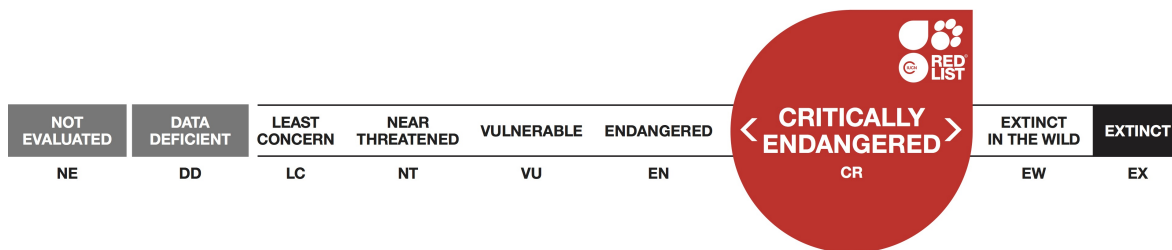




Tarphius serranoi, Ironclad Beetle

Assessment by: Borges, P.A.V. & Lamelas-López, L.



View on www.iucnredlist.org

Citation: Borges, P.A.V. & Lamelas-López, L. 2017. *Tarphius serranoi*. *The IUCN Red List of Threatened Species 2017*: e.T112215669A112215674. <http://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T112215669A112215674.en>

Copyright: © 2017 International Union for Conservation of Nature and Natural Resources

Reproduction of this publication for educational or other non-commercial purposes is authorized without prior written permission from the copyright holder provided the source is fully acknowledged.

Reproduction of this publication for resale, reposting or other commercial purposes is prohibited without prior written permission from the copyright holder. For further details see [Terms of Use](#).

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](#).

If you see any errors or have any questions or suggestions on what is shown in this document, please provide us with [feedback](#) so that we can correct or extend the information provided.

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Insecta	Coleoptera	Zopheridae

Taxon Name: *Tarphius serranoi* Borges, 1991

Common Name(s):

- English: Ironclad Beetle

Taxonomic Source(s):

Borges, P.A.V., Amormin, I.R., Terzopoulou, S. Rigal, F., Emerson, B.C. and Serrano, A.R.M. 2017. Cryptic diversity in the Azorean beetle genus *Tarphius* Erichson, 1845 (Coleoptera: Zopheridae): An integrative taxonomic approach with description of four new species. *Zootaxa* 4236(3): 401-449 DOI: <http://dx.doi.org/10.11646/zootaxa.4236.3.1>.

Assessment Information

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

Year Published: 2017

Date Assessed: April 5, 2017

Justification:

Tarphius serranoi is a single-island endemic species restricted to S. Maria island (Azores, Portugal) (Borges *et al.* 2010, 2017). It is a very rare species, with a restricted extent of occurrence (8 km²) and area of occupancy (8 km²). There is a continuing decline in the EOO, AOO, extent and quality of habitat as well as the number of mature individuals as a result of the invasions of non-native plants. The species is very rare, and only occurs in a small patch of native forest, dominated by *Erica azorica* and *Picconia azorica*, in S. Maria island. In the past, the species has probably strongly declined due to changes in habitat size. Therefore, we suggest as future measures of conservation: (1) a long-term monitoring plan of the species; and (2) control of invasive species. The species is therefore assessed as Critically Endangered (CR).

Geographic Range

Range Description:

Tarphius serranoi is a single-island endemic species restricted to S. Maria island (Azores, Portugal) (Borges *et al.* 2010, 2017), known from Natural Forest Reserve of Pico Alto (S. Maria). The extent of occurrence (EOO) is 8 km² and the maximum estimated area of occupancy (AOO) is 8 km².

Country Occurrence:

Native: Portugal (Azores)

Distribution Map

Tarphius serranoi



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.



Population

The species is very rare and only occurs in a small patch of native forest in Sta. Maria island (Borges *et al.* 2017). A continuing decline in the number of mature individuals is inferred from monitoring schemes and from the ongoing habitat degradation due to invasions of alien plants (namely *Pittosporum undulatum* and *Hedychium gardnerianum*) and the *Cryptomeria japonica* management (Borges *et al.* 2017).

Current Population Trend: Decreasing

Habitat and Ecology (see Appendix for additional information)

The species is very rare, and only occurs in a small patch of native forest, dominated by *Erica azorica* and *Picconia azorica*, in Sta. Maria island (Borges *et al.* 2017). It has an altitudinal range between 400 and 500 m. It is a nocturnal fungivorous species that lives associated with lichens in tree canopies, but also in the soil.

Systems: Terrestrial

Use and Trade

This species is not utilised.

Threats (see Appendix for additional information)

In the past, the species has probably strongly declined due to changes in habitat size and quality (Triantis *et al.* 2010). Currently, the rapid advance and expansion of invasive plants species is the major threat (Borges *et al.* 2017), particularly *Hedychium gardnerianum* and *Pittosporum undulatum*, that are changing the habitat structure, namely decreasing the cover of bryophytes and ferns in the soil and promoting the spread of other plants. Based on Ferreira *et al.* (2016) the habitat will further decline as a consequence of climate change (increasing number of droughts and habitat shifting and alteration).

Conservation Actions (see Appendix for additional information)

The species is protected by regional law (RAA 2012). Its habitat is in a regionally protected area (Natural Forest Reserve of Pico Alto in Santa Maria island). Degraded habitats should be restored with the removal of invasive species. A strategy needs also to be developed to address the future threat by climate change. A habitat management plan is needed and anticipated to be developed during the coming years. Since this species is an icone of the relict native Azorean forests, it is suggested that some awareness measures should be put in practice. Further research is needed into its ecology and life history in order to find additional extant specimens in areas of exotic plantations around Pico Alto (S. Maria) and obtain information on population size, distribution and trends. It is also necessary an area-based management plan and a monitoring plan for the invertebrate community in the habitat in order to contribute to perform a species potential recovery plan. Monitoring every ten years using the BALA protocol will inform about habitat quality (see e.g. Gaspar *et al.* 2011).

Credits

Assessor(s): Borges, P.A.V. & Lamelas-López, L.

Reviewer(s): Danielczak, A.

Bibliography

Borges, P.A.V., Amormin, I.R., Terzopoulou, S. Rigal, F., Emerson, B.C. and Serrano, A.R.M. 2017. Cryptic diversity in the Azorean beetle genus *Tarphius* Erichson, 1845 (Coleoptera: Zopheridae): An integrative taxonomic approach with description of four new species. *Zootaxa* 4236(3): 401-449 DOI: <http://dx.doi.org/10.11646/zootaxa.4236.3.1>.

Borges, P.A.V., Costa, A., Cunha, R., Gabriel, R., Gonçalves, V., Martins, A.F., Melo, I., Parente, M., Raposeiro, P., Rodrigues, P., Santos, R.S., Silva, L., Vieira, P. & Vieira, V. 2010. *A list of the terrestrial and marine biota from the Azores*. Príncipe, Cascais.

Ferreira, M.T., Cardoso, P., Borges, P.A.V., Gabriel, R., Azevedo, E.B., Reis, F., Araújo, M.B. and Elias, R.B. 2016. Effects of climate change on the distribution of indigenous species in oceanic islands (Azores). *Climate Change* 138: 603-615.

Gaspar, C., Gaston, K.J., Borges, P.A.V. and Cardoso, P. 2011. Selection of priority areas for arthropod conservation in the Azores archipelago. *Journal of Insect Conservation* 15: 671–684.

IUCN. 2017. The IUCN Red List of Threatened Species. Version 2017-3. Available at: www.iucnredlist.org. (Accessed: 7 December 2017).

RAA - Região Autónoma dos Açores. 2008. *Regime jurídico da conservação da natureza e da proteção da biodiversidade - Decreto Legislativo Regional n.º 15/2012/A de 2 de Abril*.

Triantis, K.A., Borges, P.A.V., Ladle, R.J., Hortal, J., Cardoso, P., Gaspar, C., Dinis, F., Mendonça, E., Silveira, L.M.A., Gabriel, R., Melo, C., Santos, A.M.C., Amorim, I.R., Ribeiro, S.P., Serrano, A.R.M., Quartau, J.A. and Whittaker, R.J. 2010. Extinction debt on oceanic islands. *Ecography* 33: 285-294.

Citation

Borges, P.A.V. & Lamelas-López, L. 2017. *Tarphius serranoi*. *The IUCN Red List of Threatened Species 2017*: e.T112215669A112215674. <http://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T112215669A112215674.en>

Disclaimer

To make use of this information, please check the [Terms of Use](#).

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?
1. Forest -> 1.4. Forest - Temperate	Resident	Suitable	Yes

Threats

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

Threat	Timing	Scope	Severity	Impact Score
11. Climate change & severe weather -> 11.1. Habitat shifting & alteration	Future	Whole (>90%)	Slow, significant 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		
11. Climate change & severe weather -> 11.2. Droughts (<i>Pittosporum undulatum</i>)	Ongoing	Whole (>90%)	Slow, significant declines	Medium impact: 7
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		
2. Agriculture & aquaculture -> 2.2. Wood & pulp plantations -> 2.2.1. Small-holder plantations (<i>Hedychium gardnerianum</i>)	Ongoing	Minority (50%)	Causing/could cause fluctuations	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		
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (<i>Pittosporum undulatum</i>)	Ongoing	Whole (>90%)	Rapid declines	High impact: 8
	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		
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (<i>Hedychium gardnerianum</i>)	Ongoing	Majority (50-90%)	Rapid 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 part of range
Occur in at least one PA: Yes
Percentage of population protected by PAs (0-100): 81-90
Area based regional management plan: Unknown

Conservation Actions Needed

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

Conservation Actions Needed
2. Land/water management -> 2.1. Site/area management
2. Land/water management -> 2.2. Invasive/problematic species control
2. Land/water management -> 2.3. Habitat & natural process restoration
4. Education & awareness -> 4.1. Formal education
4. Education & awareness -> 4.3. Awareness & communications
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
3. Monitoring -> 3.1. Population trends
3. Monitoring -> 3.4. Habitat trends

Additional Data Fields

Distribution
Estimated area of occupancy (AOO) (km ²): 8
Continuing decline in area of occupancy (AOO): Yes
Extreme fluctuations in area of occupancy (AOO): Unknown
Estimated extent of occurrence (EOO) (km ²): 8

Distribution
Continuing decline in extent of occurrence (EOO): Yes
Extreme fluctuations in extent of occurrence (EOO): Unknown
Number of Locations: 1
Continuing decline in number of locations: Unknown
Extreme fluctuations in the number of locations: Unknown
Lower elevation limit (m): 400
Upper elevation limit (m): 500
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
Movement patterns: Not a Migrant

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](#).