

A review of distribution and conservation status of *Zamenis situla* (Linnaeus, 1758) (Reptilia: Colubridae) in Bulgaria

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Abstract. The leopard snake is one of the rarest snake species in Bulgaria. It is included in the Red Data Book of Bulgaria as threatened species under high anthropogenic pressure. Its distribution range in Bulgaria includes only three very distant regions in the southern part of the country. Precise literature data about the leopard snake in Bulgaria are scarce. The aim of this paper is to present distribution data as well as to review the conservation status of the leopard snake in Bulgaria.

Keywords. Leopard snake, distribution, conservation, Bulgaria, Balkan peninsula.

DISTRIBUTION OF THE LEOPARD SNAKE IN BULGARIA

The leopard snake, *Zamenis situla* (Linnaeus, 1758) is distributed mainly in the Balkan Peninsula (Dalmatian coastal region, southern Bosnia and Montenegro, Macedonia, Albania, southern Bulgaria, European Turkey and Greece); outside the Balkans, this species occurs in southern Italy, Malta, Crete, Ionian and Aegean islands, western Anatolia and in the Crimean Peninsula (Obst et al., 1993; Sofianidou, 1997).

Distribution of the leopard snake in Bulgaria includes only three very distant regions in the southern part of the country (Fig. 1). It was recorded for the first time in 1898 (Buresch and Zonkow, 1934). Since then, only eleven localities were published.

In the Black Sea coastal region, five localities were published by Kovachev (1912), Buresch and Zonkow (1934), Obst (1981), Buseke (1982), Beyer (2000), Moravec and Böhme (2003) and Naumov (2005) (UTM records no. 1-2; Fig. 1). The last time when *Z. situla* was recorded in the Black Sea region was in 2000 (Beyer, 2000), at the Elenite locality (UTM record no. 1). At the same time, this locality is the northernmost in the whole distribution range in Bulgaria, but it is still uncertain whether this locality hosts an autochthonous population or not. The locality Nesebar (UTM record no. 1, Fig. 1) is question-

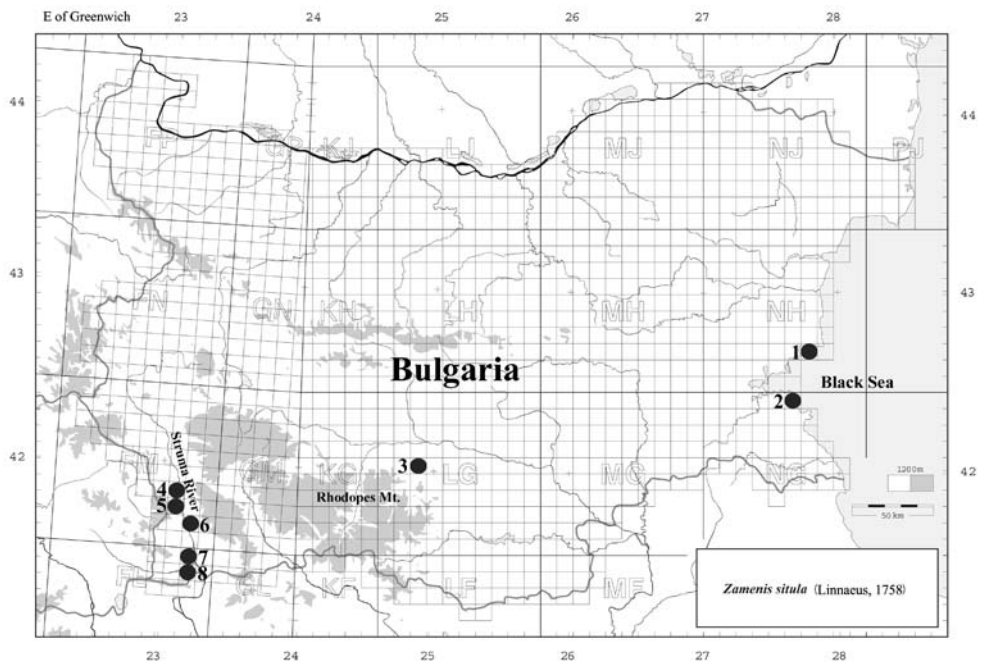


Fig. 1. Records of *Zamenis situla* in Bulgaria (National Grid UTM 10x10 km Reference).

able because the specimen was found inside the town and as Naumov (2005) supposes it was probably brought from a different region and escaped from the city.

In the Rhodopes Mountains region, only one specimen was found in Asenovgrad (Kovachev, 1912) (UTM record no. 3; Fig. 1). Unfortunately, this record was never confirmed after the first finding, and according to Beshkov and Nanev (2002) this population probably does not exist.

In the Struma River valley, five localities were recorded by Beshkov (1961, 1985), Beshkov and Dushkov (1981), Biserkov (1995) and Beshkov and Nanev (2002) (UTM records no. 5-8, Fig. 1). During the last 15 years, the leopard snake was found in a few additional sites in the Kresna George (Struma River valley) (UTM records no. 4-5, Fig. 1): Gabrovitsa Place (220 m a.s.l.), 0.5 km SE of the mouth of Oshtava River (220 m a.s.l.), 1 km W of Stara Kresna railway station (450 m a.s.l.), 0.5 km NW of the mouth of Rachkin Dol River (300 m a.s.l.), and along the railway in the section between Kresna Inn and Vlahi River (200-230 m a.s.l.).

Published records cover only 0.64 % of the UTM-territory of Bulgaria. This species inhabits dry, warm, rocky places characterized by well developed micro relief and covered with Mediterranean vegetation up to 650 m a.s.l. (Beshkov and Nanev, 2002).

Potential suitable habitats of the leopard snake could be found in the wider area of Struma River valley including the lower parts of the Maleshevska, Ograzden, Belasica and Pirin Mountains, as well. New finding sites in the Black Sea coastal regions (south of Burgas in the southern part) and in the East Rhodopes Mt. bordering region (in the

easternmost part of the Arda River valley) could also be discovered with more detailed survey.

CONSERVATION STATUS OF THE LEOPARD SNAKE IN BULGARIA

The leopard snake is considered rare or declining in several parts of its distribution range; the populations are localized and declining in Crimea, Italy and Dalmatia (Sofianidou, 1997), while its conservation status is still needed for populations in Bosnia, Montenegro, Macedonia and Albania. This species is included in the Annex II/IV of the EU Habitats directive, Annex II of the Bern Convention and treated as DD in the IUCN Red List of the Threatened Animals (Gasc et al., 1997). In Bulgaria, this species is considered as threatened (Beshkov, 1985) and thus is included in the Red Data Book and protected by Biodiversity protection act of Bulgaria (Annex II/III), since August, 2002. Populations are mainly threatened by illegal over-collecting by the amateurs as well as destruction of the habitats.

It seems that the populations from the Black Sea coastal region are upon the highest over collection pressure. The Sozopol locality (UTM record no. 2) is the most endangered, having in mind that 85 specimens deposited at the museums of Bonn and Prague “were apparently collected at the same locality just after hibernation in 1981-1983” according to Moravec and Böhme (2003).

In the Struma River valley region, the populations from the southern part of the Kresna George (UTM records no. 4-5) seem to be the most stable, giving the fact that population density is rather high. According to authors’ observations from the last fifteen years in the area, 2-3 specimens can be found per 5-6 km transect along the railway (locality no. 5). Unfortunately, the habitats, as well as the populations of amphibians and reptiles in this area, will certainly be under constant threat by the construction of the highway in this region.

Another conservation problem could be related to reproduction and population growth: average clutch size in Bulgarian populations is 2 to 4 eggs (rarely to 5) (Beshkov and Nanev, 2002) and hence this species has the lowest fecundity of all snake species in Bulgaria.

Suggested conservation measures would have to include the habitats of *Z. situla* into the Natura2000 network; strict implementation of the national and international legislative (especially about illegal harvesting) is needed. Building of reptile crossing sites could improve conservation of this and all other reptile species, particularly at the main road that passes through the Kresna Gorge area. Merging of habitats of *Z. situla* with existing nature reserve Tisata up to the north to Kresna Inn, could give positive result on population status of this species in the whole region. Population studies and detailed distribution data in the southern parts of Black sea coastal area are needed for estimation of actual population status of *Z. situla* in Sozopol area.

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