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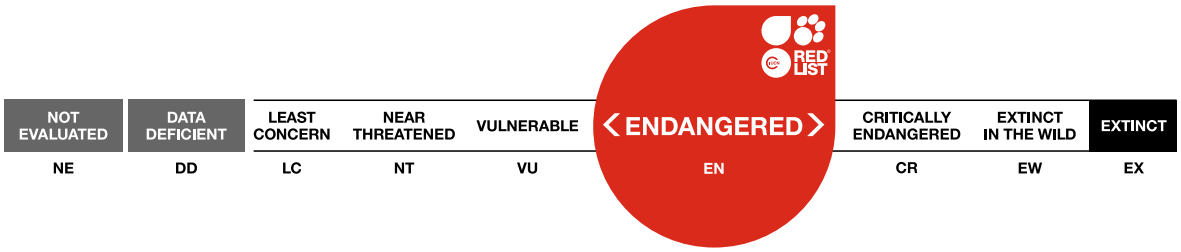
Pseudoblothrus vulcanus

Assessment by: Nunes, R. & Borges, P.A.V.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Pseudoscorpiones	Syarinidae

Scientific Name: *Pseudoblothrus vulcanus* Mahnert, 1990

Assessment Information

Red List Category & Criteria: Endangered B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v) ver 3.1

Year Published: 2021

Date Assessed: March 30, 2018

Justification:

Pseudoblothrus vulcanus is an Azorean-endemic, cave-adapted species from the islands of Pico and Terceira (Azores, Portugal). It has a small extent of occurrence (EOO = 1,525 km²) and a small area of occupancy (AOO = 20 km²). The species is relatively common and known from eight isolated subpopulations in lava tubes. However, the area surrounding the caves is heavily impacted by human activities. Further research is needed into its population, ecology and life history. A habitat management plan is needed and one is anticipated to be developed during the coming years. We also suggest as future measures of conservation the regular monitoring of the species (every ten years) and limiting access to the caves. The fact that the species is a cave-adapted species and occurs on two islands may imply that there are two cryptic species, so there is the urgent need of a taxonomic revision of this taxon. The species is assessed as Endangered (EN), mostly due to its small range, population fragmentation and decline in its habitat quality.

Geographic Range

Range Description:

Pseudoblothrus vulcanus is an Azorean-endemic cave adapted pseudoscorpion species known from Pico and Terceira islands (Azores, Portugal) (Borges *et al.* 2010). Originally described from Gruta das Agulhas (Terceira), it is present in a total of eight caves and lava tubes in both islands; Furna da Baliza, Furna do Frei Matias and Furna Nova (Pico); Gruta das Agulhas, Gruta do Coelho, Gruta da Malha, Gruta dos Principiantes and Gruta de Santa Maria (Terceira). The extent of occurrence (EOO) is 1,525 km² and the maximum estimated area of occupancy (AOO) is 20 km².

Country Occurrence:

Native, Extant (resident): Portugal (Azores)

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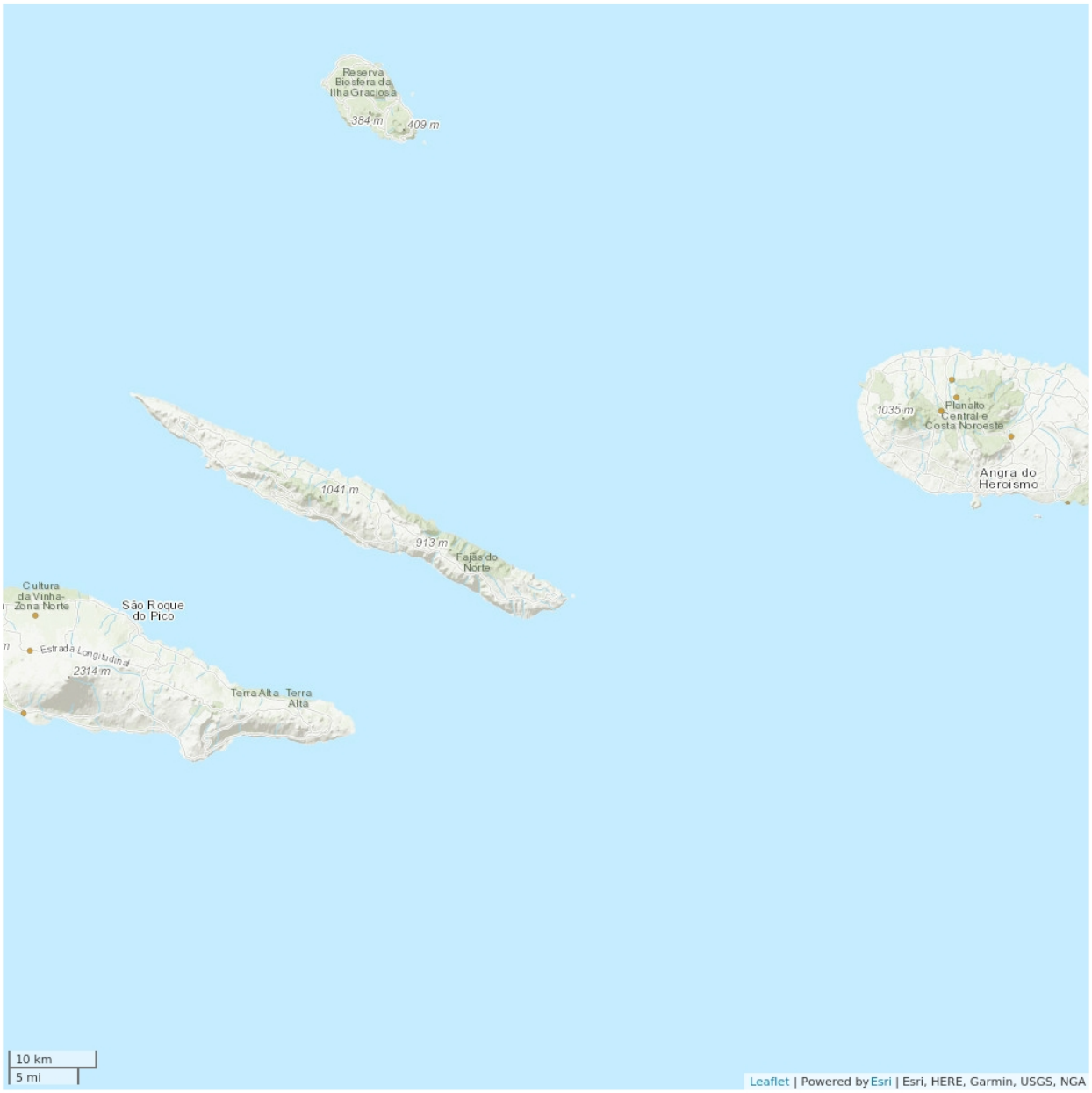
Distribution Map



Legend

EXTANT (RESIDENT)

Compiled by:

Azorean Biodiversity Group 2018

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

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Population

This species is apparently quite common (Borges *et al.* 2015), occurring in eight volcanic caves in Pico (Furna da Baliza, Furna do Frei Matias and Furna Nova) and Terceira (Gruta das Agulhas, Gruta do Coelho, Gruta da Malha, Gruta dos Principiantes and Gruta de Santa Maria) islands. This species is assessed here as severely fragmented as at least 50% of its population can be found in subpopulations/in habitat patches that are 1) smaller than would be required to support a viable population, and 2) separated from other habitat patches by a large distance, with many of the caves being surrounded by highly degraded habitats, agricultural land and urban areas.

Current Population Trend: Decreasing

Habitat and Ecology **(see Appendix for additional information)**

There is limited information regarding this species' ecology and life-history. It occurs in eight lava tubes, some in protected areas (Natural parks of Pico and Terceira), others are surrounded by highly disturbed or urbanized areas, and two are coastal caves. The genus *Pseudoblothrus* is exclusively cave-dwelling (Mahnert 1990). Specimens have been found near the entrance of the caves, under rotting wood and other organic litter. It is a cavernicolous (i.e. a troglobitic species) predator and/or saprophagous species. Its eyes are more developed than those of *P. oromii* (Mahnert 1990).

Systems: Terrestrial

Threats **(see Appendix for additional information)**

The main current threats to this species are the degradation of habitat quality due to the impact of agricultural activities and livestock raising, agricultural and domestic pollution and recreational cave visitation. Additionally, invasive plant species altering the habitat at the entrance of the caves might also impact the overall habitat quality in the caves. There are also several future potential threats: climatic changes (see Ferreira *et al.* 2016) that can change the conditions inside the cave; changes in the road infrastructure around the cave; potential human recreational activities with cave visitation; and geological events (volcanic activity and earthquakes).

Conservation Actions **(see Appendix for additional information)**

The species is protected by regional law (RAA 2012), as are some of the caves where it occurs (Natural Parks of Pico and Terceira). Land-use changes are one of the main current and future threats, and conservation and restoration measures should be extended beyond the caves. Further research is needed into its population, ecology and life history. The fact that the species is a cave adapted species and occurs on two islands may imply that we are in the presence of two cryptic species; therefore, there is the urgent need of a taxonomic revision of this taxon. A monitoring plan for the invertebrate community is necessary in order to contribute to the conservation of this species. As a future conservation measure, the restriction of visits to the caves could be considered. A habitat management plan is needed and one is anticipated to be developed during the coming years.

Credits

Assessor(s): Nunes, R. & Borges, P.A.V.

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Reviewer(s): Russell, N.

Authority/Authorities: IUCN SSC Spider and Scorpion Specialist Group

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External Resources

For Supplementary Material, and for Images and External Links to Additional Information, please see the Red List website.

Appendix

Habitats

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

Habitat	Season	Suitability	Major Importance?
7. Caves and Subterranean Habitats (non-aquatic) -> 7.1. Caves and Subterranean Habitats (non-aquatic) - Caves	Resident	Suitable	Yes

Threats

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

Threat	Timing	Scope	Severity	Impact Score
1. Residential & commercial development -> 1.1. Housing & urban areas	Ongoing	Minority (50%)	Rapid declines	Medium impact: 6
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.2. Species disturbance		
2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.2. Small-holder farming	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
2. Agriculture & aquaculture -> 2.2. Wood & pulp plantations -> 2.2.1. Small-holder plantations	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.2. Small-holder grazing, ranching or farming	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
4. Transportation & service corridors -> 4.1. Roads & railroads	Future	Minority (50%)	Very rapid declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
6. Human intrusions & disturbance -> 6.1. Recreational activities	Ongoing	Majority (50-90%)	Causing/could cause fluctuations	Medium impact: 6
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		

		1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.2. Species disturbance		
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.1. Unspecified species	Ongoing	Minority (50%)	Causing/could cause fluctuations	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.2. Species disturbance		
9. Pollution -> 9.1. Domestic & urban waste water -> 9.1.2. Run-off	Ongoing	Minority (50%)	Rapid declines	Medium impact: 6
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
9. Pollution -> 9.3. Agricultural & forestry effluents -> 9.3.1. Nutrient loads	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
9. Pollution -> 9.3. Agricultural & forestry effluents -> 9.3.3. Herbicides and pesticides	Ongoing	Minority (50%)	Very rapid declines	Medium impact: 7
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
10. Geological events -> 10.1. Volcanoes	Future	Majority (50-90%)	Very rapid declines	Medium impact: 6
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
10. Geological events -> 10.2. Earthquakes/tsunamis	Future	Minority (50%)	Slow, significant declines	Low impact: 3
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
11. Climate change & severe weather -> 11.1. Habitat shifting & alteration	Future	Whole (>90%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
11. Climate change & severe weather -> 11.2. Droughts	Future	Whole (>90%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		

Conservation Actions in Place

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

Conservation Action in Place
In-place research and monitoring
Action Recovery Plan: No
Systematic monitoring scheme: No
In-place land/water protection
Conservation sites identified: Yes, over part of range
Percentage of population protected by PAs: 21-30
Occurs in at least one protected area: Yes

Conservation Actions Needed

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

Conservation Action Needed
1. Land/water protection -> 1.1. Site/area protection
2. Land/water management -> 2.1. Site/area management
2. Land/water management -> 2.2. Invasive/problematic species control
4. Education & awareness -> 4.3. Awareness & communications
5. Law & policy -> 5.1. Legislation -> 5.1.3. Sub-national level

Research Needed

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

Research Needed
1. Research -> 1.1. Taxonomy
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.3. Life history & ecology
2. Conservation Planning -> 2.2. Area-based Management Plan
3. Monitoring -> 3.1. Population trends
3. Monitoring -> 3.4. Habitat trends

Additional Data Fields

https://dx.doi.org/10.2305/IUCN.UK.2021-1.RLTS.T119451417A124930591.en

Distribution
Estimated area of occupancy (AOO) (km²): 20
Continuing decline in area of occupancy (AOO): Yes
Extreme fluctuations in area of occupancy (AOO): Unknown
Estimated extent of occurrence (EOO) (km²): 1525
Continuing decline in extent of occurrence (EOO): Yes
Extreme fluctuations in extent of occurrence (EOO): Unknown
Number of Locations: 8
Continuing decline in number of locations: Yes
Extreme fluctuations in the number of locations: No
Lower elevation limit (m): 5
Upper elevation limit (m): 700
Population
Continuing decline of mature individuals: Yes
Extreme fluctuations: Unknown
Population severely fragmented: Yes
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Yes

The IUCN Red List Partnership

The IUCN Red List of Threatened Species™ is produced and managed by the IUCN Global Species Programme, the IUCN Species Survival Commission (SSC) and The IUCN Red List Partnership.

The IUCN Red List Partners are: Arizona State University; BirdLife International; Botanic Gardens Conservation International; Conservation International; NatureServe; Royal Botanic Gardens, Kew; Sapienza University of Rome; Texas A&M University; and Zoological Society of London.