Daubentonia madagascariensis, Aye-aye


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Taxonomy

<table>
<thead>
<tr>
<th>Kingdom</th>
<th>Phylum</th>
<th>Class</th>
<th>Order</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animalia</td>
<td>Chordata</td>
<td>Mammalia</td>
<td>Primates</td>
<td>Daubentoniidae</td>
</tr>
</tbody>
</table>

Scientific Name: *Daubentonia madagascariensis* (Gmelin, 1788)

Synonym(s):
- *Sciurus madagascariensis* Gmelin, 1788

Common Name(s):
- English: Aye-aye

Assessment Information

Red List Category & Criteria: Endangered A2cd+3cd+4cd ver 3.1

Year Published: 2020

Date Assessed: May 7, 2018

Justification:
Listed as Endangered as the species is suspected to have undergone a population decline of ≥50% over a period of 36 years (three generations), due primarily to continuing decline in area, extent and quality of habitat, and exploitation through unsustainable levels of hunting. These causes have not ceased and will to a large extent not be easily reversible. A population reduction of ≥50% over the next 3 generations is also projected due to the same causes. The Aye-aye has been listed on the world’s 25 most endangered primate list from 2016 to 2020 (Randimbiharinarina et al. 2017, 2019).

Previously Published Red List Assessments

2014 – Endangered (EN)
https://dx.doi.org/10.2305/IUCN.UK.2014-1.RLTS.T6302A16114609.en

2008 – Near Threatened (NT)

2000 – Endangered (EN)

1996 – Endangered (EN)

1994 – Endangered (E)

1990 – Endangered (E)

1990 – Endangered (E)

1988 – Endangered (E)

1986 – Endangered (E)

1965 – Unknown (N/A)
Geographic Range

Range Description:
Although mainly reported from eastern, northern and central-western parts of the island, this species evidently occurs in fragmented pockets (though in very low population densities with large individual home ranges) across almost the whole of coastal Madagascar. Recent confirmed direct sightings or feeding traces document its presence in the eastern forests from Montagne des Français in the north-eastern Madagascar to Andohahela National Park (humid parcel only) in the south-western Madagascar and in the western and northern forests from Montagne d'Ambre in northern Madagascar to Tsingy de Bemaraha National Park in the west-central Madagascar. There are also two introduced island populations off the coast of north-eastern Madagascar, one on Nosy Mangabe in the Bay of Antongil, and the other on île Roger (a.k.a. "Aye-aye Island") at the edge of the town of Mananara-Nord (although there are reports that they have been extirpated on this island; S. Lhota, pers. comm.). Whether the species formerly existed on the island of Nosy Mangabe remains uncertain, but subsequent expeditions have confirmed its continued survival there since its mid-1960s after the introduction of nine individuals. This species occurs from sea-level to high mountain elevations. It has been estimated that there will be a 43% reduction in the species' range from 2000 to 2080 due to climate change (Brown and Yoder 2015). This species is likely affected by national trends in forest habitat loss: Madagascar lost 37% of its forest cover from 1973 to 2014, with an annual deforestation rate of 1.1%/year from 2010 to 2014. Almost half of Madagascar's forest (46%) is now located within less than 100 metres from the forest edge (Vieilledent et al. 2018).

Country Occurrence:
Native, Extant (resident): Madagascar
Population

Based solely from feeding trace signs and rare direct sightings, the species is known to occur in many different habitat types and regions as described under the geographic range section. Population numbers are certainly in decline due to habitat loss and hunting. However, there is little understanding of population size and dynamics due to its secretive nocturnal behavior. *Daubentonia madagascariensis* is suspected to have the lowest genetic diversity of all the lemur taxa (Perry *et al.* 2012, Kistler *et al.* 2015). Additionally, Perry *et al.* 2013 documented an important centre of endemism in the northern Madagascar for the aye-aye which represents an area of high diversity and high habitat loss. Furthermore, recent studies have documented large individual home ranges and varying habitat uses by this species which impacts management strategies (Andriamisedra *et al.* 2015, Thompson *et al.* 2016, Sefczek *et al.* 2017, 2018a,b, 2019, Randimbiharinirina *et al.* 2018).

This species is suspected to have undergone a population decline of ≥50% over a period of 36 years (three generations), due primarily to continuing decline in area, extent and quality of habitat, and exploitation through unsustainable levels of hunting. These causes have not ceased and will to a large extent not be easily reversible. A population reduction of ≥50% over the next 3 generations is also projected due to the same causes. The Aye-aye has been listed on the world’s 25 most endangered primate list from 2016 to 2020 (Randimbiharinirina *et al.* 2017, 2019).

In the future, it has been estimated that there will be a 43% reduction in the species’ range from 2000 to 2080 due to climate change (Brown and Yoder 2015).

**Current Population Trend:** Decreasing

Habitat and Ecology (see Appendix for additional information)

Direct sightings of *Daubentonia madagascariensis* are rare; its presence is often assumed from tree hole marks or feeding trace. Abundance is also hard to estimate, as one individual can make numerous feeding traces in search of insect grubs in dead and live wood trees and bamboo (Randimbiharinirina *et al.* 2017, Sefczek *et al.* 2017, 2019). Furthermore, the nocturnal Aye-aye is quite adaptable and is known from a variety of habitats including primary rain forest, deciduous forest, secondary growth, dry scrub forest, and mangrove swamps. The species has also been noted to occur in cultivated areas, which are considered marginal, unsuitable, habitats. However, these plantations can support multiple individuals if there is adjacent endemic forest as well (Randimbiharinirina *et al.* 2017). The southern spiny desert appears to be the only habitat in which the species does not occur. Its presence in many areas appears to be determined largely by its primary food resource, the seeds of ramy (*Canarium* spp.) although there are also other dietary staples (Randimbiharinirina *et al.* 2017). During the day, *D. madagascariensis* sleeps in nests, tree forks or vine tangles. Nests may be occupied for a few days at a time and several individuals may use the same nest at different times (usually a female with a dependent offspring).

*Daubentonia madagascariensis* has vast home ranges which exceed 600 ha; interestingly, individuals appear to spend more time moving along the ground than any other lemur except *Lemur catta* (Sterling 1993). Recent evidence suggests that Aye-ayes are not strictly solitary, but also forage in tandem and may exhibit differing relationships between animals of the same sex (Sterling and Richard 1995). Aye-ayes appear to have no restricted mating season (i.e. non-seasonal). A single offspring is born which is
nurtured for 18 – 24 months before it is weaned. Females begin breeding at three or four years, and indications are that females give birth every two to three years (Petter and Peyrieras 1970, E. E. Louis, Jr. pers. comm.).

**Systems:** Terrestrial

**Use and Trade**

This species is hunted for food (and is killed in some areas as a harbinger of evil and as a crop-pest). There may also be exports of this species occurring on a small scale (R. Dolch pers. comm.).

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

Habitat destruction is the primary threat for aye-aye throughout their range, with trees such as *Intsia bijuga* and *Canarium madagascariensis* – dietary staples for the species – being cut preferentially for the construction of boats, houses, and coffins (Iwano and Iwakawa 1988). As this species subsist primarily as signal individuals with enormous home territories, loss of habitat is primary threat. These animals are killed in some areas as a harbinger of evil/symbol of bad luck and as a crop-pest (e.g. coconuts), as well as hunted for food (only known from certain parts of Makira (C. Golden pers. comm.). Issues surrounding local taboos or *fady* vary from region to region.

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

This species is listed on Appendix I of CITES. *Daubentonia madagascariensis* is reported to occur in numerous protected areas, including 13 national parks (Andohahela, Anringitra, Mananara-Nord, Mantadia, Marojejy, Masoala, Midongy du Sud, Montagne d’Ambre, Ranomafana, Sahamalaza-Iles Radama, Tsingy de Bemaraha, Tsingy de Namoroka, and Zahamena), seven strict nature reserves (Betampona, Tsaratanana, Makira, Farankaraina, Itampolo, Tsingy de Bemaraha, and Zahamena), and 14 special reserves (Ambatovakya, Analamazaotra, Analamerana, Anjanaharibe-Sud, Ankarana, Bora, Beanka, Forêt d’Ambre, Kalambatritra, Manombo, Manongarivo, Marotandrano, Nosy Mangabe, and Pic d’Ivohibe). They are found as well in the forests of Daraina (part of the Loky-Manambato Protected Area), as well as in the Maroala and Anjiamanginana Protected Forest, Kianjavato (part of the CO-FAV), Montagne des Français Protected Area and Torotorofotsy Ramsar Site. Yet despite occurring in a great many protected areas, their presence is often based only on signs and infrequent sightings, so there is little understanding of population size and dynamics until recently (review included citations). However, there is an urgent need for a systematic census of this important flagship species throughout its range, with the ultimate objective of developing a conservation action plan for the species. As of 2019, there were approximately 50 aye-ayes in various zoological collections worldwide (ZIMS 2019). There is a captive breeding programme involving various institutions, and an EEP and a SSP. This species has not successfully bred in second generation in captivity. Furthermore, due to their secretive lifestyle in the forest canopy without being directly observed, any ability to recognize crisis situation involving this species will most likely only noted after they have been extirpated from a location. Further efforts using molecular techniques to determine genetic health parameters and population dynamics and densities need to be pursued (Aylward *et al.* 2018).

**Credits**


https://dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T6302A115560793.en
Bibliography


Citation


https://dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T6302A115560793.en
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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)

<table>
<thead>
<tr>
<th>Habitat</th>
<th>Season</th>
<th>Suitability</th>
<th>Major Importance?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Forest -&gt; 1.5. Forest - Subtropical/Tropical Dry</td>
<td>Resident</td>
<td>Suitable</td>
<td>Yes</td>
</tr>
<tr>
<td>1. Forest -&gt; 1.6. Forest - Subtropical/Tropical Moist Lowland</td>
<td>Resident</td>
<td>Suitable</td>
<td>Yes</td>
</tr>
<tr>
<td>1. Forest -&gt; 1.7. Forest - Subtropical/Tropical Mangrove Vegetation Above High Tide Level</td>
<td>Resident</td>
<td>Suitable</td>
<td>Yes</td>
</tr>
<tr>
<td>1. Forest -&gt; 1.9. Forest - Subtropical/Tropical Moist Montane</td>
<td>Resident</td>
<td>Suitable</td>
<td>Yes</td>
</tr>
<tr>
<td>3. Shrubland -&gt; 3.5. Shrubland - Subtropical/Tropical Dry</td>
<td>Resident</td>
<td>Suitable</td>
<td>Yes</td>
</tr>
<tr>
<td>14. Artificial/Terrestrial -&gt; 14.3. Artificial/Terrestrial - Plantations</td>
<td>Resident</td>
<td>Marginal</td>
<td>-</td>
</tr>
<tr>
<td>14. Artificial/Terrestrial -&gt; 14.4. Artificial/Terrestrial - Rural Gardens</td>
<td>Resident</td>
<td>Marginal</td>
<td>-</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>End Use</th>
<th>Local</th>
<th>National</th>
<th>International</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pets/display animals, horticulture</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Food - human</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Threat</th>
<th>Timing</th>
<th>Scope</th>
<th>Severity</th>
<th>Impact Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stresses:</td>
<td></td>
<td>1. Ecosystem stresses -&gt; 1.1. Ecosystem conversion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Ecosystem stresses -&gt; 1.2. Ecosystem degradation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Biological resource use -&gt; 5.1. Hunting &amp; trapping terrestrial animals -&gt; 5.1.1. Intentional use (species is the target)</td>
<td>Ongoing</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stresses:</td>
<td></td>
<td>2. Species Stresses -&gt; 2.1. Species mortality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Biological resource use -&gt; 5.1. Hunting &amp; trapping terrestrial animals -&gt; 5.1.3. Persecution/control</td>
<td>Ongoing</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stresses:</td>
<td></td>
<td>2. Species Stresses -&gt; 2.1. Species mortality</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Conservation Actions in Place

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

Conservation Action in Place

In-place land/water protection

Conservation sites identified: Yes, over entire range

Occurs in at least one protected area: Yes

In-place education

Included in international legislation: Yes

Subject to any international management / trade controls: Yes

Conservation Actions Needed

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

Conservation Action Needed

2. Land/water management -> 2.1. Site/area management

4. Education & awareness -> 4.2. Training

Research Needed

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

Research Needed

1. Research -> 1.1. Taxonomy

1. Research -> 1.2. Population size, distribution & trends


Additional Data Fields
### Distribution

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Estimated extent of occurrence (EOO) (km$^2$):</td>
<td>523499</td>
</tr>
<tr>
<td>Continuing decline in extent of occurrence (EOO):</td>
<td>Yes</td>
</tr>
<tr>
<td>Lower elevation limit (m):</td>
<td>10</td>
</tr>
<tr>
<td>Upper elevation limit (m):</td>
<td>1,875</td>
</tr>
</tbody>
</table>

### Population

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Population severely fragmented:</td>
<td>Yes</td>
</tr>
<tr>
<td>Continuing decline in subpopulations:</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Habitats and Ecology

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuing decline in area, extent and/or quality of habitat:</td>
<td>Yes</td>
</tr>
<tr>
<td>Generation Length (years):</td>
<td>12</td>
</tr>
</tbody>
</table>
The IUCN Red List Partnership

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