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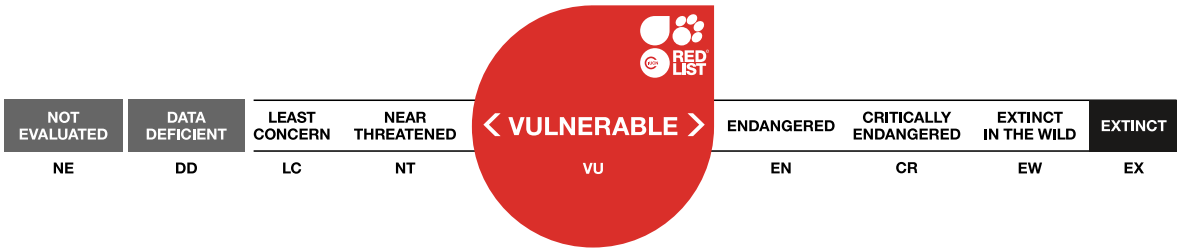
Rugathodes pico, Cave Cobweb Spider

Assessment by: Borges, P.A.V. & Cardoso, P.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Arachnida	Araneae	Theridiidae

Scientific Name: *Rugathodes pico* (Merrett & Ashmole, 1989)

Synonym(s):

- *Theridion pico* Merrett & Ashmole, 1989

Common Name(s):

- English: Cave Cobweb Spider

Taxonomic Source(s):

Platnick, N.I. 2014. The World Spider Catalog, Version 14.5. P. Merrett & H.D. Cameron (eds). American Museum of Natural History. Available at: http://research.amnh.org/iz/spiders/catalog/index.html. (Accessed: 31 March 2014).

Taxonomic Notes:

The species belongs in the *Theridion sexpunctatum* group.

Assessment Information

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

Year Published: 2021

Date Assessed: June 25, 2017

Justification:

Rugathodes pico is a cave adapted Azorean-endemic species known from Pico and Faial (Azores, Portugal). It has a small extent of occurrence (EOO = 302 km²) and area of occupancy (AOO = 24-28 km²). The species is particularly rare in most caves and only known from seven isolated natural subpopulations. The main current threat to this species is the impact of agriculture activities, namely the expansion of wine production and domestic pollution. However, each subpopulation is under several different future threats. The species is assessed as Vulnerable (VU), mostly due to its small area of occupancy (AOO), a decline of habitat quality and the many ongoing and future threats. We suggest as future measure of conservation the regular monitoring of the species (every ten years) and fencing the entrances of the caves where human intrusion and disturbance has been occurring.

Geographic Range

Range Description:

Rugathodes pico is a cave-adapted species known from Pico and Faial (Azores, Portugal) (Borges *et al.* 2010), occurring in seven volcanic caves in Faial (Furna Ruim) and Pico (Furna dos Montanheiros, Gruta das Canárias, Gruta da Agostinha, Gruta do Henrique Maciel, Gruta do Mistério da Silveira I, Gruta do Soldão) (Pereira *et al.* 2016). The Extent of Occurrence (EOO) is *c.* 302 km^2 and the maximum estimated

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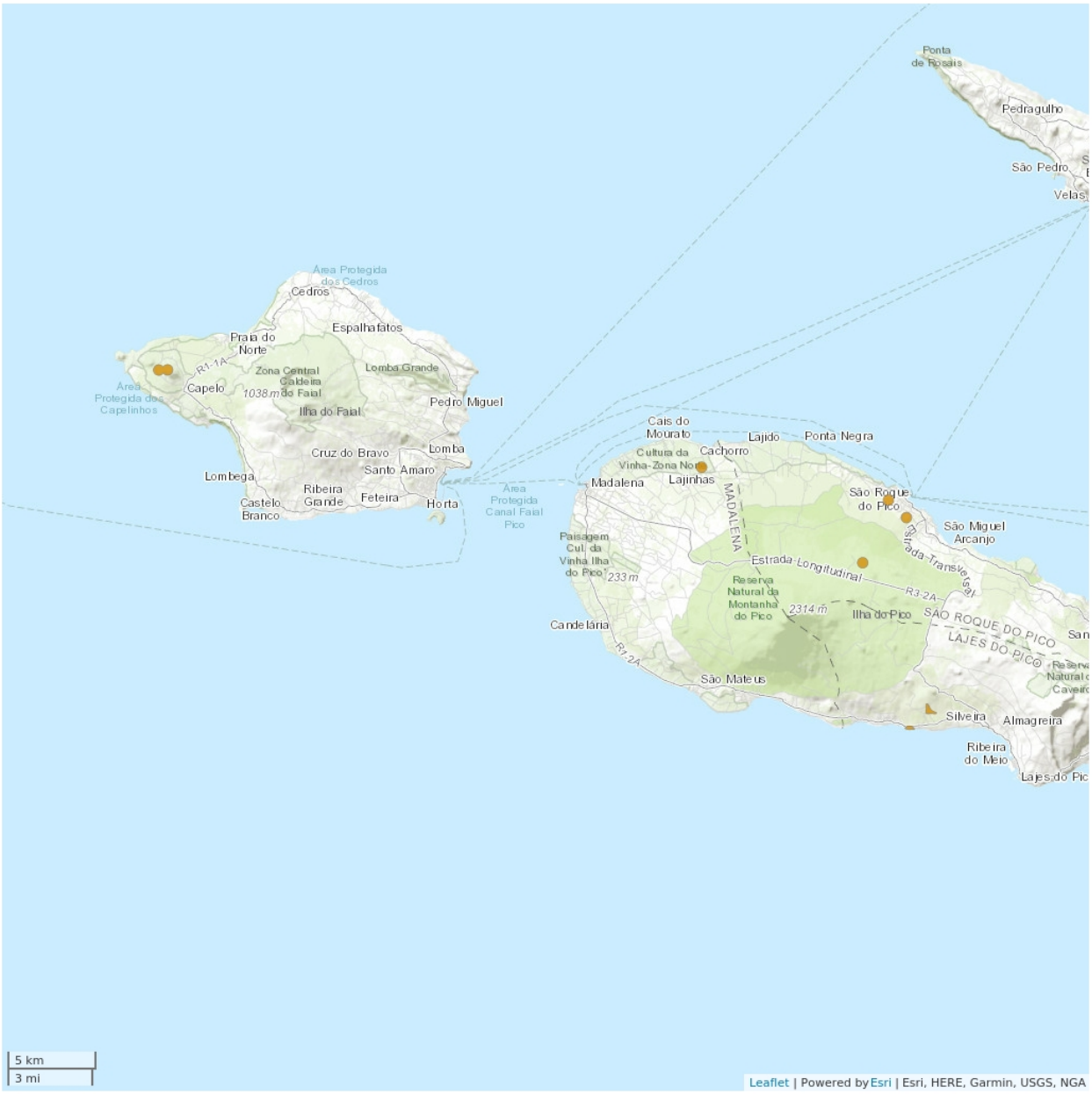
Area of Occupancy (AOO) is 24-28 km^2.

Country Occurrence:

Native, Extant (resident): Portugal (Azores)

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

Seven subpopulations of this species can be found across two islands, but most of them are very small and located in disturbed lava tubes. A single large subpopulation is located in Gruta da Agostinha, which is under future threat due to increasing possibility of land-use changes for wine production.

Current Population Trend: Decreasing

Habitat and Ecology (see Appendix for additional information)

The species is a troglobite specialist, occurring only in humid lava tubes and volcanic pits. *Rugathodes pico*'s adaptations related to cave life are the very pale colour, the long spines and hairs, and the extreme length of the legs (Merrett and Ashmole 1989). The species builds cobwebs in open spaces and across small holes in the volcanic basaltic rock. Usually it occurs in twilight conditions near cave openings to deep parts of the caves. In the cave with the larger subpopulation (Gruta da Agostinha) the species occurs in all sections of the cave.

Systems: Terrestrial

Threats (see Appendix for additional information)

The main current threats to this species are domestic pollution in caves near houses and the impact of agricultural activities (namely the expansion of wine production and cattle management). However, there are several future potential threats: climatic changes (see Ferreira *et al.* 2016) that can change the conditions inside the caves; urban development in coastal areas, changes in the road infrastructure around the caves; logging of *Pittosporum undulatum* exotic forests over the caves; potential human recreational activities with radical cave visitation; and increased frequency of geological events (volcanic activity).

Conservation Actions (see Appendix for additional information)

The species is not protected by regional law. Some of the caves are included in the Natural Park of Faial and Pico. Since land-use changes (for *Pittosporum undulatum* removal, urban development, wine production) is the main current and future threat, it might be important to safeguard the species survival in the future and conservation should be extended beyond the current area, possibly allowing the recovery of other caves to original conditions where the species might be reintroduced. Further research is needed into its ecology and life history in order to find extant specimens in additional caves. An area-based management plan is also necessary for the most disturbed caves including invertebrate monitoring to contribute to a potential species recovery plan.

Credits

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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	Future	Minority (50%)	Rapid declines	Low impact: 4
	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		
2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.3. Agro-industry farming	Ongoing	Majority (50-90%)	Rapid declines	Medium impact: 7
	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		
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.2. Small-holder grazing, ranching or farming	Ongoing	Majority (50-90%)	Slow, significant declines	Medium impact: 6
	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		
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 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
5. Biological resource use -> 5.3. Logging & wood harvesting -> 5.3.4. Unintentional effects: (large scale) [harvest]	Future	Majority (50-90%)	Rapid declines	Low impact: 5
	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		

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6. Human intrusions & disturbance -> 6.1. Recreational activities	Ongoing	Minority (50%)	Causing/could cause fluctuations	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.2. Species disturbance		
9. Pollution -> 9.1. Domestic & urban waste water -> 9.1.1. Sewage	Ongoing	Minority (50%)	Rapid declines	Medium impact: 6
	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		
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 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%)	Very rapid declines	Medium impact: 7
	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 -> 11.2. Droughts	Future	Whole (>90%)	Very rapid declines	Medium impact: 7
	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		

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
Area based regional management plan: No
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 -> 1.2. Resource & habitat protection
2. Land/water management -> 2.1. Site/area management
3. Species management -> 3.3. Species re-introduction -> 3.3.1. Reintroduction
4. Education & awareness -> 4.1. Formal education
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 -> 1.2. Population size, distribution & trends
1. Research -> 1.3. Life history & ecology
2. Conservation Planning -> 2.1. Species Action/Recovery Plan
2. Conservation Planning -> 2.2. Area-based Management Plan
3. Monitoring -> 3.1. Population trends
3. Monitoring -> 3.4. Habitat trends

Additional Data Fields

Distribution
Estimated area of occupancy (AOO) (km²): 24-28
Continuing decline in area of occupancy (AOO): Yes
Extreme fluctuations in area of occupancy (AOO): Unknown
Estimated extent of occurrence (EOO) (km²): 302
Continuing decline in extent of occurrence (EOO): Yes
Extreme fluctuations in extent of occurrence (EOO): No
Number of Locations: 7
Continuing decline in number of locations: Yes
Lower elevation limit (m): 10
Upper elevation limit (m): 790
Population
Continuing decline of mature individuals: Yes
Population severely fragmented: No

Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Yes
Generation Length (years): 1

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