caucasus population is still vulnerable, but quite stable and has a good reproductive potential.

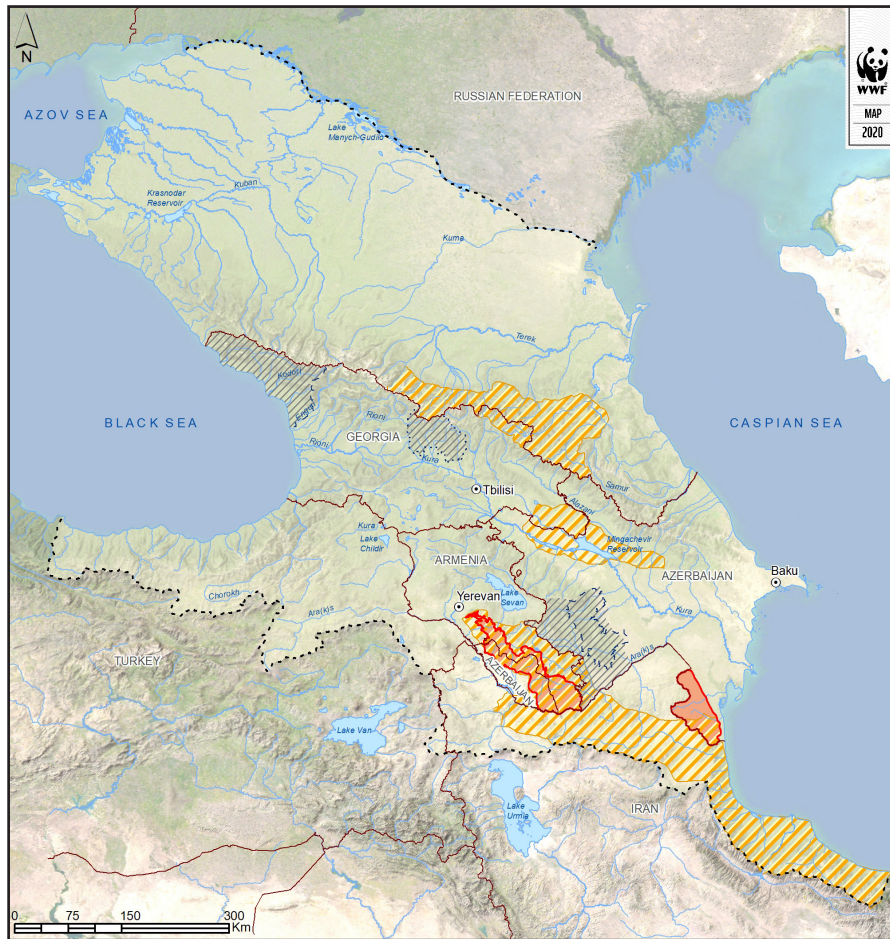
We also know that the second reproductive nucleus in the region is the Talysh mountains of Azerbaijan: two cubs were captured by camera-trap in 2016 (Breitenmoser et al. 2017). On the other hand, this area is more affected by poaching (Askerov et al., 2015; Maharramova et al. 2018) and this may be the main reason why the Leopard population size here is smaller: approximately half of the Eastern Lesser Caucasus population. The question of connecting these two populations via bridge ridges located within north-western Iran is still open and needs more detailed research.

Table 1. Number of photo and video records of Leopard obtained in the period of August 2014 - June 2019 in the South-Eastern Lesser Caucasus (from the Khosrov Reserve to Nakhchivan, see also Fig. 1) and the Talysh Mountains

Area/Time period	Camera-trap sites	Leopard photo / videos	Female with cubs	Identified Leopards	Killed Leopards reported
Nakhchivan, AZ, 11/2014-06/2019	80	251 / 66	10	10	0
Talysh, AZ, 05/2015-06/2019	21	23 / 3	1	6	1
Southern Armenia, 09/2014-06/2019	72	53 / 23	0	8	0

Notes: (a) a sequence of images/footages taken within several minutes at the same site was counted as one photo/video; (b) among four Leopards (2♀ and 2♂) forming 3 coupling combinations, Leopards Eve♀ and Basat♂ are caught together only once, Eve♀ and Araz♂ are caught on two occasions, Burla♀ and Basat♂ – on three occasions; (c) six records of a female with cubs in Nakhchivan show Eve and four records show Burla; (d) several of the same individuals have been recorded in Nakhchivan and in Armenia; three animals have been identified for Armenia that have not been recorded in Nakhchivan; it means that during the observation period the total number of identified individuals for southern Armenia-Nakhchivan/Azerbaijan is not 11+8, but 11+3=14 individuals.

Map of the Leopard's assumed range in the Caucasus



Explanations: (1) The assumed Leopard range in the whole Caucasus Ecoregion is marked with yellow hatching; (2) The assumed range of Leopards reintroduced in north-western Caucasus (from Sochi breeding centre, Russian Federation) is not depicted; (3) Red contoured areas show focal places for WWF's project on the Leopard conservation in South Caucasus covering Leopard breeding areas; (4) Gray hatching marks territories of the current political conflicts.

A small population appears to have survived in the Eastern Greater Caucasus: in February 2015, one individual was occasionally recorded on video in Dagestan/Russian Federation, close to Tlyarata Managed Nature Reserve (Yarovenko & Zazanashvili 2016). Two further sightings were reported in North Ossetia (Interfax 2017). All these events happened within Russian Federation, but very close to Georgia's and Azerbaijan's borders.

Leopard in Nakhchivan, Aug 2019



As for the 4th “island” of Leopard occurrence–Iori plateau and Turianchay State Nature Reserve (eastern Georgia, north-western Azerbaijan), located between the Greater and Lesser Caucasus–one male Leopard was frequently caught by camera-traps in Vashlovani National Park (Georgia) between 2004 and 2008 (Lortkipanidze et al., 2004). Its footprints were also observed on the left bank of the Alazani River in the Akhar-Bakhar section of Ilisu Nature Reserve (Azerbaijan). However, since 2009 this individual has not been recorded again (Presentation of B. Lortkipanidze, NACRES at the regional Leopard conservation workshop, Tbilisi, October 2014). Expert V. Lukarevsky, who surveyed the area in May 2019, has concluded that currently there are no Leopards within the whole of this conservation landscape, which is generally rich in wildlife (see the map above).

Fortunately, the WWF’s project on Leopard conservation in the Caucasus is long-lasting: started in the early 2000s, it successfully continues until today thanks to support coming from WWF-Switzerland and WWF-Germany and perhaps this is the main reason of the project’s success–long-term, regular and well monitored activities are absolutely necessary conditions for reaching visible positive results in large carnivore conservation.

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