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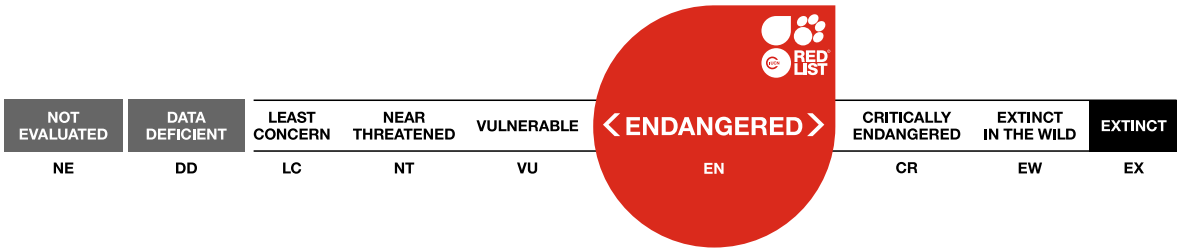
Apamea sphagnicola

Assessment by: Borges, P.A.V.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae

Scientific Name: *Apamea sphagnicola* Wagner, 2014

Assessment Information

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

Year Published: 2021

Date Assessed: March 29, 2018

Justification:

Apamea sphagnicola is an endemic species present on Pico and S. Miguel islands (Azores, Portugal) (Wagner 2014, 2015). It has a small Extent of Occurrence (EOO = 1,958 km²) and small Area of Occupancy (AOO = 16 km²). Currently, *Apamea sphagnicola* is under threat due to degradation of the habitat caused by the invasive plant *Hedychium gardnerianum*, which is changing some of the areas and decreasing the quality of the habitat. The impact of cattle grazing and trampling, touristic activity and large-scale collecting of *Sphagnum* mosses is also decreasing the habitat quality. Based upon the small range, decreasing quality of the habitat and low number of locations, this species is assessed as Endangered (EN).

Geographic Range

Range Description:

Apamea sphagnicola is an Azorean-endemic species present in Pico and S. Miguel islands (Azores, Portugal) with two subspecies: *A. sphagnicola ssp. sphagnicola* from S. Miguel and *A. sphagnicola ssp. centralazorensis* from Pico (Wagner 2014, 2015). It occurs mostly in native forest and the surrounding areas (Wagner 2015), and has been found in the Natural Forest Reserves of Caveiro (Pico) and Pico da Vara (S. Miguel). The Extent of Occurrence (EOO) is *ca*. 1,958 km^2 and the maximum estimated Area of Occupancy (AOO) is 16 km^2.

Country Occurrence:

Native, Extant (resident): Portugal (Azores)

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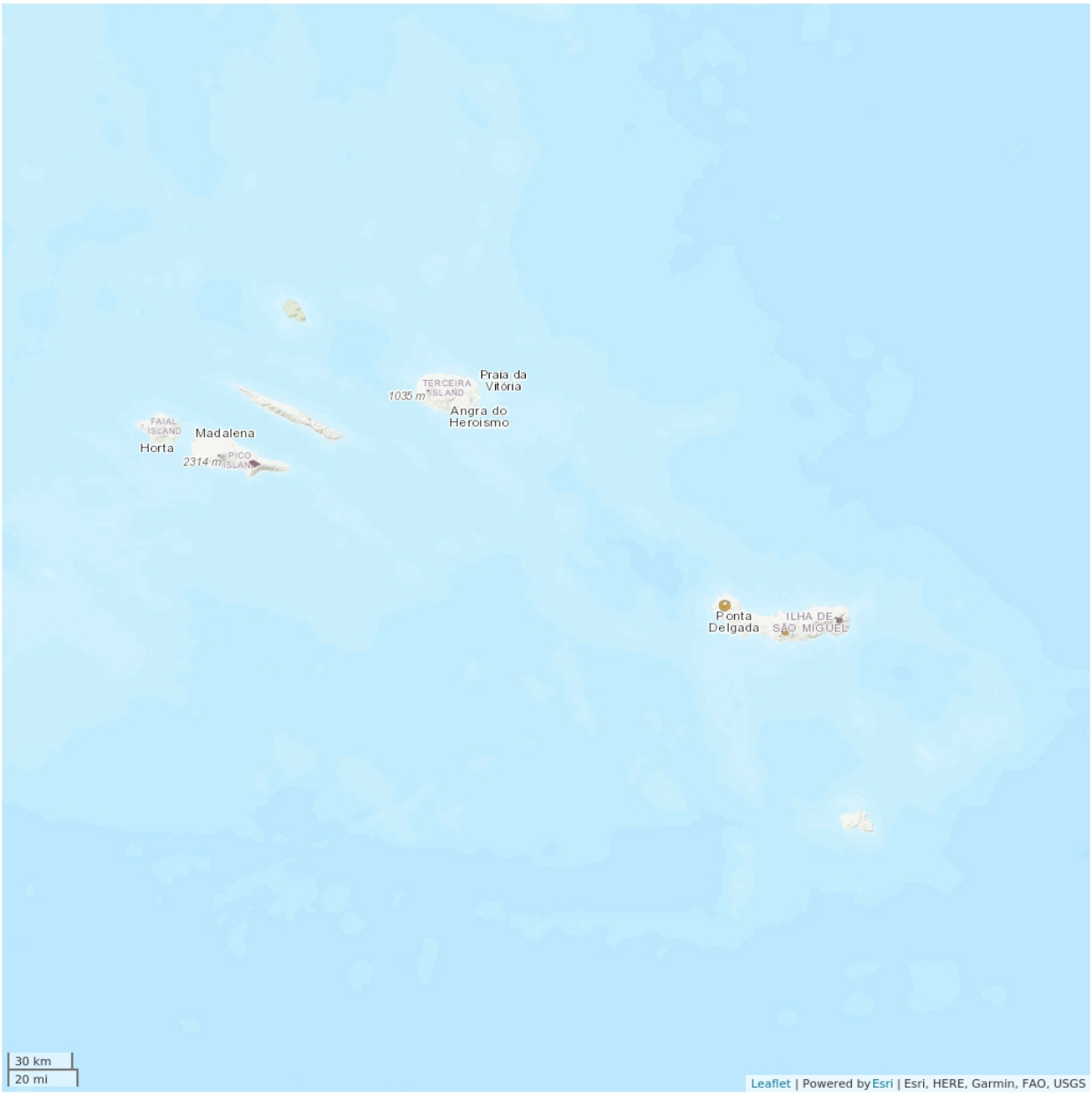
Distribution Map



Legend

- EXTANT (RESIDENT)
- POSSIBLY EXTANT (RESIDENT)

Compiled by:

Azorean Biodiversity Group 2017

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

This species is relatively abundant and occurs mostly in wet highland *Juniperus brevifolia* woodland habitats with *Fetusca francoi* grass and *Sphagnum spp.* moss (Wagner 2014, 2015). A decline is inferred due to the degradation of habitat caused by human activities (agriculture, tourism) and invasions by alien plants. The species has two subpopulations, one in Pico and another in S. Miguel corresponding to two subspecies. Currently, invasive plants, namely *Hedychium gardnerianum*, are changing some of the areas where the species occurs and decreasing the quality of the habitat on both islands. These changes are decreasing the relative cover of endemic plants and changing the soil cover (decreasing the cover of bryophytes and ferns). In addition, Wagner (2015) observed that, on Pico island, cattle are destroying lower embankments of *Sphagnum* through their weight ("cattle erosion") which impacts the species. On S. Miguel, Wagner (2014) observed the impact of cattle (at some of the sites), tourism activity (hiking in sensible parts) and large-scale collecting of *Sphagnum* mosses. Consequently, we assume a decline in number of subpopulations due to such major threats.

Current Population Trend: Decreasing

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

Apamea sphagnicola occurs in wet embankments or steep slopes in open heathland or, more rarely, in open woodland mostly between elevations of 700-900 m (supposedly up to 1,100 m) at S. Miguel (Wagner 2014), and in steep, mainly shady, places with *Sphagnum* mosses on Pico. Primarily, the larvae feed on various mosses (especially *Sphagnum spp.*) and grass tussocks (mainly *Festuca francoi*) (Wagner 2014). Possibly, the larvae are specialized herbivores, and the adults have probably only one generation per year. Wagner (2014) observed larvae in November-December. Adults are active between March and June.

Systems: Terrestrial

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

In the past, the species has probably strongly declined due to changes in habitat size and quality, mostly the creation of pastures (Triantis *et al.* 2010). Currently, invasive plants, namely *Hedychium gardnerianum*, are changing some areas and are decreasing the quality of the habitat. These changes are decreasing the relative cover of endemic plants and changing the soil cover (decreasing the cover of bryophytes and ferns). In addition, Wagner (2015) observed that, on Pico island, cattle are destroying lower embankments with *Sphagnum* through their weight ("cattle erosion"), with associated impacts on this species. In S. Miguel, Wagner (2014) observed the impact of cattle (at some sites), tourism activity (hiking in sensible parts) and large-scale collecting of *Sphagnum* mosses. 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 not protected by regional law, but its habitat is in regionally protected areas (Natural Parks of Pico and S. Miguel). Degraded habitats should be restored and a strategy needs to be developed to address the future threat from climate change. Education and awareness is needed to avoid large-scale collecting of *Sphagnum* mosses. An important first step in creating a potential species-

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specific recovery plan is monitoring the entire invertebrate community of this habitat. Monitoring every ten years using the BALA protocol will inform about habitat quality (see e.g. Gaspar *et al.* 2011). A habitat management plan is also needed, with one anticipated to be developed during the coming years. Further research is needed into its ecology and life history in order to find extant specimens in additional natural forest areas on all Azorean islands and to obtain information on population size, distribution and trends.

Credits

Assessor(s): Borges, P.A.V.

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Contributor(s): Nunes, R.

Authority/Authorities: IUCN SSC Butterfly Specialist Group

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Disclaimer

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?
1. Forest -> 1.4. Forest - Temperate	Resident	Suitable	Yes
3. Shrubland -> 3.4. Shrubland - Temperate	Resident	Suitable	Yes
4. Grassland -> 4.4. Grassland - Temperate	Resident	Suitable	Yes

Threats

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

Threat	Timing	Scope	Severity	Impact Score
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.2. Small-holder grazing, ranching or farming	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. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance		
5. Biological resource use -> 5.2. Gathering terrestrial plants -> 5.2.2. Unintentional effects (species is not the target)	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		
6. Human intrusions & disturbance -> 6.1. Recreational activities	Ongoing	Minority (50%)	Causing/could cause fluctuations	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 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 (Hedychium gardnerianum)	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		
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	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		

Conservation Actions in Place

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

Conservation Action in Place
In-place research and monitoring
Systematic monitoring scheme: Yes
In-place land/water protection
Conservation sites identified: Yes, over entire range
Percentage of population protected by PAs: 61-70
Occurs in at least one protected area: Yes

Conservation Actions Needed

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

Conservation Action 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 -> 4.3. 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
2. Conservation Planning -> 2.1. Species Action/Recovery Plan
2. Conservation Planning -> 2.2. Area-based Management Plan
3. Monitoring -> 3.1. Population trends

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Research Needed
3. Monitoring -> 3.4. Habitat trends

Additional Data Fields

Distribution
Estimated area of occupancy (AOO) (km²): 16
Continuing decline in area of occupancy (AOO): Yes
Extreme fluctuations in area of occupancy (AOO): Unknown
Estimated extent of occurrence (EOO) (km²): 1958
Continuing decline in extent of occurrence (EOO): Yes
Extreme fluctuations in extent of occurrence (EOO): Unknown
Number of Locations: 4
Continuing decline in number of locations: Yes
Extreme fluctuations in the number of locations: Unknown
Lower elevation limit (m): 650
Upper elevation limit (m): 1,100
Population
Continuing decline of mature individuals: Yes
Population severely fragmented: No
No. of subpopulations: 2
Continuing decline in subpopulations: Yes
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Yes
Generation Length (years): 1

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The IUCN Red List Partnership

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