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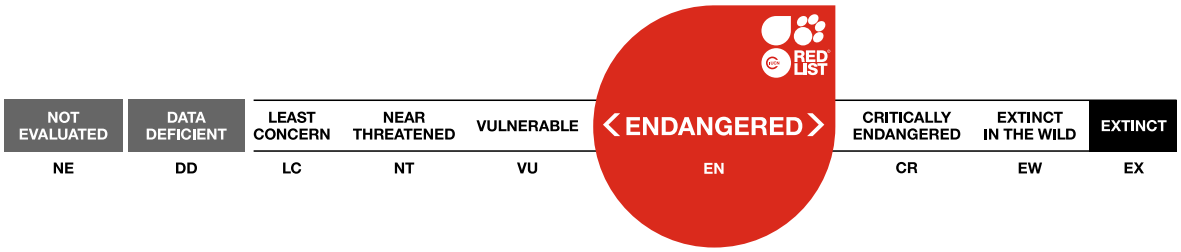
Megaselia leptofemur

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



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Insecta	Diptera	Phoridae

Scientific Name: *Megaselia leptofemur* Disney, 2007

Assessment Information

Red List Category & Criteria: Endangered B2ab(i,ii,iii) ver 3.1

Year Published: 2021

Date Assessed: March 27, 2018

Justification:

Megaselia leptofemur is an Azorean-endemic eutroglophile species known from Pico, Terceira and S. Miguel (Azores, Portugal). It has a small Extent of Occurrence (EOO = 8,880 km²) and a very small Area of Occupancy (AOO = 36 km²). The species is known from seven caves, and a small number of sites above ground. The areas surrounding some of the caves are heavily impacted by human activities, and the present situation of this species needs to be further assessed and further research is needed into its population, distribution, threats, 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 conservation measures the regular monitoring of the species and restricting human access to the caves where the species occurs. The species is assessed as Endangered (EN), mostly due to fragmentation of the seven subpopulations, decreasing habitat quality and a declining AOO.

Geographic Range

Range Description:

Megaselia leptofemur is a cave-dwelling Azorean-endemic species known from Pico, Terceira and S. Miguel islands (Azores, Portugal) (Borges *et al.* 2010), occurring in several caves and lava tubes: Furna dos Montanheiros and Gruta do Soldão (Pico); Gruta do Coelho (Terceira); Gruta do Enforcado, Gruta do Esqueleto, Gruta do Pico da Cruz and Gruta do Pico Queimado (S. Miguel), but also occurring above ground. The Extent of Occurrence (EOO) is 8,880 km² and the estimated Area of Occupancy (AOO) is 36 km².

Country Occurrence:

Native, Extant (resident): Portugal (Azores)

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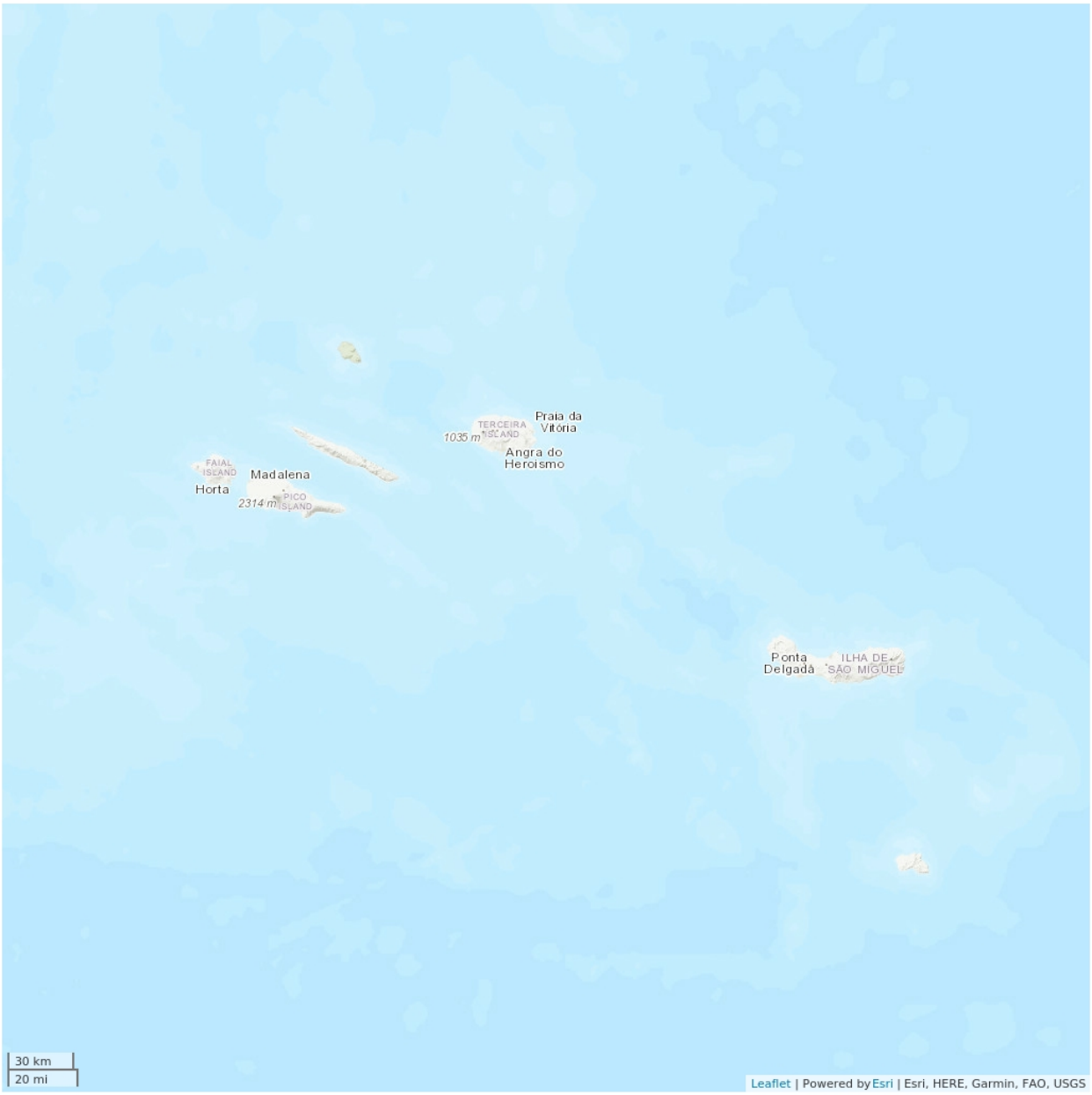
Distribution Map



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

Currently no population size estimates are known for this species. The species occurs in seven lava tubes in Pico, Terceira and S. Miguel islands (Azores). This species is assessed here as severely fragmented since at least 50% of its population can be found in habitat patches that are 1) smaller than would be required to support a viable population (caves are being highly disturbed), and 2) separated from other habitat patches (caves) by a large distance.

Current Population Trend: Unknown

Habitat and Ecology (see Appendix for additional information)

The ecology and traits of this species are unknown. Phorids are usually found in damp habitats, in the presence of different kinds of decomposing plant and animal matter, including human corpses (hence the name coffin flies), on flowers and fungi or on ant nests and beehives, among others. Larvae, besides being found in the aforementioned habitats can also be found in faeces, in gastropods, as internal parasites of other arthropods, or as parasites or commensals of ants and termites (McAlpine *et al.* 1987). Most adults feed on nectar or on the liquids exuded by carrion and dung. Some species can be a vector of food contamination. Some species of the genus *Megaselia* feed and develop on fungi and are considered pests of cultivated mushrooms, while others develop in decaying material organic material, trash and sewers or on carrion. *Megaselia leptofemur* is an eutroglophile species (i.e. epigean species able to maintain a permanent subterranean population), being known from seven lava tubes in three islands.

Systems: Terrestrial

Threats (see Appendix for additional information)

The current threats to this species are the degradation of habitat quality due to human activities like agriculture, urbanisation and construction, and recreational cave visitation. However, there are several future potential threats: climatic changes (Ferreira *et al.* 2016) that can change the conditions inside the caves, but also changes in the nearby infrastructures, changes in land use, potential human recreational activities with cave visitation, and geological events (volcanic activity and earthquakes).

Conservation Actions (see Appendix for additional information)

This species is not protected by regional law, but part of its distribution is included in protected areas. The present situation of this species needs to be further assessed and further research is needed into its population, distribution, threats, ecology and life history. 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.

Reviewer(s): Russell, N.

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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(3-4): 603-615.

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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%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.2. Small-holder farming	Ongoing	Majority (50-90%)	Slow, significant declines	Medium impact: 6
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
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 -> 1.2. Ecosystem degradation		
6. Human intrusions & disturbance -> 6.1. Recreational activities	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.2. Species disturbance		
9. Pollution -> 9.3. Agricultural & forestry effluents -> 9.3.3. Herbicides and pesticides	Ongoing	Majority (50-90%)	Rapid declines	Medium impact: 7
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
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		
10. Geological events -> 10.2. Earthquakes/tsunamis	Future	Majority (50-90%)	Rapid declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 1. Ecosystem stresses -> 1.3. Indirect ecosystem effects		
11. Climate change & severe weather -> 11.1. Habitat shifting & alteration	Future	Majority (50-90%)	Slow, significant declines	Low impact: 4
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		

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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
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
4. Education & awareness -> 4.1. Formal education
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 -> 1.2. Population size, distribution & trends
1. Research -> 1.3. Life history & ecology
1. Research -> 1.5. Threats
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): 36
Continuing decline in area of occupancy (AOO): Yes

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Distribution
Extreme fluctuations in area of occupancy (AOO): Unknown
Estimated extent of occurrence (EOO) (km²): 8880
Continuing decline in extent of occurrence (EOO): Yes
Extreme fluctuations in extent of occurrence (EOO): Unknown
Number of Locations: 9
Continuing decline in number of locations: Unknown
Extreme fluctuations in the number of locations: Unknown
Lower elevation limit (m): 5
Upper elevation limit (m): 800
Population
Continuing decline of mature individuals: Unknown
Extreme fluctuations: Unknown
Population severely fragmented: Yes
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Yes

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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.