The IUCN Red List of Threatened Species™
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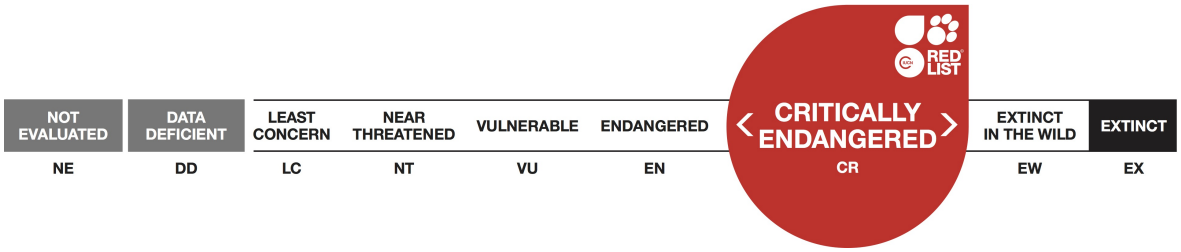
Scope: Global
Language: English

Trechus montanheirorum, Cave ground-beetle

Assessment by: Borges, P.A.V. & Amorim, I.R.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Insecta	Coleoptera	Carabidae

Taxon Name: *Trechus montanheirorum* Oromí & Borges, 1991

Common Name(s):

- English: Cave ground-beetle

Taxonomic Source(s):

GBIF. 2016. Global Biodiversity Information Facility. Available at: http://www.gbif.org/.

Assessment Information

Red List Category & Criteria: Critically Endangered B1ab(i,ii,iii,iv) ver 3.1

Year Published: 2018

Date Assessed: November 28, 2016

Justification:

Trechus montanheirorum is an endemic species from Pico (Azores, Portugal) . It has a very small extent of occurrence (EOO = 12 km²) and reduced area of occupancy (AOO = 12 km²). The species is very rare and only known from three genetically isolated natural subpopulations. The main current threat to this species is cave visitation by tourists and the impact of agriculture activities. We suggest as future measures 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. The species is assessed as Critically Endangered (CR), mostly due to its small extend of occurrence (EOO) and area of occupancy (AOO), population fragmentation and decline of habitat quality.

Geographic Range

Range Description:

Trechus montanheirorum is an endemic cave adapted species known from Pico (Azores, Portugal) (Borges *et al.* 2010), occurring in only three lava tube caves (Furna de Frei Matias, Furna dos Montanheiros and Gruta dos Vimes). The extent of occurrence (EOO) is 12 km² and the maximum estimated area of occupancy (AOO) is 12 km².

Country Occurrence:

Native: Portugal (Azores)

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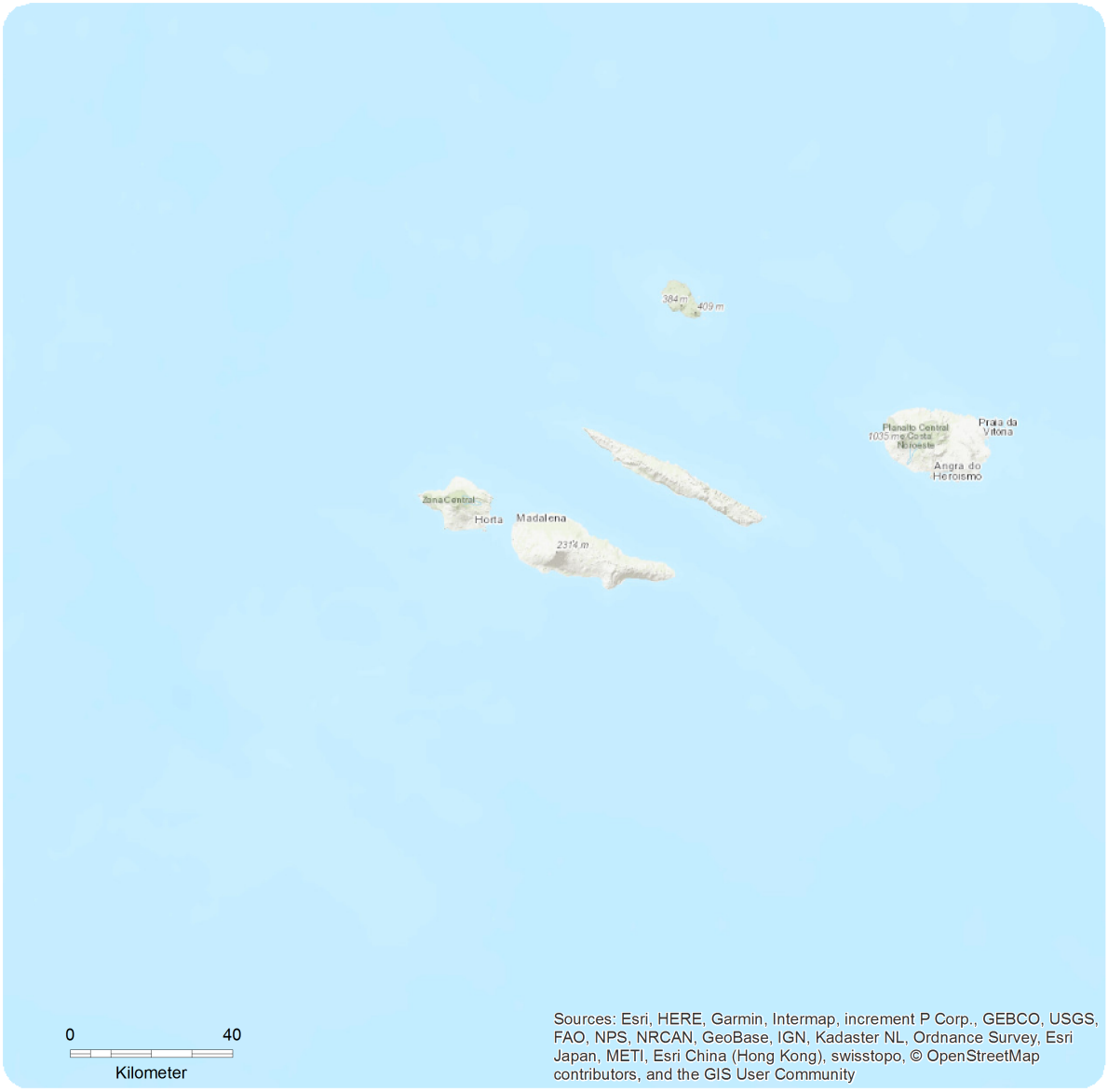
Distribution Map

Trechus montanheirorum



Range

Extant (resident)

Compiled by:

Paulo Borges

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

The species is relatively abundant in at least one of the caves (Furna dos Montanheiros). Based on genetic analysis, the species is formed by three subpopulations very fragmented (Amorim 2015). The area surrounding one of the the caves (Furna dos Montanheiros) is relatively well protected, but the area surrounding the other two caves is more disturbed. Therefore we assume relatively few impacts for the population. However, tourism visitation could be a problem as well agriculture management in two of the caves. 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. In fact, the species occurs in caves that are isolated in a sea of pastures and *Cryptomeria japonica* plantations.

Current Population Trend: Stable

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

This species occurs in three caves of Pico island (Furna de Frei Matias, Furna dos Montanheiros and Gruta dos Vimes). This species has some ability to colonise the entrances of caves, but no specimens were ever collected outside of a cave (Oromí & Borges 1991; Amorim 2015). It is a cavernicolous (i.e. a troglobitic species) predator and/or saprophagous species.

Systems: Terrestrial

Use and Trade

The species is not utilised.

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

The main current threats to this species are the loss of habitat quality, due to recreational cave visitation and impact of pasture lands. However, there are several future potential threats: climatic changes (see Ferreira et al. 2016) that can change the conditions inside the caves; change in the road infrastructure around the cave; potential human recreational activities with radical cave visitation; reforestation of the area with exotic trees with unknown impact and geological events (volcanic activity and earthquakes).

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

The species is protected by regional law (RAA 2008). Its habitat is in a regionally protected area (Natural Park of Pico), but only one of the three caves where this species occurs is within a regionally protected area. Further research is needed into its ecology and life history in order to find extant specimens in more caves. It is necessary a monitoring plan for the invertebrate community in the cave habitat in order to contribute to the conservation of this species. We suggest as future measure of conservation the fencing the entrances of the caves where human intrusion and disturbance has been occurring. A habitat management plan is needed and anticipated to be developed during the coming years.

Credits

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

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Reviewer(s): Danielczak, A.

Contributor(s): Lamelas-López, L.

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External Resources

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
10. Geological events -> 10.1. Volcanoes	Future	Whole (>90%)	Very rapid declines	Medium impact: 7
	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	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 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects 2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
1. Residential & commercial development -> 1.3. Tourism & recreation areas	Ongoing	Majority (50-90%)	Slow, significant declines	Medium impact: 6
	Stresses:	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%)	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		
11. Climate change & severe weather -> 11.2. Droughts	Future	Whole (>90%)	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		
2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.2. Small-holder farming	Ongoing	Whole (>90%)	Slow, significant declines	Medium impact: 7
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		

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		2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
2. Agriculture & aquaculture -> 2.2. Wood & pulp plantations -> 2.2.2. Agro-industry plantations	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 -> 2.2. Species disturbance		
4. Transportation & service corridors -> 4.1. Roads & railroads	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		
6. Human intrusions & disturbance -> 6.1. Recreational activities	Ongoing	Whole (>90%)	Slow, significant declines	Medium impact: 7
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.2. Species disturbance		

Conservation Actions in Place

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

Conservation Actions in Place
In-Place Land/Water Protection and Management
Conservation sites identified: Yes, over entire range
Occur in at least one PA: Yes
Percentage of population protected by PAs (0-100): 81-90

Conservation Actions Needed

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

Conservation Actions Needed
2. Land/water management -> 2.1. Site/area management
4. Education & awareness -> 4.1. Formal education
5. Law & policy -> 5.4. Compliance and enforcement -> 5.4.3. 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 -> 2.2. Area-based Management Plan

Research Needed
3. Monitoring -> 3.1. Population trends
3. Monitoring -> 3.4. Habitat trends

Additional Data Fields

Distribution
Estimated area of occupancy (AOO) (km²): 12
Continuing decline in area of occupancy (AOO): Yes
Estimated extent of occurrence (EOO) (km²): 12
Continuing decline in extent of occurrence (EOO): Yes
Number of Locations: 3
Continuing decline in number of locations: Yes
Extreme fluctuations in the number of locations: Unknown
Lower elevation limit (m): 580
Upper elevation limit (m): 770
Population
Continuing decline of mature individuals: Unknown
Population severely fragmented: Yes
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Yes
Generation Length (years): 1
Movement patterns: Not a Migrant

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The IUCN Red List Partnership

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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.