

STATUS AND PROTECTION OF GLOBALLY THREATENED SPECIES IN THE CAUCASUS



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**STATUS AND PROTECTION OF
GLOBALLY THREATENED SPECIES
IN THE CAUCASUS**

CEPF Biodiversity Investments in the Caucasus Hotspot 2004-2009

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Executive Summary

The main objectives of the project "Reassessment of the IUCN Red List for amphibians and reptiles of the Caucasus in accordance with IUCN categories and criteria" were i) to collect data in all countries of the Caucasus ecoregion; ii) to identify the conservation status of all species based on the IUCN Red List Categories and Criteria: version 3.1 and the Guidelines for Application of IUCN Red List Criteria at Regional Levels; iii) to identify the most threatened species, and to highlight where the most threatened species are located. The project aimed to further transboundary cooperation as a key component of the long-term program of preservation of biodiversity of the Caucasus at the level of herpetofaunal complexes and especially rare and endangered species. The conservation status of all amphibian and reptile species occurring within the Caucasus Ecoregion was comprehensively assessed during the Global Reptile and Amphibian Assessment in Antalya, 22 – 26 September 2008. As a result, 35 species were classified as Critically Endangered (CR), Extinct Endangered (EN), Vulnerable (VU), Near Threatened (NT), and Data Deficient (DD).

Scope of the Work

Data on the Caucasus amphibians (17 species: 5 species of Caudata and 12 species of Anura) and reptiles (about 90 species: ca. 50 lizard species and 43 snake species, depending on taxonomic point of view) were collected and a gallery of images and distribution maps was compiled. Special attention was paid to Caucasus endemics and species having a Caucasus-Iran-Central Asia distribution. Data on status of each taxon in the past, present and expected future and proposals for conservation status from regional experts were also gathered.

Methodology

The conservation status of all amphibian and reptile species within the Caucasus Ecoregion was discussed during the Global Reptile and Amphibian Assessment in Antalya, 22-26 September 2008. The following points were considered in accordance with Guidelines for Application of IUCN Red List Criteria at Regional Levels (IUCN 2003). 1) species assessed at the regional level; 2) contact with other populations; 3) documentation and publication of regional Red Lists.

The project involved the following steps:

- a) Data were gathered in all countries of the Caucasian ecoregion on species, their distribution, limiting factors, populations, habitat and ecology, life history, breeding strategy, threats and conservation measures, using the most recent data and summarizing monographs (Darevsky 1967; Muskhelishvili 1970; Bannikov et al. 1977; Alekperov 1978; Darevsky and Orlov 1988; Anderson 1999; Kuzmin 1999; Tarkhnishvili and Gokhelashvili 1999; Ananjeva et al. 1997, 1998, 2006; Orlov et al. 2002; Szcerbak 1974, 1993, 2003; Tuniyev et al. 2009, in press).
- b) The status of each taxon in the recent past, the present and in the near future was assessed and presented to IUCN as a part of the supporting documentation. The assessment and confirmation

of status was carried out together with IUCN experts using the software “RAMAS® Red List”, version 2.0 and Guidelines for Application of IUCN Red List Criteria at Regional Levels (IUCN 2003).

- c) All information collected was reviewed, along with the conservation status of each species and its habitat, to develop priorities for conservation. Forms with information on distribution, limiting factors, populations, habitat and ecology, life history, breeding strategy, category of threat and conservation measures were completed, and a photo gallery and distribution maps in ArcView program were compiled.
- d) Species reviews and all recommendations on Red List reassessment of amphibians and reptiles of the Caucasus were submitted to the Species Survival Commission (SSC) of IUCN.

Assessment Results

As a result of the assessment, 35 species were classified as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), or Data Deficient (DD) (Table 1). Of these, 21 taxa are classified in a threatened category (Critically Endangered, Endangered or Vulnerable).

Table 1. Reassessment of the IUCN Red List for amphibians and reptiles of the Caucasus

Species	Category	Criteria	Rationale
<i>Bufo verrucosissimus</i>	NT		Listed as Near Threatened because although it has a wide distribution and a presumed large population, it is likely to be declining rapidly in some areas due to loss of habitat and more recently to increased predation by the invasive raccoon <i>Procyon lotor</i> (introduced in 1970-1980). The rate of decline is probably not sufficient (30%) to qualify for Vulnerable. If action is not taken to prevent the further spread of the raccoon, <i>Bufo verrucosissimus</i> may soon qualify for Vulnerable.
<i>Pelodytes caucasicus</i>	NT		Considered Near Threatened due to population declines resulting from the invasive predatory species <i>Procyon lotor</i> which has recently become considerably more abundant. Additional declines result from habitat destruction (clearing of forests and leaf litter). Current rates of decline are not yet sufficient to qualify for a threatened category.
<i>Mertensiella caucasica</i>	VU	B2ab(ii,iii)	Listed as Vulnerable because its Area of Occupancy is less than 2,000 km ² , its distribution is severely fragmented and it is confined to small streams free of fish; there is also a continuing decline in the extent and quality of its habitat in Turkey and Georgia. The species is undergoing a rapid reduction across its range so it may also qualify for Vulnerable under A3c upon further investigation.
<i>Ommatotriton ophryticus</i>	NT		This species is listed as Near Threatened globally because of the rapid declines in Caucasus populations due to predation from invasive raccoons and collection for the pet trade. In Turkey, populations are declining particularly in the eastern part of its range. Overall, declines are not occurring fast enough to qualify as threatened. Turkey: LC: Least Concern because of its wide range and large population. Dam projects in eastern Turkey represent a significant future threat.
<i>Zamenis persicus</i>	DD		Listed as Data Deficient in view of the absence of recent information on its extent of occurrence, status and ecological requirements.
<i>Natrix megaloccephala</i>	VU	A4ce	Considered to be Vulnerable due to a population decline estimated to be >30% in the past 10 years due to the proliferation of the invasive <i>Procyon lotor</i> which both feeds on the species and its prey (predator and competitor). Additional population reductions are occurring due to habitat destruction for development and human activities along the Black Sea coast. Reductions are predicted to increase and the species needs to be monitored in future.

Species	Category	Criteria	Rationale
<i>Montivipera raddei</i>	NT		Listed as Near Threatened because it has experienced significant and continuing declines as a result of habitat loss and overexploitation, but less than 30% over the past three generations (18 years). Turkey: VU (A2d): Listed as Vulnerable in Turkey because it the population has declined at >30% over the past three generations (18 years). These declines are caused by exploitation for the pet trade.
<i>Montivipera wagneri</i>	CR	A2a+4c	Listed as Critically Endangered based on a population decline of more than 80% over the past 3 generations (18 years) due to exploitation and collection for the international pet trade. Planned dam construction would cause the loss of over 80% of the known habitat for this restricted range species.
<i>Pelia barani</i>	NT		Listed as Near Threatened because this species is in significant decline (but at a rate of less than 30% over ten years) because of over-harvesting for the international pet trade, making the species close to qualifying for Vulnerable. Development of its habitat and persecution are also major threats. Monitoring and protection efforts are necessary to prevent this species from becoming threatened.
<i>Pelias darevskii</i>	CR	B1ab(ii,iii)+ 2ab(ii,iii)	Listed as Critically Endangered because its Area of Occupancy is probably less than 10 km ² , its distribution is severely fragmented, and the extent of its habitat is declining due to effects of overgrazing around rock scree habitat.
<i>Pelias dinniki</i>	VU	B1ab(iii,v)	Listed as Vulnerable because its Extent of Occurrence is less than 20,000 km ² , its distribution is severely fragmented, and there is continuing decline due to persecution, over-collecting and overgrazing of its habitat.
<i>Pelias ebneri</i>	VU	B2ab(iii)	Listed as Vulnerable because its Area of Occupancy is possibly less than 2,000 km ² , its distribution is severely fragmented, and there is continuing decline in the extent and quality of its alpine meadow habitat.
<i>Pelias eriwanensis</i>	VU	B1ab(iii,v)	Listed as Vulnerable because its Extent of Occurrence is less than 20,000 km ² , its distribution is severely fragmented, and there is continuing decline in the extent and quality of its mountain steppe habitat due to overgrazing and agricultural conversion.
<i>Pelias kaznakovi</i>	EN	B2ab(ii,iii,v)	Listed as Endangered because its Area of Occupancy (confined to appropriate habitat within the range) is less than 500 km ² , its distribution is severely fragmented, and there is continuing decline due to over-collecting for the pet trade and in the extent and quality of its habitat. In addition, future development projects (tourism, urban development and dams) will likely cause further declines so the species should be monitored. It is thus likely that a 50% decline will occur in the next 10 years if estimated rates of decline continue.
<i>Pelias lotievi</i>	NT		Listed as Near Threatened because its Extent of Occurrence is probably not much greater than 20,000 km ² , and the extent and quality of its habitat are probably declining, thus making the species close to qualifying for Vulnerable.
<i>Pelias magnifica</i>	EN	B1ab(ii,iii,v); C2a(i)	Listed as Endangered because its Extent of Occurrence is less than 5,000 km ² , all individuals are in fewer than 5 locations, and there is continuing decline in the extent of occurrence, habitat quality and number of mature individuals. In addition there are less than 2,500 mature individuals in the population, with each subpopulation containing less than 250 individuals.

Species	Category	Criteria	Rationale
<i>Pelias orlovi</i>	CR	B1ab(i,v); C2a(i)	Listed as Critically Endangered because its Extent of Occurrence is less than 100 km ² , its distribution is severely fragmented, and there is continuing decline in the extent of occurrence and number of mature individuals due to over-collecting for the pet trade. In addition it is estimated that less than 250 mature individuals remain with little connectivity between subpopulations (each with less than 50 individuals).
<i>Pelias pontica</i>	CR	B1ab(i,iii,v); C1	Listed as Critically Endangered because its Extent of Occurrence is less than 100 km ² , its distribution is severely fragmented, and there is continuing decline in the extent of occurrence and number of mature individuals due to over-collecting for the pet trade. In addition it is estimated that less than 250 mature individuals remain with little connectivity between subpopulations (each with less than 50 individuals). There is a strong need for designation of protected areas as the species will likely become extinct in the near future.
<i>Pelias renardi</i>	VU	A1c+2c	This species is listed as Vulnerable because it has experienced habitat loss of over 30% over the past 3 generations (18 years). Habitat loss and fragmentation is continuing throughout its range.
<i>Vipera transcaucasiana</i>	NT		Listed as Near Threatened because this species is probably in significant decline (but at a rate of less than 30% over ten years) because of over-collecting for the pet trade and destruction of rocky habitats, thus making the species close to qualifying for Vulnerable.
<i>Phrynocephalus hortvathi</i>	CR	A2c	This species is listed as Critically Endangered because of a loss of more than 80% of its habitat over the past 3 generations (12 years) due to land conversion for agriculture and urbanization. In addition, its range is highly fragmented and the population is small and declining.
<i>Phrynocephalus persicus</i>	VU	A2c	Listed as Vulnerable because it has experienced a more than 30% habitat decline over the past 10 years. With low population densities, this habitat loss has led to significant fragmentation.
<i>Darevskia alpina</i>	VU	B1ab(i,iii,v)	Listed as Vulnerable because its Extent of Occurrence is less than 20,000 km ² , it is known from fewer than 10 locations, and there is continuing decline in the quality of habitat due to land conversion and climate change and the number of mature individuals is declining.
<i>Darevskia bendimahiensis</i>	EN	B1ab(ii)	Listed as Endangered because its Extent of Occurrence is less than 5,000 km ² , all individuals are in fewer than 5 locations, and there is a continuing decline in the extent and quality of its habitat.
<i>Darevskia clarcorum</i>	EN	B1ab(i,iii)	Listed as Endangered because its Extent of Occurrence is less than 5,000 km ² , all individuals are in fewer than 5 locations, and there is continuing decline in the extent and quality of habitat due to overgrazing.
<i>Darevskia dahli</i>	NT		Listed as Near Threatened because, although it is relatively abundant within its small range, its Extent of Occurrence is less than 5,000 km ² , and the extent and quality of its habitat are probably declining, thus making the species close to qualifying for Vulnerable. Competition with sympatric species is resulting in depressed populations for this parthenogenic species.
<i>Darevskia derjugini</i>	NT		Listed as Near Threatened because it is probably in significant decline (but at a rate of less than 30% over 10 years) because of widespread habitat loss and fragmentation of remaining populations through much of its range, thus making the species close to qualifying for Vulnerable.

Species	Category	Criteria	Rationale
<i>Darevskia dryada</i>	CR	B2ab(iii,v)	Listed as Critically Endangered because its Area of Occupancy is probably less than 10 km ² , all individuals are in a single sub-population, and the extent of its forest habitat has been severely reduced and continues to decline.
<i>Darevskia mixta</i>	NT		Listed as Near Threatened because although the species appears not to be in decline fast enough to qualify for a threatened category, its Extent of Occurrence is less than 5,000 km ² , thus making the species close to qualifying for Vulnerable.
<i>Darevskia praticola</i>	NT		Listed as Near Threatened because it is probably in significant decline (but at a rate of less than 30% over ten years) because of widespread habitat loss through much of its range, most especially in western populations, thus making the species close to qualifying for Vulnerable.
<i>Darevskia rostombekovi</i>	EN	B1ab(i,iii)	Listed as Endangered because its Extent of Occurrence is less than 5,000 km ² , all individuals are in fewer than 5 locations, and there is continuing decline in the extent and quality of its habitat.
<i>Darevskia uzzelli</i>	CR	B1ab(iii)+ 2ab(iii)	Listed as Critically Endangered because the Extent of Occurrence is less than 100 km ² , and its Area of Occupancy is less than 10 km ² , all individuals are in a single location, and there is continuing decline in the extent and quality of its habitat due to overgrazing and wood collection.
<i>Eremias pleskei</i>	CR	A2c	Listed as Critically Endangered because of a drastic population decline, estimated to be more than 80% over the last 10 years due to the loss of its very restricted habitat, an observed decline in distribution due to habitat loss (sandy enclaves) and anecdotal information on remaining populations.
<i>Iranolacerta brandti</i>	DD		There is a lack of information regarding threats to this species as well as its biology, ecology and geography. More research is therefore needed before a more accurate assessment can be made.
<i>Trachylepis septemtaeniatus</i>	DD		Listed as Data Deficient in view of continuing uncertainty as to its extent of occurrence in relation to <i>T. auratus</i> . This species complex needs to be fully reviewed, before the distributional ranges can be determined.

We have some comments on individual species. For example *Darevskia praticola* is recorded as NT, as a species with at least a 30% population decline and continuing habitat destruction (especially in western populations) so a possible change of category to VU could be considered. In the Caucasus it is not only widespread, but a species with a progressively increasing distribution and population. It is one of a few synanthropic species able to live in big cities (Krasnodar, Novorossiysk, Tuapse, and Sochi). We believe that the status of this species is unreasonably overrated and that it should be considered as Least Concern (LC).

An opposite example is presented by *Triturus karelinii*, considered globally Least Concern. In fact this species is the rarest among all Caucasian newts. Its range and number continue to decrease; it is also very rare in Crimea and there are now few localities from Iran. Therefore the category of this species should be no lower than NT. Lastly, a number of species considered Least Concern (LC) at global level are rare in the Caucasus or decreasing in number, as is reflected in regional Red Data books.

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Executive Summary

The project developed conservation recommendations for two endemic, threatened species of vipers (*Pelias [Vipera] kaznakovi*, *Pelias [Vipera] dinniki*) in the Caucasus. The critical condition of micro-populations of *Pelias kaznakovi* was noted in all sites investigated. The situation of *Pelias dinniki* was markedly more favorable. However, negative influences on both species were also marked, both natural-historical conditions and human activity. The main success of project was the inclusion of *Pelias dinniki*, on our recommendation, in the Red Data book of Krasnodarsky Krai/Region (where 2/3 of its population is concentrated). Also, for the first time, in the zoning of Sochi National Park, all places of occurrence of *Pelias kaznakovi* and *P. dinniki* were included in the specially protected areas.

Scope of the Work

The ancient polymorphic group of shield-headed vipers of «kaznakovi»-complex included 4 species until recently: *Pelias kaznakovi* (Nikolskiy, 1909), *P. dinniki* (Nikolskiy, 1913), *P. darevskii* (Vedmederja et al. 1986) and *P. pontica* (Billing et al. 1990). In 2001, two new species of *Pelias* were described: *P. orlovi* (Tuniyev and Ostrovskikh, 2001) and *P. magnifica* (Tuniyev and Ostrovskikh, 2001). Presumably *Pelias bārani* (Böhme et Joger, 1984) also belongs to this complex.

The aim of the project was to develop recommendations on conserving two endemic, threatened species of vipers (*Pelias kaznakovi*, *P. dinniki*) in the Caucasus, with a focus on the West Caucasian Biosphere Region. This was done on the basis of a rapid assessment of their current distribution and status, consultative discussions on the status of the species in key areas and on a transboundary conservation program.

Material was collected in alpine areas of the Greater Caucasus, particularly in Krasnodarsky Krai, Adygea (NW), Karachay-Cherkessia (NW), Kabardino-Balkaria (NW), Alania-North Ossetia (central part on N slope) and Daghestan (NE); in Abkhazia (SW), as well as in north-eastern Turkey (Mostly W Lesser Caucasus); also along the Black Sea coast in Russia, Georgia and Turkey. Earlier material collected in Chechnya, Ingushetia, Daghestan (NE Greater Caucasus), in Kura River catchment basin (Lagodekhi, SE Greater Caucasus and Borjomi, N Lesser Caucasus), Adjara (Batumi, Charnali, Gonio, Sarpi, W Lesser Caucasus), Poti (Kolkheti Lowlands) was also utilized, as well as material in collections (Zoological Institute Academy of Science of Russia, Zoological Museum of Moscow State University), and material kindly sent from Daghestan by E.S. Roitberg, and verbal reports from the late M.A. Bakradze on Lagodekhi.

Pelias dinniki (Nik., 1913) - Dinnik's viper

Status. Dinnik's viper (Fig. 1) is a declining species with some populations near to extinction. It is listed as Vulnerable (VU) in the IUCN Red List (Tuniyev et al. 2008a) and in the Red Data books of the Russian Federation (2001), Krasnodarsky Krai (2007), and Adygea Republic (2000).

Distribution and Habitats. Dinnik's viper is a subalpine species, occurring from the middle- to upper-alpine belts, up to 2200-2600 m asl. In Krasnodar Territory and Adigea Republic it was found along all middle-mountain and high-mountain zones of Kavkazsky State Biosphere Reserve, Sochi National Park and Sochi Federal Sanctuary. It inhabits pine forests, glades, subalpine and alpine meadows, overgrown talus slopes, and subalpine elfin-woods.

In Krasnodarsky Krai and Adygea Republic, Dinnik's viper was found in 68 localities. In the Karachay-



Fig. 1. *Pelias dinniki* - Dinnik's viper / © B. Tuniyev

Cherkessia republic it occurs in subalpine birch woods, pine forests, moraines, stony meadows and glades of the Imeretinka River, Mt. Zakan, Mt. Bolshaya Khatipara, Azgek canyon, Mukhu River, Abishir-Akhuba Ridge, and headwaters of the Kuban River. Unlike more brightly-colored populations from the Caucasus Reserve, Dinnik's viper from Teberdinsky Reserve is not so variable in color (grey and brown tones prevail), but they are still quite variable on the head and zigzag of the back.

From Kabardino-Balkaria and farther to the east, there are already isolated populations, which we investigated on Elbrus, in the

headwaters of the Fiagdon River (Alania-North Ossetia), Itumkalinskay Hollow of Chanty-Argun River (Chechnya), and Mt. Guton (Daghestan). The color of animals in these eastern populations is the most subdued of all: gray tones with darker zigzag, although some individuals can show a contrasting picture due to yellow edging of the zigzag.

headwaters of the Fiagdon River (Alania-North Ossetia), Itumkalinskay Hollow of Chanty-Argun River (Chechnya), and Mt. Guton (Daghestan). The color of animals in these eastern populations is the most subdued of all: gray tones with darker zigzag, although some individuals can show a contrasting picture due to yellow edging of the zigzag.

The species is noted along practically all the highlands of western Georgia, the limestone mountains of Arabika, eastward to Svaneti and with an isolated population from Lagodekhi in eastern Georgia. Animals from Georgia are less brightly-colored than in Krasnodarsky Krai and Adygea Republic. They have brown-yellowish tones with a brown zigzag.

Population. Density varies, but numbers are declining practically everywhere. According to the Red Data book of the USSR (1984) there are 2-6/ha in the subalpine belt of the Greater Caucasus. In some places there are seasonal concentrations up to 30-40/ha. At present, the species reaches its highest density on stony talus slopes of the subalpine belt in the Caucasus Reserve. In the westernmost part of the area, in Sochi National Park (Khakudzh and Bekeshey mountains), Dinnik's viper is extremely rare and is more common on Mt. Achishkho and the Aibga Ridge. High concentrations are noted on Aishkha Ridge within Sochi Federal Sanctuary, where up to 46 vipers were counted during a daily excursion.

In Teberdinsky Reserve the species is common, in some places abundant; the highest density was observed on Mt. Bolshaya Khatipara (up to 30/ha). In Abkhazia density on the moraines of Kamenny Klad Ridge reaches 20/ha. In eastern Georgia, Kabardino-Balkaria, Alania-North Ossetia, Chechnya and Daghestan the species is extremely rare, and sporadically distributed in most mesic parts of the subalpine belt. It reaches a maximum density of 3/ha. Confirmed records from Ingushetia and Azerbaijan are not available at present, but the occurrence of Dinnik's viper in these districts is highly likely.

Ecology. In the high-mountain zones of the Greater Caucasus, heavy precipitation occurs and snow cover

remains for over half the year. A limited number of snake species can survive in such difficult conditions. *Pelias dinniki* is one of the obligate oreophylous species of the snake fauna of the Greater Caucasus.

Based on more than 30 years of observations both in the wild and in terrariums, young *Pelias dinniki* are born at the end of August - beginning of September. Later births are recorded in captivity: in the last ten days of September to the first ten days of November. In high-mountain zones, the first snow falls in mid-September and there is full snow cover from mid-October. Female vipers cannot give birth in this period and must hibernate while pregnant. New-born *P. dinniki* have been seen in the wild at the end of June - beginning of July. The ability of females to hibernate while pregnant is not a general characteristic but depends on locality, though this reproductive strategy is observed regularly.

Another interesting feature is the ability to give birth a year after mating, as observed by us in terrariums. The possible reproduction without males in high-mountain zones of the Greater Caucasus can reflect either parthenogenesis, or the protracted retention of viable sperm, or delayed development of the impregnated ovules. Without special histological analysis it is impossible to resolve this question. Remaining pregnant during hibernation and the possibility of giving birth without mating are unique aspects of the reproductive strategies of alpine snakes of the Caucasus, developed in the glacial period.

Threats. Outside protected areas, basic threats to western populations are recreational development and direct elimination of snakes and for eastern populations – grazing and direct elimination. In existing protected areas the basic threat is direct elimination and capture.

Protected Areas. NW Greater Caucasus: Sochi National Park – not less than 5,000 individuals (population is stable in the east and close to disappearance in the west of the Park); Kavkazsky State Biosphere Reserve – not less than 100,000 (stable); Sochi Federal Sanctuary – not less than 5,000 (stable); Teberdinsky State Biosphere Reserve – not less than 30,000 (stable); «Priel'brus'e» National Park (NW Greater Caucasus), Kabardino-Balkarsky High-Mountain Reserve (NW Greater Caucasus), Lagodekhi Reserve (SE Greater Caucasus), Tlyaratinsky Federal Sanctuary (NE Greater Caucasus) – numerous but size of populations has not been determined. In Ritsa (SW Greater Caucasus) – no more than 1,000. The North-Ossetia Reserve (N slope of Central Greater Caucasus) has no more than 1,000. On the whole, numbers and population trend in protected areas are tending to decline.



Fig. 2. *Pelias kaznakovi* - Caucasian viper / © B. Tuniyev

Conservation Recommendations. The species is relatively safe in existing protected areas, but requires additional protection measures. In the Russian Federation it is necessary to create a new Federal Reserve in Itum-Kalinskaya Hollow of Chanty-Argun River in the Chechen Republic; to include within the Caucasus Reserve or Sochi National Park the south slope of Aishkha Ridge, from Sodovy Brook to the current border of the reserve. In Daghestan it is necessary to protect Guton Mountain and to create a State Reserve on the basis of Tlyaratinsky Sanctuary. International effort is needed to develop transboundary initiatives between appropriately located protected areas (Krokhmal and Tuniyev 2003).

***Pelias [Vipera] kaznakovi* (Nikolsky, 1909) - Caucasian viper**

Status. Caucasian viper (Fig. 2 and 3) is progressively disappearing across its range. Listed as Endangered (EN) in the IUCN Red List (Tuniyev et al. 2008b), Red Data books of Russian Federation (2001), Georgia (1982), Krasnodarsky Krai (2007), Adygea Republic (1999).

Distribution and Habitats. In Krasnodarsky Krai and Adygea Republic animals were found in 31 localities. It is present sporadically in Abkhazia (the vicinity of Gantiadi, Gagry, Bzyb Canyon, Pitsunda-Myusera Reserve, Bolshie Bebesyry Lake) and occurs in coastal Adjara (Poti, Batumi, Charnali Gorge). In Turkey it is found in the vicinity of Hopa – Kamili – Arkhavi.



Fig. 3 *Pelias kaznakovi* - Caucasian viper (melanistic specimen) / © B. Tuniyev

Population. In places where it was common at the beginning of the 20th century, it has now either disappeared or only non-viable micro-populations remain. Population density varies. In the vicinity of Tuapse, up to 3/100 m² were counted (Ostrovskikh 1991). On the Black Sea coast single specimens might be observed. The densest populations are found in Veselovsky and Aibginsky Forestry of Sochi National Park, where in a daily excursion it is possible to encounter 10 individuals. The total number in the Russian Federation does not exceed 2,000. The total number in Georgia scarcely exceeds 3,000. Numbers have not been estimated in the Turkish part of the range.

Threats. Basic threats are elimination of vipers, intensive capture by amateur herpetologists, transformation of their habitats, and recreational development of the Black Sea coast.

Protected Areas. NW Greater Caucasus: this species occurs in Kavkazsky State Biosphere Reserve, (threatened population, no more than 300 in total), Sochi National Park, (the core population in the Russian Federation with about 1,000 individuals); SW Greater Caucasus: Ritsa (threatened population, no more than 200 specimens in total) and Pitsunda-Myusera Reserve (coastal area; threatened population, no more than 100 specimens); W Lesser Caucasus: Kintrishi Reserve, (threatened population, number unknown), Turkish part: Camili Biosphere Reserve (threatened population, number unknown; Afsar & Afsar in press). Confirmation is needed of current occurrence in state parks of Altındere, Karagel-Sahara, Hatila-Vadisi (W Lesser Caucasus, Turkey); Borjomi reserve (Bakradze 1969) and Borjomi-Kharagauli National Park (N Lesser Caucasus); Pskhu-Gumista and Kobuleti Reserves, Sataplia, Kolkheti and Mtirala National Parks (Colchic bio-geographic region, eastern part of the Black Sea catchment basin). On the whole, in most of its natural habitat, density of the species is substantially below natural density. Strengthening protection in existing protected areas is needed as well as educational work among employees and visitors to protected areas.

Conservation Recommendations. All areas with high density of Caucasian vipers in Sochi National Park are already in the specially protected area. Work has begun on including Loosky Forestry within

Sochi National Park. To conserve *P. kaznakovi* it is necessary to create reserves: Gagry - from Psou River and Sal'me on the north-west to the lower course of Bzyb River on the southeast, including the narrow canyons on the south slope of Gagrinsky Ridge (Tuniyev and Nilson 1995); to increase the area of Pskhu-Gumista Reserve, selecting cluster areas near Tsebel'da and Amtkel Lake; to increase the area of Kintrishi Reserve, in accordance with the recommendations of Memiadze (1976); to protect all forest parts of Kintrishi, Dekhvan, Chakhvistkali and Korolistkali gorges above 300-500 m and additionally to preserve 5 small areas in inland Adjara in the Adzharistskhali basin; to create the Reserve, including Charnali Gorge and Shavsheti Ridge.

International cooperation is needed to conserve this species, by designation of a «Colchic» Transboundary Biosphere Polygon/Territory, which could include all existing and planned protected areas within the eastern part of the Black Sea catchment basin.

Conclusions

Inclusion of *P. kaznakovi* and *P. dinniki* in the Red Data book of the Krasnodarsky Krai (2007) should be considered. Earlier, both species were included in the Red Data book of Russian Federation (2001) and Red Data book of Adygea Republic (2000). Thus, both species received legal and territorial protection at State and Regional level, at least, in the basic area covered by this project - West Caucasian Biosphere Region. A positive development is the start of a process to include Loosky Forestry within Sochi National Park to unite two cluster areas in a single protected area.

There are three forms of existing protection: legal, captive breeding, and territorial. Legal protection includes numerous acts, regulating or fully forbidding the killing or capture of one or another species. It should be underlined that *P. dinniki* was included in the Red Data books of different levels only in the new millennium, and the listing of *P. kaznakovi* in practically all international, national, and regional red lists and books over a long period has had little effect on reducing loss of natural habitat or population declines.

Captive breeding facilities to build up populations for subsequent reintroduction are practically absent for *P. kaznakovi* and *P. dinniki*, although some experience in terrariums has been accumulated. The most effective and reliable form of protection is territorial: nature reserves and other types of protected area. Nature monuments, as well as reservations, remain tourist destinations and are deprived of real protection, at least as applied to amphibians and reptiles. In national parks, with rare exceptions, scientifically-based zoning that takes into account the need to conserve vipers is absent.

The only existing reserve covering a large area is the Caucasus Reserve, but more than 66% of its territory is located on the north slope of the Greater Caucasus, and the southern part is occupied by middle-mountain and alpine landscapes, so that *P. kaznakovi* practically receives no protection. Reserves in Georgia and Turkey are extremely small in area, and the range of *P. kaznakovi* on their territory is extremely limited. To save both species of vipers, we consider a primary and urgent task to be improving the network of protected areas.

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Executive Summary

Data on current and historical status of sturgeons in Georgia were obtained by the project 'Research on Sturgeon Conservation Status in Georgia' implemented in 2006-2008. The study and monitoring of sturgeons in Georgia were suspended in 1991 due to political developments and resumed 16 years later within the framework of this project. The project covered: species composition, population size and structure, distribution, habitat status and harvesting, analysis of the decline, and threats. Sturgeon conservation status was determined and a guideline national conservation action plan was developed based on the project results.

According to our estimates, by 2007 the total number of sturgeons in Georgia declined to its historical minimum of 10,000, meaning that from 1907 to the present, the number of sturgeons has declined at least 37 times.

Status

All six species native to Georgia were found during the study so sturgeon species composition in the Georgian part of the Black Sea and the rivers falling into it maintains its historical diversity.

1. European sturgeon *Acipenser sturio* (Linnaeus, 1758) (Georgian: poronji, poreji);
2. Starry sturgeon *Acipenser stellatus* (Pallas, 1771) (Georgian: t'araghana, tskvrini);
3. Fringebarbel sturgeon *Acipenser nudiventris* (Lovetzky, 1828) (Georgian: jarghala);
4. Colchic sturgeon *Acipenser persicus colchicus* (Marti, 1940) (Georgian: zutkhi, tarti, dokhok'oni);
5. Danube-azov sturgeon *Acipenser güldenstädti tanaica* (Marti, 1940) (Georgian: zutkhi); and
6. Beluga sturgeon *Huso huso* (Linnaeus, 1758) (Georgian: svia).

A total of 281 individuals were examined during the study:

A. sturio: since 1991 there have been only three confirmed records. One was caught in 1999 near the mouth of the Rioni. One was seen at Batumi fish market on 20 August 2004. In November 2007, six juveniles were caught in the Black Sea, near the Rioni mouth. Four were released into the sea alive, while two were examined and identified as *A. sturio*.

A. nudiventris: 2 were caught.

A. güldenstädti tanaica: 7 were caught; apparently only a few of this species occur in Georgia.

A. stellatus: 37 individuals; minimum length – 20.05 cm, maximum length – 119 cm (weight – 9 kg). Individuals 30-70 cm long make up 78.33% of the population. Average length is 53.91 cm. Spawners make up 5.40% of the population.

H. huso: 87 individuals; minimum length – 22 cm, maximum length – 211 and 236 cm (weight – 62 and 88 kg); individuals 40-70 cm long make up 49.91% of the population. Average length is 74.71 cm. Spawners make up 6.09% of the population; females make up 40%, and males 60% of spawners.

A. persicus colchicus: 151 individuals; minimum length – 18 cm, maximum length – 151 cm and 158