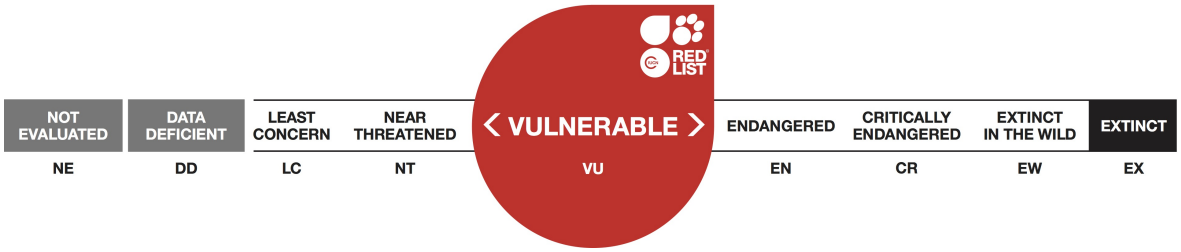
The IUCN Red List of Threatened Species™
ISSN 2307-8235 (online)
IUCN 2008: T8668A45197868

Fossa fossana, Spotted Fanaloka

Assessment by: Hawkins, F.



View on www.iucnredlist.org

Citation: Hawkins, F. 2015. *Fossa fossana. The IUCN Red List of Threatened Species 2015*: e.T8668A45197868. http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T8668A45197868.en

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Mammalia	Carnivora	Eupleridae

Taxon Name: *Fossa fossana* (P.L.S. Müller, 1776)

Synonym(s):

- *Viverra fossa*

Common Name(s):

- English: Spotted Fanaloka, Fanaloka, Malagasy Civet
- French: Civette Fossane, Civette Malgache, Fossane
- Spanish: Cibeta de Madagascar

Assessment Information

Red List Category & Criteria: Vulnerable A3cde+4cde ver 3.1

Year Published: 2015

Date Assessed: March 2, 2015

Justification:

Spotted Fanaloka is listed as Vulnerable because it is likely that over the course of the next three generations (taken as 22 years), the population will drop by more than 30% (and possibly much more) mainly because of widespread habitat loss, hunting, persecution, and the effects of introduced carnivores. The rates of habitat loss and hunting have recently increased significantly because of breakdown of governance since the coup d'etat in 2009, leading to increased artisanal mining in forest areas, increased hunting, and increased opportunistic rosewood cutting throughout the species' range.

Previously Published Red List Assessments

2008 – Near Threatened (NT) – http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T8668A12925675.en

2000 – Vulnerable (VU)

1996 – Vulnerable (VU)

1994 – Vulnerable (V)

1990 – Vulnerable (V)

1988 – Vulnerable (V)

1986 – Insufficiently Known (K)

Geographic Range

Range Description:

http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T8668A45197868.en

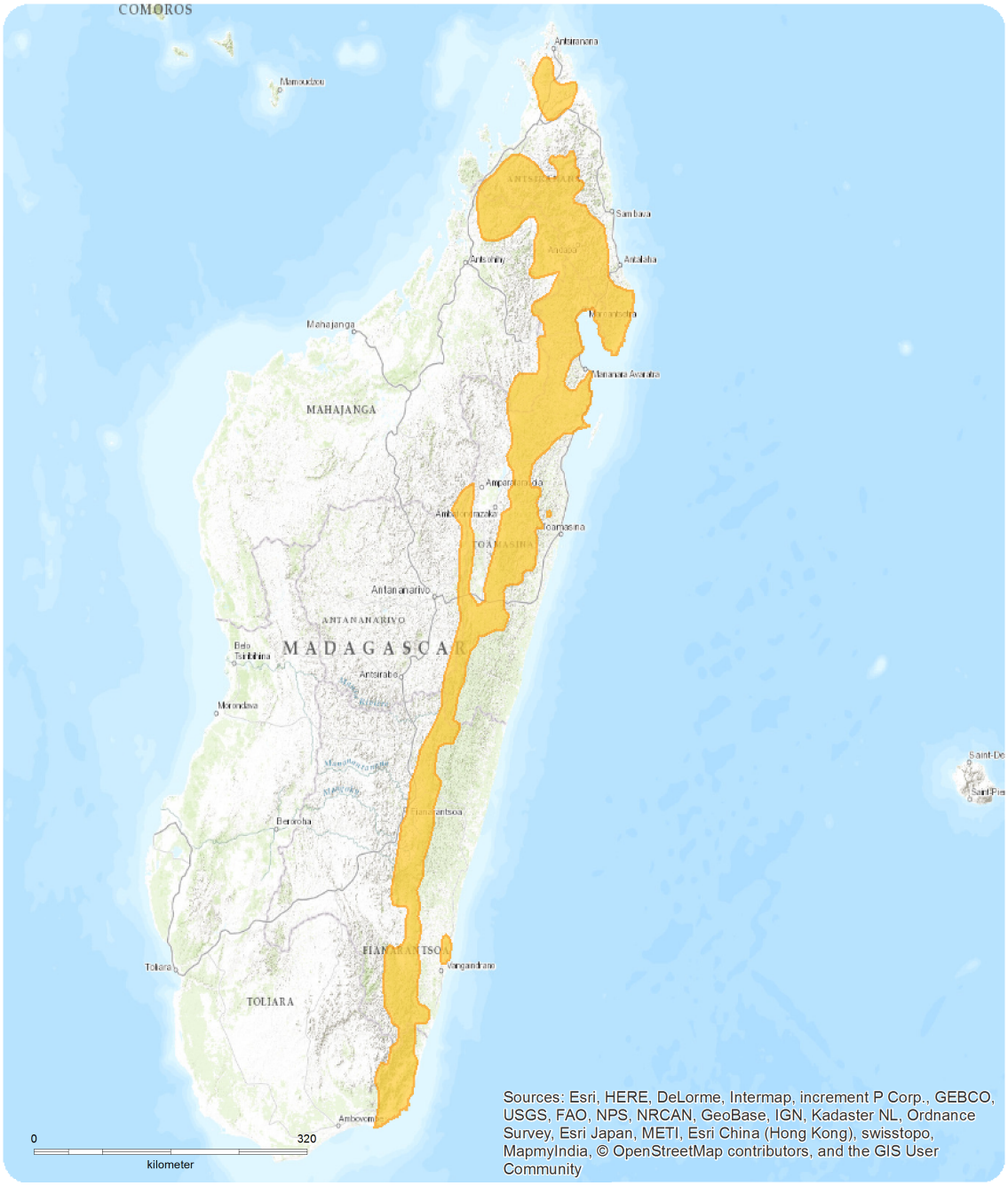
Spotted Fanaloka is endemic to the eastern forests of Madagascar and the Sambirano region in the island's north-west (Kerridge *et al*. 2003). It is present as far north as Montagne d'Ambre National Park and as far south as Andohahela National Park in the south-east. Strongholds include the Masoala Peninsula, rainforests at Mananara, Ambatovaky and Zahamena, and the Andohahela forest region. The altitudinal range is sea level to at least 1,600 m, but the species seems to be much scarcer above 1,000 m (Goodman 2012).

Country Occurrence:

Native: Madagascar

http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T8668A45197868.en

Distribution Map



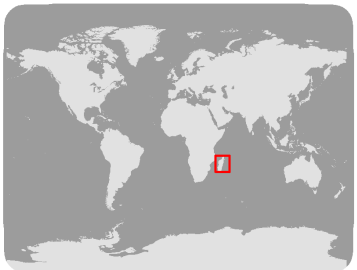
Fossa fossana

Range

Extant (resident)

Compiled by:
IUCN (International Union for Conservation of Nature)

NE DD LC **NT** NEAR THREATENED VU EN CR EW EX



The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.

http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T8668A45197868.en

Population

Kerridge *et al*. (2003) trapped 22 individuals in two weeks in a 2 km² area near Vevembe, indicating that the density of the species can be high in favoured habitat. Around Ranomafana National Park, Gerber *et al*. (2012) found that Spotted Fanaloka occurred at lower density (1.38 ± SE 0.22 individuals per km²) in logged forest than in unlogged (3.19 ± SE 0.55) and it was absent from forest fragments over 2.5 km from intact forest.

In north-east Madagascar, camera-trap surveys (Farris *et al*. in review a, Z. Farris pers. comm. 2014) revealed a high probability of occupancy of 0.70 (SE ± 0.07) across the Masoala-Makira landscape, the highest of any native carnivore. However, Spotted Fanaloka probability of occupancy (defined as the probability that a site/forest is occupied by the species of interest while taking into account the variation in detectability of the species across the various sites) was significantly higher in non-degraded forest (0.73 ± SE 0.08) than in degraded forest (0.50 ± SE 0.08). Spotted Fanaloka was not detected in forest fragments 5 km or more from contiguous forests (Farris and Kelly 2011, Farris *et al*. in review a). Spotted Fanaloka is constrained by the presence of both exotic feral/wild cats (*Felis* spp.) and exotic Small Indian Civets (*Viverricula indica*) (Gerber *et al*. 2012, Farris *et al*. in review a). Photographic surveys over a six-year period (2008-2013) and resulting multi-season occupancy analyses at one contiguous forest site showed that Spotted Fanaloka occupancy decreased from 1.0 (2008) to 0.80 (2013) (trap success decreased from 14.0 in 2008 to 3.59 in 2013) which resulted in a moderate probability of local extirpation of 0.14 (0.05), while at another survey site trap success changed only from 5.04 in 2011 to 4.46 in 2013 (Z. Farris pers. comm. 2014).

Current Population Trend: Decreasing

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

This nocturnal and terrestrial species is found in humid tropical lowland, mid-altitude and littoral forests, and is sometimes associated with streams or marshy areas in these habitats; it seems not to adapt to secondary habitats (Kerridge *et al*. 2003).

There is a lower probability of occupancy and significantly lower encounter rate in degraded forest sites than in intact ones. Further, there is a negative association with proximity to villages (Farris and Kelly 2011, Farris *et al*. 2012, Farris *et al*. in review a).

Spotted Fanaloka is almost exclusively solitary; however, an adult and juvenile were photographed travelling together in March. Camera-trapping revealed Spotted Fanaloka to be nocturnal, with a few records of daylight activity. Spotted Fanaloka shifts peak activity from cool season to hot season, but this might have resulted from increased human and dog activity (Farris *et al*. in review b).

During the daytime, animals shelter in hollow trees, under fallen logs, or amongst rocks. The gestation period is around 82-89 days (Albignac 1973). Young are born well developed, and sexual maturity is attained at about two years of age.

Systems: Terrestrial

Use and Trade

The species is known to be hunted for food (see Threats section for more information).

Threats (see Appendix for additional information)

Being rather constrained to primary forest and absent from forest fragments (Gerber *et al*. 2012), Spotted Fanaloka is threatened by deforestation for cultivated land, and by forest degradation through selective logging and charcoal production. It is also threatened by hunting; its taste is the most preferred among the native carnivores (Golden 2005). Introduced species including dogs, cats, and the Small Indian Civet (*Viverricula indica*) are competitors, and dogs are also likely to be predators.

Deforestation and forest disturbance across the range of Spotted Fanaloka has increased significantly since 2009. R. Rajaonson (pers. comm. 2014) estimates that deforestation in eastern forest increased from 0.5% per annum in 2005-2010 to 0.94% per annum in 2010-2013. Allnut *et al*. (2009) estimated that in Masoala National Park, annual rates of deforestation in the study area increased to 1.27% per annum in 2011. High levels of illegal settlement in protected areas, especially around the Bay of Antongil, are linked to artisanal mining (for quartz) and logging of rosewood; hunting for food using dogs has increased greatly in these areas as a result. Some villages have seen increases in populations of between 200 and 300% (C. Golden pers. comm. 2014).

Household interviews conducted by Madagasikara Voakajy (pers. comm. 2014) in the Moramanga region of eastern Madagascar in 2008-2009 suggested that 513 (31%) of 1,635 respondents interviewed in 129 villages had eaten Spotted Fanaloka in the preceding year. This is the highest rate among all the local endemic carnivores. By contrast, in Makira, hunting, including for food, appears to be less of a concern for Spotted Fanaloka than for other carnivores across the Makira landscape. Only 11 were reportedly consumed in household surveys within four villages (143 households were surveyed) from 2005 to 2011 near the Makira Natural Park. However, hunting rates were still positively associated with Spotted Fanaloka occupancy, demonstrating increased efforts in non-degraded forest where its abundance/activity is highest (Farris *et al*. in review a).

Spotted Fanaloka appears to alter its temporal activity when human and dog activity are very high. It has strong temporal overlap with Small Indian Civet, revealing the potential for increased interactions and competition (Farris *et al*. in review b).

Single-season landscape occupancy analyses showed that Spotted Fanaloka probability of occupancy decreases dramatically when feral cat and Small Indian Civet were present (Farris *et al*. in review a).

Conservation Actions (see Appendix for additional information)

Spotted Fanaloka is listed on Appendix II of CITES. It inhabits a number of protected areas, including Montagne d'Ambre, Masoala, Marojejy, Zahamena, Ranomafana and Andohahela National Parks, and Ankarana Special Reserve.

Credits

Assessor(s): Hawkins, F.

Reviewer(s): Duckworth, J.W.

http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T8668A45197868.en

Contributor(s): Golden, C., Farris, Z.J., Jenkins, R.K.B. & Jones, J.P.G.

Bibliography

Albignac, R. 1972. The carnivora of Madagascar. In: R. Battistini and G. Richard-Vindard (eds), *Biogeography and ecology in Madagascar*, pp. 667-682. W. Junk, The Hague.

Albignac, R. 1973. Mammiferes carnivores. Faune de Madagascar. ORSTOM/CNRS, Paris, France.

Allnut, T.F., Asner, G.P., Golden, C.D. and Powell, G.V.N. 2013. Mapping recent deforestation and disturbance in northeastern Madagascar. *Tropical Conservation Science* 6: 1-15.

Farris Z.J. and Kelly, M.J. 2011. A preliminary assessment of carnivores across the Makira Protected Area, Madagascar: results from a WCS pilot camera study. Wildlife Conservation Society, Antananarivo, Madagascar.

Farris, Z.J., Gerber, B., Kelly, M.J., Karpanty, S., Murphy, F. and Andrianjakarivelo, V. in review b. When the carnivores roam: temporal patterns and partitioning among Madagascar's native and exotic carnivores.

Farris, Z.J., Golden, C., Karpanty, S., Murphy, A., Stauffer, D., Andrianjakarivelo, V., Ratelolahy, F., Holmes, C. and Kelly, M.J. in review a. Effects of poaching, micro-habitat and landscape variables, human encroachment, and exotic species on Madagascar's endemic and exotic carnivore community across the Masoala-Makira landscape.

Farris Z.J., Kelly M., Karpanty S.M., Ratelolahy F., Andrianjakarivelo V. and Holmes C. 2012. Brown-tailed Vontsira *Salanoia concolor* (Eupleridae) documented in Makira Natural Park, Madagascar: new insights on distribution and camera-trap success. *Small Carnivore Conservation* 47: 82–86.

Garbutt, N. 1999. *Mammals of Madagascar*. Pica Press, East Sussex, UK.

Gerber, B.D., Karpanty, S.M. and Randrianantenaina, J. 2012. The impact of forest logging and fragmentation on carnivore species composition, density and occupancy in Madagascar's rainforests. *Oryx* 46: 414-422.

Goodman, S. 2012. *Les Carnivora de Madagascar*. Association Vahatra, Antananarivo, Madagascar.

IUCN. 2015. The IUCN Red List of Threatened Species. Version 2015-4. Available at: www.iucnredlist.org. (Accessed: 19 November 2015).

Kerridge, F.J., Ralisoamalala, R.C., Goodman, S.M. and Pasnick, S.D. 2003. *Fossa fossana*, Malagasy Striped Civet, Fanaloka. In: S.M. Goodman and J.P. Benstead (eds), *The Natural History of Madagascar*, pp. 1363-1365. The University of Chicago Press, Chicago, USA and London, UK.

Pacifici, M., Santini, L., Di Marco, M., Baisero, D., Francucci, L., Grottolo Marasini, G., Visconti, P. and Rondinini, C. 2013. Generation length for mammals. *Nature Conservation* 5: 87–94.

Perschke, M. 1996. Mongooses in the Tsimbazaza Zoo and the Ranomafana National Park, Madagascar. *Small Carnivore Conservation* 14: 1.

Schreiber, A., Wirth, R., Riffel, M. and Van Rompaey, H. 1989. *Weasels, civets, mongooses, and their relatives. An Action Plan for the conservation of mustelids and viverrids*. IUCN, Gland, Switzerland.

Citation

Hawkins, F. 2015. *Fossa fossana. The IUCN Red List of Threatened Species 2015*: e.T8668A45197868. http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T8668A45197868.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.

http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T8668A45197868.en

Appendix

Habitats

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

Habitat	Season	Suitability	Major Importance?
1. Forest -> 1.5. Forest - Subtropical/Tropical Dry	-	Suitable	-
1. Forest -> 1.6. Forest - Subtropical/Tropical Moist Lowland	-	Suitable	-
1. Forest -> 1.9. Forest - Subtropical/Tropical Moist Montane	-	Suitable	-

Threats

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

Threat	Timing	Scope	Severity	Impact Score
2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.1. Shifting agriculture	Ongoing	Majority (50-90%)	Slow, significant declines	Medium impact: 6
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
5. Biological resource use -> 5.1. Hunting & trapping terrestrial animals -> 5.1.1. Intentional use (species is the target)	Ongoing	Majority (50-90%)	Slow, significant declines	Medium impact: 6
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.3. Logging & wood harvesting -> 5.3.5. Motivation Unknown/Unrecorded	Ongoing	Majority (50-90%)	Slow, significant declines	Medium impact: 6
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
8. Invasive & other problematic species & genes -> 8.1. Invasive non-native/alien species -> 8.1.2. Named species (Viverricula indica)	Ongoing	Majority (50-90%)	Slow, significant declines	Medium impact: 6
	Stresses:	2. Species Stresses -> 2.3. Indirect species effects -> 2.3.2. Competition		
8. Invasive & other problematic species & genes -> 8.1. Invasive non-native/alien species -> 8.1.2. Named species (Felis catus)	Ongoing	Majority (50-90%)	Slow, significant declines	Medium impact: 6
	Stresses:	2. Species Stresses -> 2.3. Indirect species effects -> 2.3.2. Competition		
8. Invasive & other problematic species & genes -> 8.1. Invasive non-native/alien species -> 8.1.2. Named species (Canis familiaris)	Ongoing	Majority (50-90%)	Slow, significant declines	Medium impact: 6
	Stresses:	2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.3. Indirect species effects -> 2.3.2. Competition		

Conservation Actions in Place

http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T8668A45197868.en

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

Conservation Actions in Place
In-Place Land/Water Protection and Management
Occur in at least one PA: 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 Actions Needed
2. Land/water management -> 2.1. Site/area management

Research Needed

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

Research Needed
3. Monitoring -> 3.1. Population trends

Additional Data Fields

Distribution
Continuing decline in area of occupancy (AOO): Yes
Extreme fluctuations in area of occupancy (AOO): No
Continuing decline in extent of occurrence (EOO): Unknown
Extreme fluctuations in extent of occurrence (EOO): No
Continuing decline in number of locations: Yes
Extreme fluctuations in the number of locations: No
Lower elevation limit (m): 0
Upper elevation limit (m): 1600
Population
Continuing decline of mature individuals: Yes
Extreme fluctuations: No
Population severely fragmented: No

http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T8668A45197868.en

Population
Extreme fluctuations in subpopulations: No
All individuals in one subpopulation: No
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Yes
Generation Length (years): 7.6

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: BirdLife International; Botanic Gardens Conservation International; Conservation International; Microsoft; NatureServe; Royal Botanic Gardens, Kew; Sapienza University of Rome; Texas A&M University; Wildscreen; and Zoological Society of London.