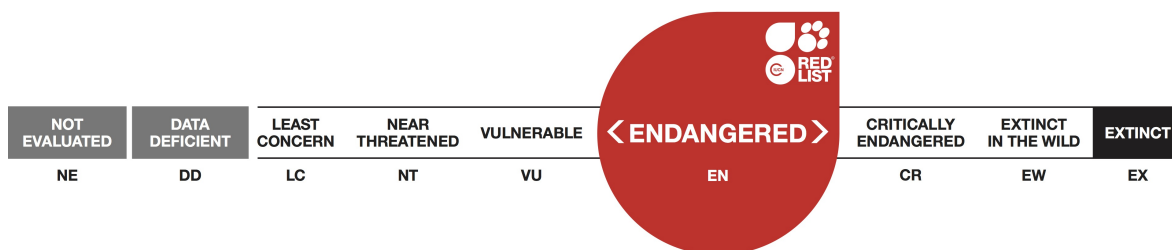


Cixius azopicavus, Cave lacehopper

Assessment by: Rego, C., Boieiro, M. & Borges, P.A.V.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Insecta	Hemiptera	Cixiidae

Taxon Name: *Cixius azopicavus* Hoch, 1991

Common Name(s):

- English: Cave lacehopper

Taxonomic Source(s):

De Jong, Y., Verbeek, M., Michelsen, V., Bjørn, P.P., Los, W., Steeman, F., Bailly, N., Basire, C., Chylarecki, P., Stloukal, E., Hagedorn, G., Wetzell, F.T., Glöckler, F., Kroupa, A., Korb, G., Hoffmann, A., Häuser, C., Kohlbecker, A., Müller, A., Güntsch, A., Stoev, P. and Penev, L. 2014. Fauna Europaea – all European animal species on the web. *Biodiversity Data Journal* 2: e4034. DOI: 10.3897/BDJ.2.e4034.

Assessment Information

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

Year Published: 2018

Date Assessed: January 31, 2017

Justification:

Cixius azopicavus is a cave lacehopper endemic to Pico Island (Azores, Portugal) (Borges *et al.* 2010). It has a very small extent of occurrence (EOO = 140 km²) and reduced area of occupancy (AOO = 24 km²). The species is very rare and only known from six genetically isolated natural subpopulations. The main threat to this species is above cave deforestation which will reduce the amount of suitable roots as food resources, increased nitrogen levels derived from the use of pesticides in neighbouring pastures and increased dryness due to climate change. We suggest as future measure of conservation the regular monitoring of the species (every ten years) and the creation of a fence in the entrance of the caves. The species is assessed as Endangered (EN), mostly due to fragmentation of the six populations and declining of AOO.

Geographic Range

Range Description:

Cixius azopicavus is a single island endemic cave lacehopper species from Pico Island (Azores, Portugal) (Borges *et al.* 2010), where it is restricted to six lava tubes (Furna dos Montanheiros, Gruta das Canárias, Gruta da Agostinha, Gruta do Mistério da Silveira I, Gruta do Soldão and Gruta das Torres). Its extent of occurrence (EOO) and area of occupancy (AOO) are 140 and 24 km² respectively.

Country Occurrence:

Native: Portugal (Azores)

Distribution Map

Cixius azopicavus

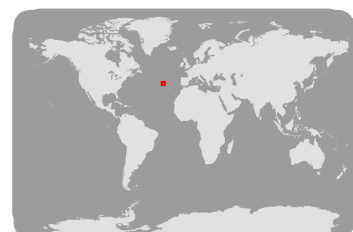


Range

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 only occurs in six lava tubes (caves) in Pico Island (Azores) and is particularly rare in terms of abundance in all caves. This species is assessed here as severely fragmented as at least 50% of its population can be found in subpopulations that are 1) smaller than would be required to support a viable population, and 2) separated from other habitat patches by a large distance. Some current impacts of agriculture are high

Current Population Trend: Decreasing

Habitat and Ecology (see Appendix for additional information)

This is a troglotic species (Hoch 1991) with low dispersal ability. It is known to feed on roots of the above cave vegetation. It only occurs in six lava tubes in Pico Island where it is restricted to the deep dark cave zone.

Systems: Terrestrial

Use and Trade

The species is not utilised.

Threats (see Appendix for additional information)

This species is threatened by above cave deforestation which will reduce the amount of suitable roots as food resources. Increasing nitrogen levels derived from the use of pesticides in neighbouring agricultural land are also a threat since they change the adequate cover by native trees and shrubs above ground. However, there are also 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 caves; potential human recreational activities with radical cave visitation and geological events (volcanic activity and earthquakes).

Conservation Actions (see Appendix for additional information)

This species is not protected by law in the Azores, but part of its distribution is included in protected areas namely in a protected landscape area (Furna dos Montanheiros inside de Pico Natural Park) and a natural monument (Gruta das Torres). Degraded habitats should be restored and a strategy needs to be developed to address the future threat by climate change that may change the vegetation cover of caves. Further research is needed into its ecology and life history in order to find extant specimens in additional caves. A habitat management plan with associated education outreach initiatives is needed and anticipated to be developed during the coming years. It is necessary a monitoring plan for the invertebrate community in the habitat in order to contribute to the conservation of this species.

Credits

Assessor(s): Rego, C., Boieiro, M. & Borges, P.A.V.

Reviewer(s): Danielczak, A.

Contributor(s): Lamelas-López, L.

**Facilitators(s) and
Compiler(s):** Hochkirch, A.

Bibliography

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*. Príncipeia, 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.

Hoch, H. 1991. Cave-dwelling Cixiidae (Homoptera, Fulgoroidea) from the Azores. *Boccagiana* 149: 1-9.

IUCN. 2018. The IUCN Red List of Threatened Species. Version 2018-1. Available at: www.iucnredlist.org. (Accessed: 28 June 2018).

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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%)	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	Unknown	-	-
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.2. Species disturbance		
11. Climate change & severe weather -> 11.1. Habitat shifting & alteration	Future	Unknown	Rapid declines	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.3. Indirect species effects -> 2.3.7. Reduced reproductive success		
11. Climate change & severe weather -> 11.2. Droughts	Future	Whole (>90%)	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		
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.2. Small-holder grazing, ranching or farming	Ongoing	Unknown	Rapid declines	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.3. Indirect species effects -> 2.3.7. Reduced reproductive success		
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.3. Agro-industry grazing, ranching or farming	Ongoing	Unknown	Rapid declines	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.3. Indirect species effects -> 2.3.7. Reduced reproductive success		

4. Transportation & service corridors -> 4.1. Roads & railroads	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		
6. Human intrusions & disturbance -> 6.1. Recreational activities	Future	Minority (50%)	Slow, significant declines	Low impact: 3
	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	Unknown	Rapid declines	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.3. Indirect species effects -> 2.3.7. Reduced reproductive success		
9. Pollution -> 9.3. Agricultural & forestry effluents -> 9.3.3. Herbicides and pesticides	Ongoing	Unknown	Rapid declines	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.3. Indirect species effects -> 2.3.7. Reduced reproductive success		

Conservation Actions in Place

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

Conservation Actions in Place
In-Place Research, Monitoring and Planning
Action Recovery plan: No
Systematic monitoring scheme: No
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): 31-40

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 -> 2.3. Habitat & natural process restoration
4. Education & awareness -> 4.1. Formal education

Conservation Actions Needed
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): 40
Continuing decline in area of occupancy (AOO): Yes
Extreme fluctuations in area of occupancy (AOO): Unknown
Estimated extent of occurrence (EOO) (km ²): 140
Continuing decline in extent of occurrence (EOO): Yes
Extreme fluctuations in extent of occurrence (EOO): Unknown
Number of Locations: 6
Continuing decline in number of locations: Yes
Extreme fluctuations in the number of locations: Unknown
Lower elevation limit (m): 10
Upper elevation limit (m): 770
Population
Continuing decline of mature individuals: Yes
Population severely fragmented: Yes
All individuals in one subpopulation: No
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Yes

Habitats and Ecology
Generation Length (years): 1
Movement patterns: Not a Migrant

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