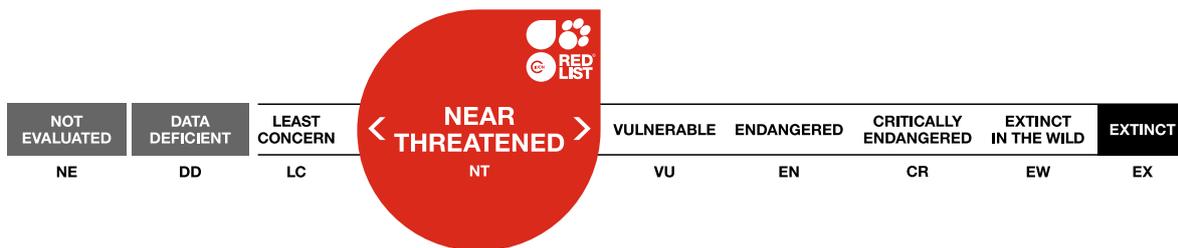


Dinarolacerta mosorensis, Mosor Rock Lizard

Assessment by: Crnobrnja-Isailović, J., Bowles, P. & Jelić, D.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Reptilia	Squamata	Lacertidae

Scientific Name: *Dinarolacerta mosorensis* (Kolombatović, 1886)

Synonym(s):

- *Lacerta mosorensis* Kolombatović, 1886

Common Name(s):

- English: Mosor Rock Lizard
- Bosnian: Mosorski gušter
- Croatian: Mosorska gušterica
- German: Mosor-gebirgseidechse

Taxonomic Source(s):

Uetz, P., Freed, P. and Hošek, J. (eds). 2021. The Reptile Database. Available at: <http://www.reptile-database.org>. (Accessed: 3 April 2021).

Taxonomic Notes:

An isolated eastern subpopulation in Montenegro has been recognised as a separate species, *Dinarolacerta montenegrina* (Ljubisavljević *et al.* 2007).

Assessment Information

Red List Category & Criteria: Near Threatened B1ab(iii) [ver 3.1](#)

Year Published: 2024

Date Assessed: October 12, 2022

Justification:

Global and European regional assessment: Near Threatened (NT)

EU 27 regional assessment: Endangered (EN)

This European endemic species is assessed as Near Threatened (NT B1ab(iii)) in Europe on the basis that the species has an extent of occurrence below 16,000 km² and a continuing decline in the quality of its habitat in at least part of the range, however it is unclear whether (and presently not thought to be the case that) the species occurs as a severely fragmented population or whether habitat decline is extensive enough to warrant recognising 10 or fewer locations.

Within the EU 27 the species is restricted to a limited area of Croatia, corresponding to approximately 10% of the global range (1,528 km²), with a maximum area of occupancy inferred from available habitat probably below 300 km², it is considered to occur at three locations defined by varied threats from human activity, and there is a continuing decline in the quality and extent of its habitat and by inference in the number of mature individuals. It is consequently assessed as Endangered B1ab(iii)+B2ab(iii).

Geographic Range

Range Description:

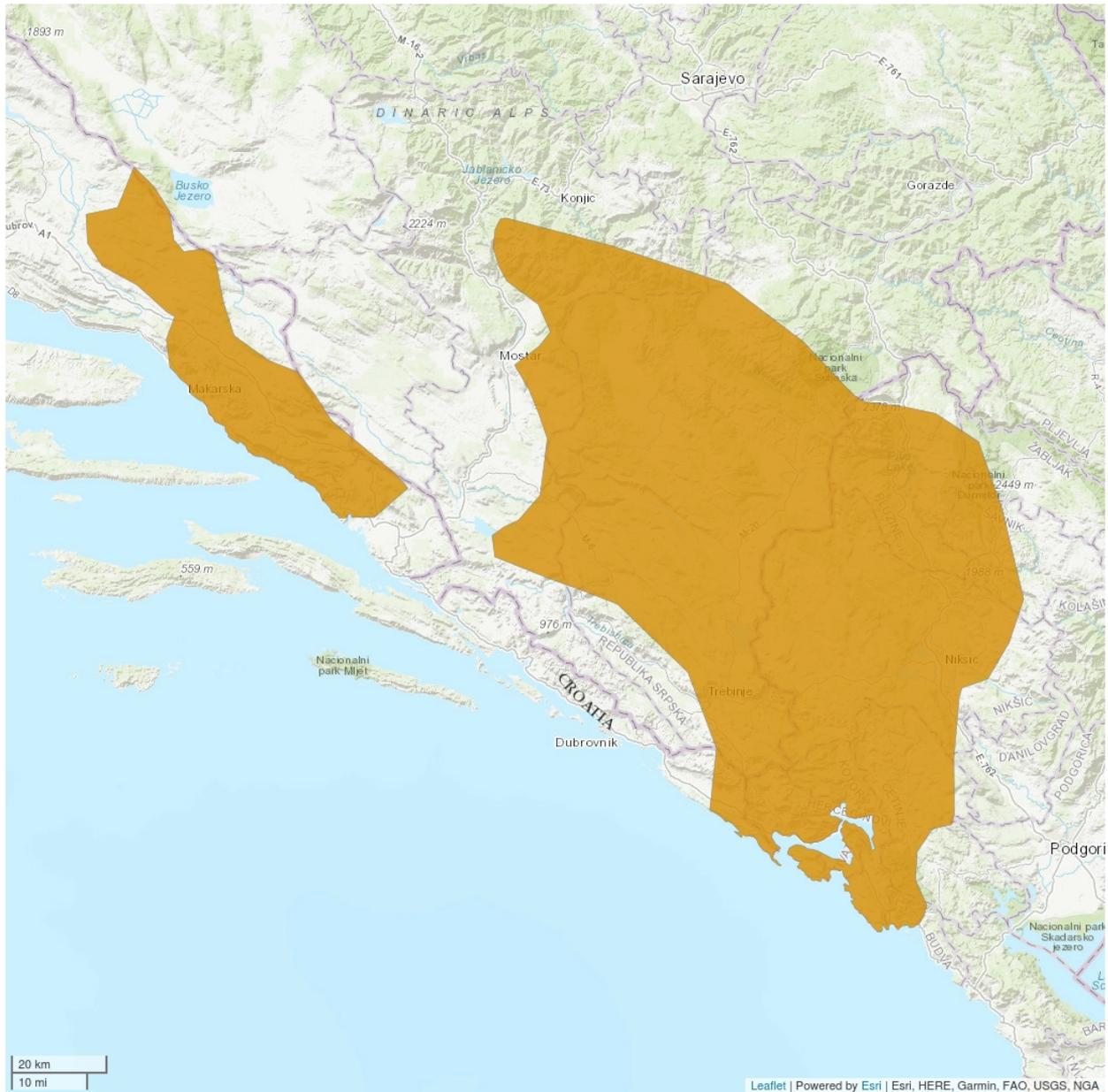
This species is endemic to Europe, where it is restricted to coastal mountains in a limited, isolated area of southeastern Croatia (Opor, Kozjak [together regarded as a single location - D. Jelić pers. comm. 2023], Mosor and Biokovo in central Dalmatia - Jelić *et al.* 2012), southern Bosnia and Herzegovina, and western and central Montenegro (Speybroeck *et al.* 2016, Ljubisavljević *et al.* 2016). It probably occurs more widely between known localities in Montenegro than is presently known (Ljubisavljević *et al.* 2016). Museum specimens were identified in 1989 from Sinj (Croatia) and Troglav (on the Croatia/Bosnia and Herzegovina border), but the species' occurrence in these areas has not been reconfirmed (Jelić *et al.* 2012).

It occurs from 450 to 1,900 m asl (with an exceptional record from 270 m in the Mrtvica River canyon which is likely to be relictual - Ljubisavljević *et al.* 2016). In Croatia it is known to be extant only at elevations above 1,000 m asl, although historical records are from as low as 600 m asl (Jelić *et al.* 2012).

Country Occurrence:

Native, Extant (resident): Bosnia and Herzegovina; Croatia; Montenegro

Distribution Map



Legend

EXTANT (RESIDENT)

Compiled by:

European Red List, EC and IUCN 2023



The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.



Population

It is not a common species and has a patchy distribution, and it appears to have a fragmented distribution, however, it is a cryptic species that is easily missed in surveys, and the subpopulations are not considered to be severely fragmented across the range as a whole. Subpopulations in Croatia are however small and isolated from one another, and the species is probably declining in this country (Jelić *et al.* 2012). The largest subpopulation in Croatia, corresponding to 60% of the known Croatian population, is presumed to be on Biokovo due to the size of this mountain and available habitat at elevations above 1,000 m (D. Jelić pers. comm. 2023). The range in Montenegro also appears to be fragmented (Ljubisavljević *et al.* 2018).

Current Population Trend: Decreasing

Habitat and Ecology (see Appendix for additional information)

This species is largely found in humid, rocky, montane areas of exposed karst. The species inhabits open woodland and sites with a rich vegetation cover. It is known from rocky pasture at high elevations (above the treeline) or created following deforestation, as well as thermophilous beech forest and Oro-Mediterranean whitebark pine (Ljubisavljević *et al.* 2016). It appears to be highly specialised to rocky habitats, typically at higher elevations, and may be a weak competitor as its occurrence is negatively correlated with that of all other lizards (D. Jelić pers. comm. 2023). In Croatia it seems to be restricted to areas too high and cold for rock-dwelling *Podarcis* species or the thermophilic *Dalmatolacerta oxycephala* (Jelić *et al.* in prep.). The unusual low-elevation subpopulation in the Mrtvica River canyon was found on rocks near the water in the humid valley bottom, with hornbeam forest on the slopes (Ljubisavljević *et al.* 2016). A comparison of the ecology of the two *Dinarolacerta* species found that the Prokletije rock lizard is associated with lower proportions of rock cover, fewer refuge sites, and consequently more vegetation or leaf litter, favouring more shaded, damp spots (Ljubisavljević *et al.* 2017). Referring to both *Dinarolacerta* species, Speybroeck *et al.* (2016) describe females laying 3-5 eggs shortly after emerging from hibernation, with a rapid incubation period (17-19 days) which may be an adaptation to short activity periods in high mountains (Speybroeck *et al.* 2016). Animals reach sexual maturity at 3-4 years, and maximum longevity of 10 years has been recorded (Jelić *et al.* 2012). Tomašević Kolarov *et al.* (2010) recorded median and modal ages of 5-6 years in their study subpopulation on Mt. Lovćen (Tomašević Kolarov *et al.* 2010). In Croatia (where the species is generally found in rocky, sparsely-vegetated areas at high elevations where snow is present for much of the year) mating is restricted to mid-May-mid-June and females lay a single clutch (Jelić *et al.* 2012).

Systems: Terrestrial

Use and Trade

This species is not subject to significant use or trade, although it was subject to some collection in the past and some degree of collection may be ongoing.

Threats (see Appendix for additional information)

In the Bosnian Federation this species is impacted by tourism, intense grazing in mountain areas, and by collection for pet trade (Lelo 2011). In Croatia it is exposed to illegal construction, establishment of illegal dumping sites, and construction of transportation infrastructure (Jelić *et al.* 2012). Additionally

there are plans for building large tourist resorts and establishing large wind farms in the areas inhabited by this species (Jelić *et al.* 2012), and tourist development in mountain areas has been rapid (J. Crnobrnja-Isailović pers. comm. October 2022). There is increasing pressure at lower elevations of Opor, Kozjak, and Mosor from urban housing development and road construction, and the resulting increase in human activity and settlement has led to more frequent wildfires (D. Jelić pers. comm. 2023). Wildlife on these mountains and Biokov (where the largest Croatian subpopulation occurs) has reduced habitat quality in large parts of the species' range (D. Jelić pers. comm. 2023). The combination of habitat alteration due to these varied causes and the impacts of climate change facilitates upslope range expansion by several lizard species, which is likely to represent a particular threat to this species as available evidence suggests it is restricted to areas where these competitors are absent (Jelić *et al.* in prep).

In Montenegro it is threatened by the loss of suitable habitat due to logging, including within protected areas. It has been found in low densities on Mt. Lovćen, an area with little leaf litter and low tree canopy which may inhibit predation and reduce reproductive success, with lower clutch sizes recorded at this locality than in the species' core range (Ljubisavljević *et al.* 2017). While this may reflect the peripheral nature of this subpopulation, at the southern limit of the species' range, Ljubisavljević *et al.* (2017) note that the natural beech forest at this locality was replaced by conifer plantations planted in the 1940s-50s and 1970s. These authors hypothesise that, although the species appears able to tolerate deforestation so long as suitable microhabitat structure remains, altered temperature and humidity regimes following the removal of natural forest may have long-term negative impacts. This may be exacerbated by climate impacts, as this species is reliant on specific moist habitats likely to be at elevated risk from climate change (J. Crnobrnja-Isailović pers. comm. October 2022). The collection of animals for the pet-trade was a threat in the past, and collecting for sale in pet shops is still listed as a threat in the national Red List of the Bosnian Federation (Lelo *et al.* 2016). It is likely that some small-scale illegal trade continues.

Conservation Actions (see Appendix for additional information)

It is listed in Annex III of the Bern Convention and is protected by national legislation in some range countries (e.g. Croatia and Montenegro). It is present in a number of protected areas. The species is assessed as Vulnerable in Croatia (Jelić *et al.* 2012), in the Bosnian Federation (Lelo *et al.* 2016), and in Montenegro (Gvozdinović and Iković 2022).

Surveys targeting this species should encompass potential refugial sites in river valleys and gorges as well as its typical montane habitat (Ljubisavljević *et al.* 2016). Ljubisavljević *et al.* (2017) propose monitoring of the Mt. Lovćen subpopulation and research into habitat selection elsewhere in the range that can inform appropriate conservation management (Ljubisavljević *et al.* 2017).

Credits

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Appendix

Habitats

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Habitat	Season	Suitability	Major Importance?
1. Forest -> 1.1. Forest - Boreal	Resident	Suitable	No
1. Forest -> 1.4. Forest - Temperate	Resident	Suitable	No
3. Shrubland -> 3.4. Shrubland - Temperate	Resident	Suitable	No
4. Grassland -> 4.4. Grassland - Temperate	Resident	Suitable	Yes
6. Rocky areas (eg. inland cliffs, mountain peaks)	-	-	-

Use and Trade

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

End Use	Local	National	International
13. Pets/display animals, horticulture	No	Yes	Yes

Threats

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Threat	Timing	Scope	Severity
1. Residential & commercial development -> 1.1. Housing & urban areas	Ongoing	Minority (<50%)	Unknown
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation	
2. Agriculture & aquaculture -> 2.2. Wood & pulp plantations -> 2.2.3. Scale Unknown/Unrecorded	Ongoing	Unknown	Unknown
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation	
4. Transportation & service corridors -> 4.1. Roads & railroads	Ongoing	Minority (<50%)	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation	
5. Biological resource use -> 5.3. Logging & wood harvesting -> 5.3.5. Motivation Unknown/Unrecorded	Ongoing	Unknown	Unknown
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation	
7. Natural system modifications -> 7.1. Fire & fire suppression -> 7.1.1. Increase in fire frequency/intensity	Ongoing	Minority (<50%)	Unknown
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation	

8. Invasive and other problematic species, genes & diseases -> 8.2. Problematic native species/diseases -> 8.2.2. Named species (Podarcis melisellensis)	Ongoing	Unknown	Unknown
	Stresses:	2. Species Stresses -> 2.3. Indirect species effects -> 2.3.2. Competition	
8. Invasive and other problematic species, genes & diseases -> 8.2. Problematic native species/diseases -> 8.2.2. Named species (Podarcis muralis)	Ongoing	Unknown	Unknown
	Stresses:	2. Species Stresses -> 2.3. Indirect species effects -> 2.3.2. Competition	
8. Invasive and other problematic species, genes & diseases -> 8.2. Problematic native species/diseases -> 8.2.2. Named species (Podarcis siculus)	Ongoing	Unknown	Unknown
	Stresses:	2. Species Stresses -> 2.3. Indirect species effects -> 2.3.2. Competition	
8. Invasive and other problematic species, genes & diseases -> 8.2. Problematic native species/diseases -> 8.2.2. Named species (Dalmatolacerta oxycephala)	Ongoing	Unknown	Unknown
	Stresses:	2. Species Stresses -> 2.3. Indirect species effects -> 2.3.2. Competition	

Conservation Actions in Place

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Conservation Action in Place
In-place land/water protection
Occurs in at least one protected area: Yes

Conservation Actions Needed

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Conservation Action Needed	Notes
2. Land/water management -> 2.1. Site/area management	-

Research Needed

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Research Needed	Notes
1. Research -> 1.3. Life history & ecology	-
3. Monitoring -> 3.1. Population trends	-

Additional Data Fields

Distribution
Estimated area of occupancy (AOO) (km ²): 80-300
Continuing decline in area of occupancy (AOO): Unknown
Extreme fluctuations in area of occupancy (AOO): No
Estimated extent of occurrence (EOO) (km ²): 17494
Continuing decline in extent of occurrence (EOO): Unknown
Extreme fluctuations in extent of occurrence (EOO): No
Continuing decline in number of locations: Unknown
Extreme fluctuations in the number of locations: No
Lower elevation limit (m): 270
Upper elevation limit (m): 1,900
Population
Continuing decline of mature individuals: Unknown
Extreme fluctuations: No
Population severely fragmented: No
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Yes

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