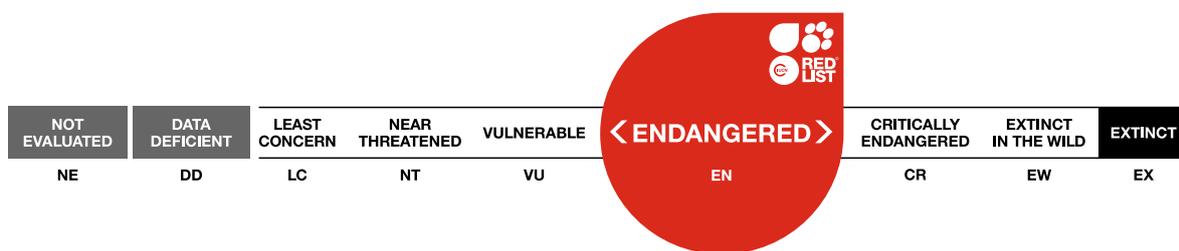




Chlorocebus djamdjamensis ssp. harenaensis, Bale Mountains monkey

Assessment by: Butynski, T.M., Mekonnen, A. & De Jong, Y.A.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Mammalia	Primates	Cercopithecidae

Scientific Name: *Chlorocebus djamdjamensis ssp. harenaensis* Gippoliti, 2020

Parent Species: See [Chlorocebus djamdjamensis](#)

Common Name(s):

- English: Bale Mountains monkey

Taxonomic Notes:

Due to ongoing hybridization in contact zones among various *Chlorocebus* taxa in Ethiopia (Haus 2013, Haus *et al.* 2013b), *Chlorocebus* taxonomy in Ethiopia is under debate. *Chlorocebus djamdjamensis* was long considered to be monotypic. The taxonomic history of *C. djamdjamensis* is reviewed in Butynski *et al.* (2013). Kingdon (1997) suggests hybridization between *C. djamdjamensis* and other species of *Chlorocebus*. Mekonnen *et al.* (2012) indicate hybridization between *C. djamdjamensis* and grivet *C. aethiops* based on the colouration of their pelage. Haus (2013) and Haus *et al.* (2013a,b) confirm ongoing hybridization between *C. djamdjamensis* and *C. aethiops* based on molecular evidence. Those authors indicate the possibility that the holotype of *djamdjamensis* (close to Bubbe Kersa and Gossa in Gujji) represents a hybrid between *C. djamdjamensis* and *C. aethiops*, and that hybridization is not only on-going but had been occurring for more than 100 years.

Mekonnen *et al.* (2018c) conducted a study on mitochondrial DNA sequences and suggested that there are two distinct clusters within *C. djamdjamensis*; one in the Bale Mountains and one in the Sidamo Highlands, both in central southern Ethiopia. Those authors confirmed hybridization with *C. aethiops* but also reported one phenotypic *C. djamdjamensis* x vervet *C. pygerythrus* hybrid. Mekonnen *et al.* (2018c) indicate that gene flow between *C. djamdjamensis* in the Bale Mountains and in the Sidamo Highlands is uncommon. In 2020, Gippoliti proposed the name '*Chlorocebus djamdjamensis harenaensis*' for the form in the Harena Forest of Bale Mountains. Since the Bale Mountains and Sidamo Highland populations exhibit strong genetic differentiation (Mekonnen *et al.* 2018c), and differ in the coloration of the pelage (Gippoliti 2020, Mekonnen *et al.* 2012), ecology, behaviour (Mekonnen *et al.* 2017, 2018a,b), and the gut microbiota (Trosvik *et al.* 2018), we acknowledge two *C. djamdjamensis* subspecies: *djamdjamensis* and *harenaensis*. Additional studies on the phylogenetics and evolutionary history of *C. djamdjamensis* are required, as well as on the phenotypic, morphological, and genetic diversity present within this species.

Assessment Information

Red List Category & Criteria: Endangered B1ab(i,iii,v) [ver 3.1](#)

Year Published: 2022

Date Assessed: February 27, 2022

Justification:

Chlorocebus djamdjamensis harenaensis is listed as Endangered. This subspecies, endemic to Ethiopia, has a small area of occupancy (ca 2,600 km²) and extent of occurrence (ca 4,105 km²). The western limit of the range is poorly known. The current population size is unknown. Densities are generally low. Habitat loss, degradation, and fragmentation, due to the activities of a dense and rapid growing human population, are threatening the long-term survival of this subspecies. The uncontrolled harvest of bamboo *Arundinaria alpina* for commercial purposes and local consumption is a major threat to this bamboo forest specialist (Mekonnen *et al.* 2022). The threats are severe and ongoing. A field survey is urgently needed to better determine geographic distribution, abundance, threats, and priorities for long-term conservation.

Geographic Range

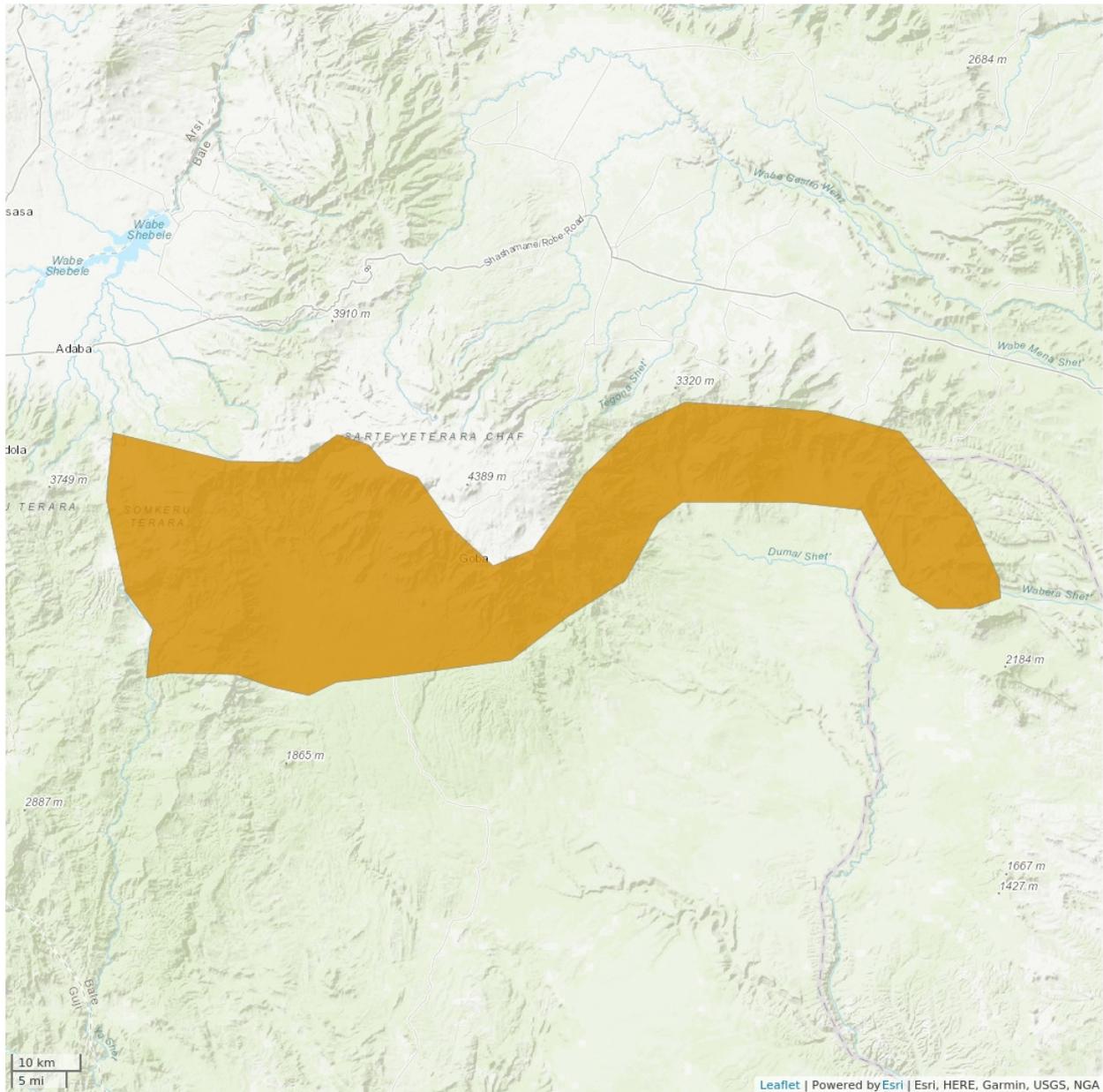
Range Description:

Chlorocebus djamdjamensis harenaensis is endemic to the Bale Mountains of central southern Ethiopia, east of the Eastern (Gregory) Rift Valley (Mekonnen *et al.* 2018c). The western extent of its geographic range is not known. The observed altitudinal range is 2,315–3,250 m asl (Mekonnen *et al.* 2010b, Wakjira *et al.* 2011). *Chlorocebus d. harenaensis* has an Area of Occupancy of ca 2,600 km² and an extent of occurrence (EOO) of ca 4,105 km².

Country Occurrence:

Native, Extant (resident): Ethiopia

Distribution Map



Legend

EXTANT (RESIDENT)

Compiled by:

IUCN (International Union for Conservation of Nature) 2022



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

Population

Current population size is not known, though it is assumed that populations are declining due to habitat degradation and other threats. Odobullu Forest and Harena Forest are the strong-holds for this subspecies. Densities are generally low. The only locality with a known population size is Odobullu Forest (1,700–2,000 individuals; Mekonnen *et al.* 2010b). About 1,437 individuals occurred in Harena Forest in 2007 at a density of 9.6 individuals/km² (Wakjira *et al.* 2011).

Current Population Trend: Decreasing

Habitat and Ecology (see Appendix for additional information)

Chlorocebus d. harenaensis is a bamboo-eating (*Arundinaria alpina*), diurnal primate (Mekonnen *et al.* 2010a, 2018b, 2021). During the day-light hours, this monkey spends only about 2% of the time on the ground (Mekonnen *et al.* 2018b). As an arboreal bamboo specialist, *C. d. harenaensis* is unique within *Chlorocebus* as all other taxa are semi-terrestrial generalists. *Chlorocebus d. harenaensis* lives in the bamboo forest zone of the Bale Mountains. Diet in Odobullu Forest is dominated by bamboo young leaves (61%), followed by bamboo shoots (19%) and various fruits (6%) and flowers (5%). The remainder consists of invertebrates, stems, mature leaves, and roots (Mekonnen *et al.* 2018a). Bamboo accounts for up to 81% of the diet (Mekonnen *et al.* 2010a, 2018a).

In Odobullu Forest, mean daily travel of two groups was 928 m (Mekonnen *et al.* 2010a) and mean home range size was 21 ha (Mekonnen *et al.* 2017).

Besides humans, potential predators include leopards (*Panthera pardus*), lions (*Panthera leo*), spotted hyaena (*Crocuta crocuta*), and large birds of prey (Mekonnen *et al.* 2022). This taxa often forms polyspecific associations with black-and-white colobus monkeys (*Colobus guereza*) (Mekonnen *et al.* 2016). It is parapatric with *C. pygerythrus*, which occupies the lower altitude regions north and south of *C. d. harenaensis*' range. Sympatry between these two taxa has not been reported (Mekonnen *et al.* 2018c).

Mekonnen *et al.* (2010a,b; 2017; 2016; 2018a,c), Mekonen *et al.* (2017), and Butynski *et al.* (2013) summarise the current state of knowledge of this diurnal monkey.

Systems: Terrestrial

Use and Trade (see Appendix for additional information)

This species is persecuted for crop raiding.

Threats (see Appendix for additional information)

Chlorocebus d. harenaensis is threatened by forest loss, degradation, and fragmentation, as well as fire, expansion of agriculture and human settlements, livestock grazing, and the removal of forest products such as bamboo, lumber, fuelwood, and charcoal. In particular, the unsustainable harvest of bamboo for commercial purposes and local consumption is a threat for this specialized monkey (Mekonnen *et al.* 2022).

Chlorocebus d. harenaensis in the Odobullu Forest is surrounded by tree-dominated forest. Here there is no monkey-human conflict. In the Harena Forest and Wogie area, however, this monkey is in conflict with people as a result of crop-raiding (A. Mekonnen pers. obs.). The intensity of this conflict in these areas is expected to increase as the area of good bamboo forest declines and the human population expands. As a result of these constraints, as well as hunting and administrative problems at the district level, wildlife populations are in decline in this region (Mekonen *et al.* 2017).

All threats are directly related to humans. The human population of Ethiopia is one of the fastest growing in the world with a 3.0% annual growth rate. At this rate, Ethiopia's population will be doubled within 30 years (WPP 2021). 'Rate of Natural Increase' of the human population in Ethiopia is 2.6%, compared to a worldwide rate of 1.1% (PRB 2021).

Conservation Actions (see Appendix for additional information)

Chlorocebus djamdjamensis is listed on Appendix II of CITES and on Class B of the African Convention on the Conservation of Nature and Natural Resources. About 34% of the known geographic distribution is within Bale Mountains National Park (2,150 km²).

Habitat degradation and destruction are the major threats to the long-term persistence of *C. d. harenaensis*. Since *C. d. harenaensis* heavily relies on bamboo, the uncontrolled harvest of bamboo from sites where this monkey occurs should be stopped within Bale Mountains National Park and sustainably managed elsewhere (Mekonnen *et al.* 2012, 2022). More surveys are required to better understand this species' geographic distribution and population size. In addition, it is important to put into place conservation actions, research, and monitoring activities that focus on *C. d. harenaensis*. Bringing the plight of *C. d. harenaensis* to wide national and international attention is required in order to fund and implement priority conservation actions.

Credits

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Reviewer(s): Reuter, K.E.

Authority/Authorities: IUCN SSC Primate Specialist Group

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External Resources

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Appendix

Habitats

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

Habitat	Season	Suitability	Major Importance?
1. Forest -> 1.9. Forest - Subtropical/Tropical Moist Montane	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	-	-	Low impact: 3
	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	-	-	Low impact: 3
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 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	-	-	Low impact: 3
	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 -> 5.1.3. Persecution/control	Ongoing	Minority (50%)	Rapid declines	Medium impact: 6
	Stresses:	2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.2. Species disturbance 2. Species Stresses -> 2.3. Indirect species effects		

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 part of 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
1. Land/water protection -> 1.1. Site/area protection
1. Land/water protection -> 1.2. Resource & habitat protection
2. Land/water management -> 2.1. Site/area management
5. Law & policy -> 5.1. Legislation -> 5.1.3. Sub-national level
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 -> 1.1. Taxonomy
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.3. Life history & ecology
1. Research -> 1.4. Harvest, use & livelihoods
1. Research -> 1.5. Threats
1. Research -> 1.6. Actions
2. Conservation Planning -> 2.1. Species Action/Recovery Plan
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): 2600
Continuing decline in area of occupancy (AOO): Unknown
Estimated extent of occurrence (EOO) (km ²): 4105
Continuing decline in extent of occurrence (EOO): Yes
Number of Locations: 1
Lower elevation limit (m): 2,315
Upper elevation limit (m): 3,250

Population
Continuing decline of mature individuals: Yes
Population severely fragmented: No
Extreme fluctuations in subpopulations: Unknown
All individuals in one subpopulation: No
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Yes
Movement patterns: Not a Migrant

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