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Species profile for *Colobus guereza*

**Report prepared for
The Tasmania Zoo**

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SPECIES PROFILE

Mantled guereza

Colobus guereza



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1. SUMMARY

The guereza, *Colobus guereza*, is a large glossy black monkey with a white mantle and a tail tuft. It is found in diverse regions of equatorial Africa. The natural range of this species is approximately 268,000 km², from the area of the Donga River region of Nigeria and the Yabassi District of Cameroon, eastwards across the Oubangui River from the Central African Republic to the northern Democratic Republic of the Congo, and then discontinuously eastwards to southern Sudan, Uganda, the Kenyan and Ethiopian highlands, and Mount Kilimanjaro, Mount Meru and the Kahé District of Tanzania..

Colobus guereza is not globally threatened and is listed as least concern by the IUCN. Although this species is locally threatened in parts of its range, the guereza remains relatively widespread and abundant, and, owing to its tolerance of forest degradation, is considered to be one of the least threatened species of colobus monkey.

The guereza is listed on Appendix II to the Convention on International Trade in Endangered Species of Wild Flora and Fauna and export and import of this species is therefore subject to regulation under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*.

The guereza is not currently listed as a species that may be imported into Tasmania under the *Nature Conservation Act 2002* and therefore import of this species into Tasmania is not permitted.

There is very little information on this species as an agricultural pest. The only reported negative effects from this species are a few instances of guerezas eating agricultural crops, probably due to inhospitable local environmental conditions. The guereza has not been reported as an environmental pest in any country and there are no established feral populations recorded in any other country or region worldwide.

The natural distribution of the guereza includes some areas similar in climate to Tasmania. and the climate match score of 7 indicates that there is a moderate risk of this species becoming established in Tasmania. If the guereza established in Tasmania it is unlikely to compete with any Tasmanian native species for food or other resources. The establishment of the guereza in Tasmania is also unlikely to impact on the agricultural industries. The purpose of importing a specimen of this species into Tasmania is to enhance the collection of the Tasmania Zoo for educational and display purposes.

2. NAME AND TAXONOMY

Kingdom:	Animalia
Phylum:	Chordata
Class:	Mamalia
Order:	Primates
Family:	Cercopithecidae
Genus:	Colobus
Species:	<i>Colobus guereza</i>
Subspecies:	<i>C. g. caudatus</i>, <i>C. g. dodingae</i>, <i>C. g. kikuyuensis</i>, <i>C. g. matschiei</i>, <i>C. g. occidentalis</i>, <i>C. g. percivali</i>, <i>C. g. gallarum</i>, <i>C. g. guereza</i>
Common names:	guereza, Abyssinan black-and white colobus, Abyssinian colobus, eastern black-and-white colobus, guereza colobus, guereza black-and-white colobus, magistrate colobus, magistrate black colobus, mantled guereza, white-mantled colobus

The subspecies classification of *Colobus guereza* is not well resolved. The IUCN list 8 subspecies (as listed above) following the arrangement of Groves (2001) and Grubb et al.

(2003). Other literature (Gron 2009,) list 7 subspecies; *C. g. caudatus*, *C. g. dodingae*, *C. g. guereza*, *C. g. kikuyuensis*, *C. g. matschiei*, *C. g. occidentalis*, *C. g. percivali*, following the arrangements of Groves (2005). Further taxonomic work is needed to assess the validity of the various described subspecies (Kingdon et al 2008).

There is no information of hybridisation of the guereza with other species (Gron 2009).

3. DESCRIPTION

The guereza is a large, sturdy colobus monkey with an black and white coat. Glossy black fur covers much of the body, but contrasts with short, white hair surrounding the face, and a U-shaped, cape-like mantle of long white hair that extends down the shoulders and across the lower back (Arkive 2011, Groves 2001). The tail is either a white or yellow colour from tip to base with a large white tuft at the end of the tail (Kim 2002). The face is grey and has no fur. At birth, the hair of infant guerezas is completely white, in striking contrast with the predominately black fur of the adult guereza (Arkive 2011).

Guerezas are slightly sexually dimorphic, with males weighing up to 1.19 times more than females (Kim 2002). Average weights for males fall between 9.3 and 13.5 kg while for females, the range of averages is between 7.8 and 9.2 kg. Head and body length averages 61.5 cm males and 57.6 cm in females (Gron 2009).

There is sexual dimorphism in teeth throughout the subspecies of *C. guereza*, ranging from males having consistently larger teeth than females (e.g., *C. g. caudatus*), to teeth being similar between the sexes (e.g., *C. g. guereza*), to instances where some female dentition is larger than male dentition (e.g, *C. g. gallarum*). In addition, in some cases, differences in canine size are reduced which could be attributable to habitat and socio-sexual factors (Gron 2009).

The guereza thumb is rudimentary and greatly reduced like most members of the colobus family (Gron 2009) and is either absent or represented by a small phalangeal tubercle that sometimes bears a nail. The loss of the thumb may be an adaptation for quick movements through the trees (Kim 2002).

The eight guereza subspecies each occupy a distinctive range and exhibit slight variations in appearance. The main features that set the subspecies apart are the length and colouration of the mantle, which sometimes appears creamy or yellow, the length of the tail, and the extent of the tail tuft (Gron 2009). In rare instances, almost entirely white individuals are reported from the west side of Mt. Kenya (Gron 2009). A comprehensive description of guereza subspecies features was made by Groves (2001).

4. CONSERVATION AND LEGAL STATUS

The guereza remains relatively widespread and abundant, and, owing to its tolerance of forest degradation, is considered to be one of the least threatened species of colobus monkey. Although the species as a whole is a low priority for conservation, several subspecies are in a more precarious state than others. Clearance of forests for agriculture is a major concern for some guereza populations, particularly those belonging to the subspecies *C. g. gallarum* and *C. g. matschiei*, both of which have a relatively small range in East Africa (Kingdon et al 2008, EOL 2011). In the absence of recent survey work, it is not known how much pressure these populations are under and therefore both subspecies are currently listed as Data Deficient on the IUCN Red List, as is *C. g. dodingae* which was last recorded in the 1960s. The persecution of guereza for meat and pelts is an additional threat in parts of its range. In particular, commercial trade in guereza skins is believed to be putting *C. g. percivali*, the only subspecies classified as Endangered, at considerable risk of extinction (Arkive 2011).

CONSERVATION STATUS

Colobus guereza is not globally threatened and is listed as least concern by the IUCN. Although this species is locally threatened in parts of its range, it is not thought to be declining fast enough to place it in a higher category of threat.

Subspecies: *Colobus guereza caudatus* (Mt. Kilimanjaro guereza), *C. g. kikuyuensis* (Mt. Kenya guereza), *C. g. guereza* (Omo River guereza) and *C. g. occidentalis* (Western guereza) are classified as Least Concern on the IUCN Red List. *C. g. gallarum* (Djaffa Mountains guereza), *C. g. dodingae* (Dodinga Hills guereza) and *C. g. matschiei* (Mau Forest guereza) are classified as Data Deficient, and *C. g. percivali* (Mt. Uaraguess guereza) is classified as Endangered on the IUCN Red List.

The guereza is listed on Appendix II to the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES). International trade in specimens of Appendix II species may be authorized by an export permit which is only be granted if the relevant authorities are satisfied that trade will not be detrimental to the survival of the species in the wild.

The guereza is listed on Class B of the African Convention on the Conservation of Nature and Natural Resources. Species in Class B are totally protected, but may be hunted, killed, captured or collected under special authorization granted by the competent authority.

LEGAL STATUS AUSTRALIA

The *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* regulates the export and import of species included in the Appendices to CITES under Part 13A. International trade in specimens of the guereza is therefore subject to regulation under this legislation.

The guereza is not currently listed as a species that may be imported into Tasmania under the *Nature Conservation Act 2002* and therefore import of this species into Tasmania is not permitted.

The importation of the guereza into Tasmania by the Tasmania Zoo will not contribute to any international effort to breed the species given its status of Least Concern with IUCN. The purpose of obtaining a specimen of this species is to enhance the collection for educational and display purposes.

5. LIFE HISTORY

The age of full sexual maturity in the guerezas is at least 6 years in males and 4 years in females. Each adult female produces one young every 20 months after a gestation period of about 6 months (Kim 2002, Gron 2009).

Reproduction takes place at all times of the year, with the adult male, or dominant male in multi-male groups, normally having exclusive access to the females members of the group (Arkive). The ovarian cycle is around 24 days, with females receptive about 5 days before ovulation until 2-3 days after ovulation. Females exhibit no external signs of oestrus (Gron 2009).

At birth, the infants are about 20 cm in head-body length and weigh approximately 400 g. The eyes are open and the infant clings to the mother's or father's stomach. Both the female and the male take part in the parenting of the child (Kim 2002). For the first few months of an infant's life, it is the focus of the group's attention, and is frequently handled, particularly by the females. When moving about during this time, the infant always hangs onto the fur of its mother's chest, but after around 20 weeks becomes more independent, and after 50 weeks no longer clings to its mother or suckles (Arkive 2011). Female guerezas remain in their natal group. This means that mothers and daughters have life-long relationships (Kim 2002).

At birth, guereza infants have white hair and pink to red skin in stark contrast with the black-and-white adults. By three weeks old the face and ears start to darken and become grey. The natal coat and skin continue to darken and reach adult coloration around 3-4 months old with males attaining adult coloration faster than females (Gron 2009).

High infant mortality has been observed in the wild (Oates 1977). In one study of a small sample infant mortality exceeded one third of infants dying before their pelage changed while after the colour change, mortality was low (Dunbar & Dunbar 1974). Infanticide has been observed in guerezas, usually committed by non-group or newly immigrated males (Gron 2009).

The lifespan of *Colobus guereza* is thought to be about 29 years in captivity and about 20 years in the wild (Kim 2002, AnAge 2011).

6. HABITAT REQUIREMENTS AND PREFERENCES

The guereza are predominantly found in forests and savanna woodlands within, and to the north, of the moist forests of central Africa, often extending into highland or montane forests (Oates et al. 1994). Other habitat types include primary, secondary, riparian, gallery, and upland forest, and moist lowland, medium-altitude and highland forests, rainforests, swamp forests and wooded grasslands (Oates 1977b, Dunbar 1987, Oates 1994, Fashing 2001, Harris & Chapman 2007). This species also inhabits disturbed, secondary, or colonizing forests, and prefers degraded forests to old growth when both are available (Thomas 1991; Lwanga 2006). In addition, they can be found in high forests in mountainous areas, including altitudes up to 3300 m as well as areas under human use, such as eucalyptus plantations (Gron 2009).

The guereza prefer to occupy the lower part of the trees if their area does not overlap with that of any other group of monkeys. When trees are not densely spaced, guerezas feed and travel on the ground (Kim 2002).

Because of their wide distribution, both in location and altitude, average temperatures and rainfall figures can vary considerably between habitats. At the Kibale National Park in western Uganda for example, daily annual temperatures in the moist evergreen forest range on average between 16.2°C and 23.3°C with average rainfall values ranging between 157cm and 175 cm (Butynski 1990). Being near the equator, only rainfall shows seasonal variation, peaking between March and May as well as between August or September and November (Gron 2009).

7. NATURAL GEOGRAPHIC RANGE

Colobus guereza is found in diverse regions of equatorial Africa. The species is widespread and ranges from the area of the Donga River region of Nigeria and the Yabassi District of Cameroon, eastwards across the Oubangui River from the Central African Republic to the northern Democratic Republic of the Congo, and then discontinuously eastwards to southern Sudan, Uganda, the Kenyan and Ethiopian highlands, and Mount Kilimanjaro, Mount Meru and the Kahé District of Tanzania (Kingdon et al 2008).

Within their range, guerezas are reported in the following countries: Cameroon, Central African Republic, Chad, Congo, Congo, The Democratic Republic of the Equatorial Guinea, Ethiopia, Gabon, Kenya, Nigeria, Rwanda, Sudan, Tanzania and the United Republic of Uganda.

The nominate *C. g. guereza* is found in forested areas of the Ethiopian highlands west of the Rift Valley and down into the lowland reaches along the Awash River, the Omo River and in the Blue Nile gorge.

The subspecies *C. g. occidentalis* occurs from eastern Nigeria, Cameroon and Gabon, eastwards to south-western Sudan and Uganda.

C. g. gallarum is restricted to the Ethiopian highlands east of the Rift Valley.

The subspecies *C. g. dodingae* is endemic to the Didinga Hills in south-eastern Sudan.

C. g. matschiei is found in Kenya west of the Rift Valley, and also in some of the forests within the Rift, west to Mount Elgon (Kenya and Uganda), and south to the Ngorongoro Crater and the Grumeti River in Tanzania.

C. g. percivali is restricted to the Matthews Range of Kenya.

C. g. kikuyuensis is known only from the Ngong Escarpment, Mount Kenya and the Aberdare Mountain Range, Kenya.

C. g. caudatus is present on montane forests of Mt. Kilimanjaro and Mt. Meru, and the adjoining forests at slightly lower altitudes (Kahe; Momela Lakes in Arusha National Park), Tanzania and Kenya.

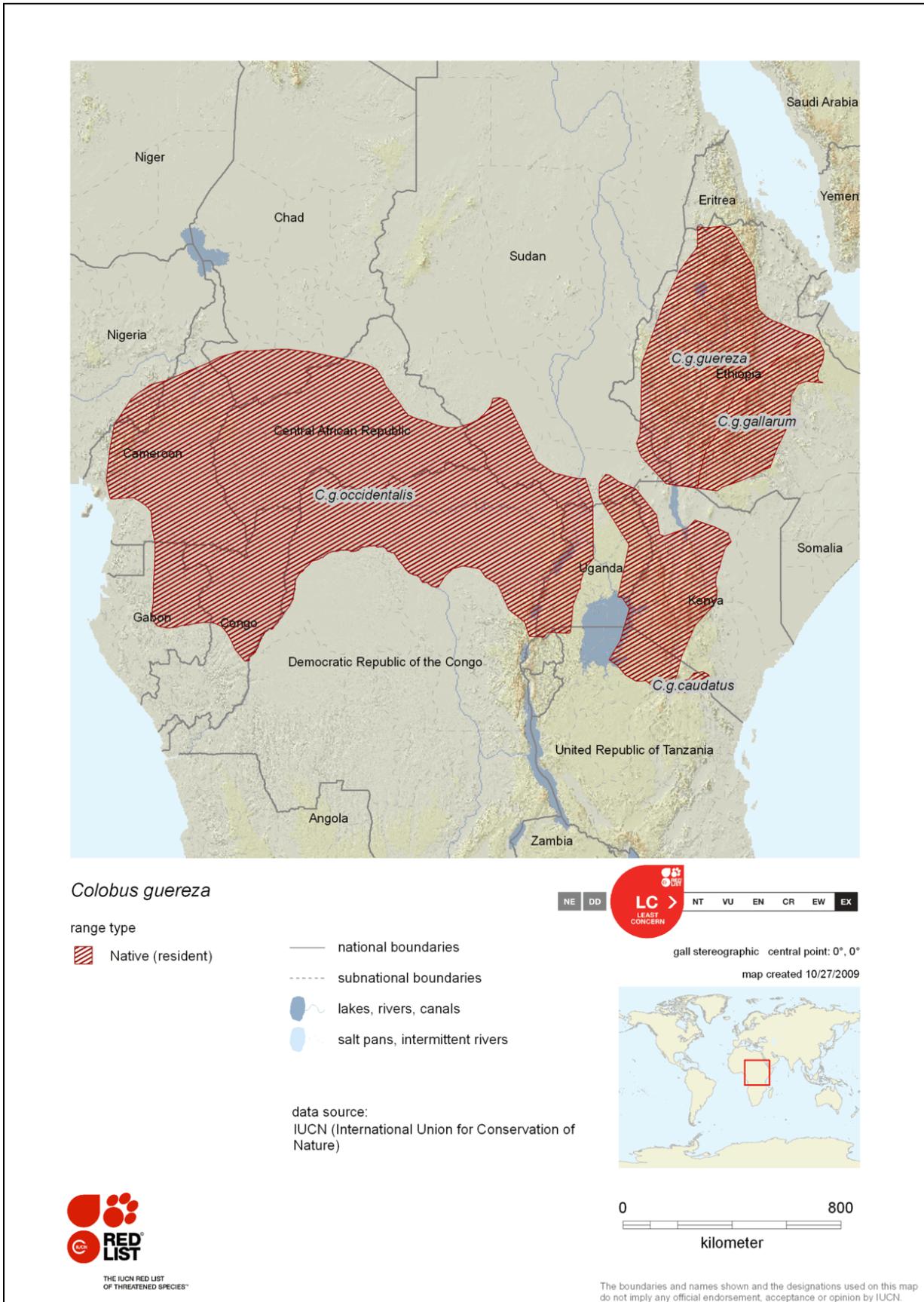


Figure 1: Geographic distribution of the *Colobus guereza* subspecies. Source: <http://www.iucnredlist.org/apps/redlist/details/5143/0/rangemap>.

8. INTRODUCED GEOGRAPHIC RANGE

There are no records of this species establishing feral populations in any other country or region.

9. POTENTIAL DISTRIBUTION IN TASMANIA

The natural distribution of the guereza includes some areas similar in climate to Tasmania. The Climate matching software (BRS 2011) calculated 7 grid squares with a score between 6 and 10, which suggests these areas are of suitable climate for guereza. The remaining 15 grids have scores of 0 to 4 and the climate is considered unsuitable. These scores were obtained using the Bomford risk assessment model (2008) which has been modified by DPIPW for assessments in Tasmania (DPIPWE 2011). A Climatch score of seven indicates that there is a moderate risk of this species becoming established in Tasmania. However, there are no records of this species establishing feral populations in any other country or region.

Although the guereza is adapted to a wide range of forested habitats which vary considerably in location, altitude, average temperatures and rainfall, this species is not known to have established feral populations outside its natural range. In the literature consulted there was no information on the ability of the guereza to survive and adapt to a different climate and habitat to that of its natural range. The factors that may limit the guereza's ability to expand its range or establish feral populations are its reliance on trees to sustain a mostly folivorous diet. In addition, the low rate of reproduction may limit the likelihood of establishment; female guerezas are not sexually mature until at least 4 years old, and each adult female produces one young every 20 months after a gestation period of about 6 months.

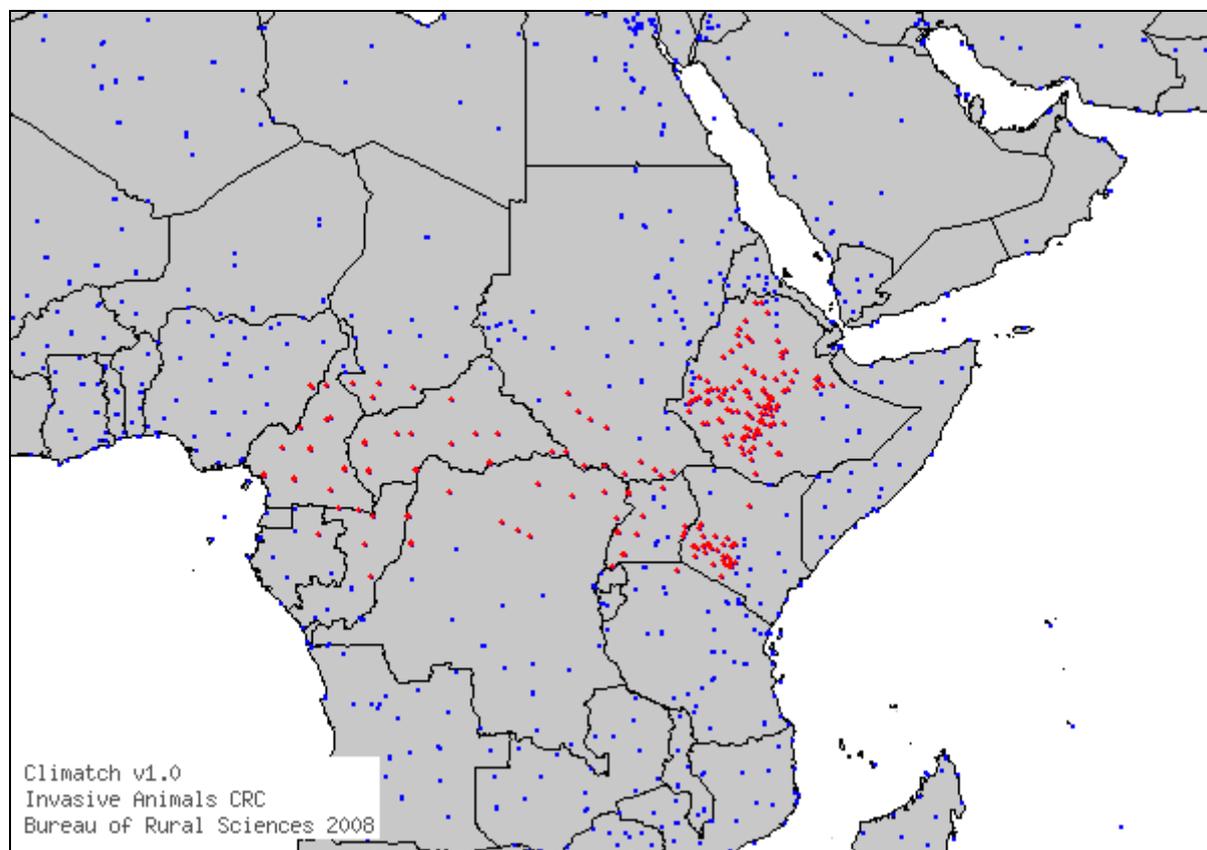


Figure 2: Map of central Africa showing the global distribution of the Colobus monkey (*C. guereza*) as selected for CLIMATCH modelling. (Source: CLIMATCH – <http://adl.brs.gov.au:8080/Climatch/>).

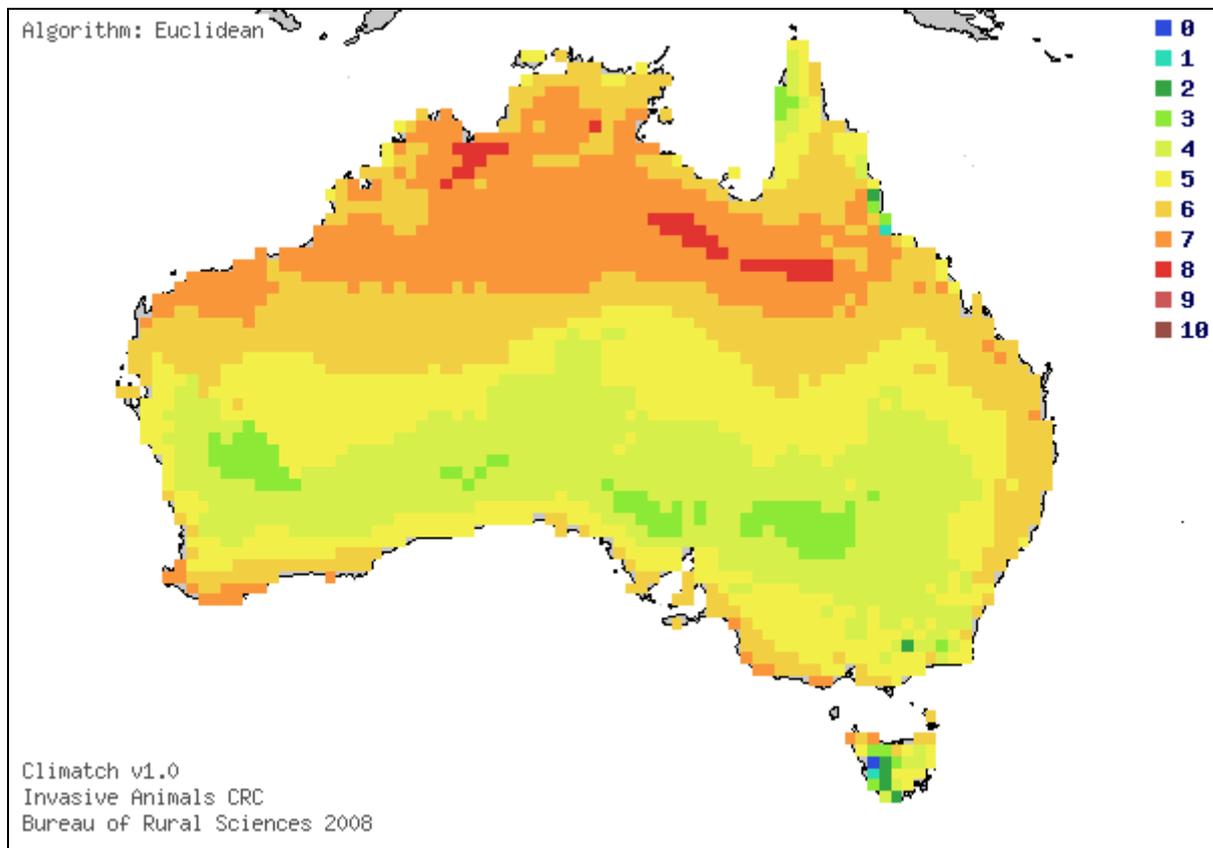


Figure 3: Climate match results showing the potential geographic distribution of the Colobus monkey (*C. guereza*) in Australia. Areas with a higher score (orange and red) are more likely to provide suitable habitat based on climate (Source: CLIMATCH – <http://adl.brs.gov.au:8080/Climatch/>).

10. DIET AND FEEDING BEHAVIOUR

Leaves constitute 78–94% of the guereza diet (Chapman et al 2007), consisting of mainly young leaves (especially from *Celtis durandii*, or Hackberry Tree) with about 12% mature leaves, 2-6% fruits and a small percent of leaf buds, blossoms, bark and wood, seeds, flowers, petioles, arthropods, water-plants and soil. However, the diet is highly varied seasonally and geographically; thus at times mature leaves may account up to 34% of the diet. Guerezas seem to prefer leaves that are less susceptible to seasonal fluctuations (Kim 2002). Fleshy fruits are usually consumed when unripe, with consumption being reduced as they fully ripen, likely to avoid competition with other primate species that prefer ripe fruit (Fashing 1999; Chapman et al. 2006; Harris & Chapman 2007). They get water from dew and the moisture content of their diet, or rainwater held in the tree trunk hollows (Kim 2002).

The guereza possess large and multi-chambered stomachs which allows them to better digest plant fibres, including foliage. This ability to digest plant material is also assisted by stomach bacteria. Together, these and other morphological adaptations allow the species to feed on large quantities of leaves (Gron 2009, Arkive 2011).

While primarily arboreal, the species will descend to the ground to feed and to travel in cases where there are not suitable arboreal pathways (Oates 1977b).

The African cherry tree (*Prunus africana*), a sometimes favoured food for guerezas, has exhibited a notable decline across sub-Saharan Africa. While predominantly due to the harvesting of its bark for medicines, at least some of its deaths could be due to other factors, such as disease, insects, nutrient deficiency, or climate (Fashing 2004). The decline of this plant negatively affects the guereza populations that rely upon it.

11. SOCIAL BEHAVIOUR AND GROUPINGS

Guerezas generally live in small, cohesive groups, typically ranging in size from 3 to 15 individuals, but occasionally up to as many as 23. These social groups sometimes support several adult males, but normally comprise one adult male, accompanied by several reproducing females, adolescents and infants (Arkive 2011). The core of the mixed group consists of the females, who remain in the group of their birth for life. These females are thought to be close relatives that display their friendly intragroup relationships, marked by mutual grooming and well-developed "infant transfer." This latter phenomenon consists of an infant being handled by several females soon after birth and carried as far as 25 m from its mother. A mother may even suckle the infant of another female and her own simultaneously (Kim 2002).

Unlike females, young males leave the group of their birth before they are fully mature. The adolescent guereza males leave their birth group either voluntarily or due to pressure from the adult male of the birth group. Upon leaving their natal group, young males lead a solitary life or temporarily associate with other solitary males. They may eventually take over their own harem and create a new group (Kim 2002).

Within multi-male groups, one male is dominant to the others and interactions between the adult males are aggressive, with some males eventually being forced out. There are definite indications of infanticide in consequence of the threat of male replacements within mixed groups (Kim 2002).

The home range is variable, with full home range estimates ranging from just over .01 km² to 1 km² and most estimates at the lower end of this range (Gron 2009). In long-term studies, single-group day range averages were between 252 and 734 m, ranging as small as 62 m in a day to over 1360m (Oates 1977a; Fashing 2001a). Although territories may overlap marginally, they are vigorously defended by males with leaps and cries, hand-to-hand communication, roars, and occasional chasing and fighting. Displays of the white fringe fur flapping up and down serve as warning to other monkeys. Some groups, however, do share water holes and other essential resources (Kim 2002).

Male guerezas roar loud nocturnal and dawn choruses as a means of spacing groups. Six vocal sounds have been recorded: roars, snorts, purrs, honks, screams and tongue clicks (Gron 2009). In addition to vocal communication, visual signals, such as flapping of fringe fur, facial expression, and body posture are used in aggressive communication between groups. Tactile communication in this species includes grooming, playing, and fighting (Kim 2002).

Despite being a diurnal species, the guereza spends over half the day resting, with the remaining hours of daylight devoted mostly to feeding and moving about. When active, this primarily arboreal species can be seen bounding through the canopy, leaping from tree to tree. The guereza sleeps during the night, with a single group generally occupying several adjacent trees nearby a source of food. To communicate, the guereza employs various vocalisations, the most distinctive being impressive loud roar usually made by the dominant adult male and echoed by males in neighbouring groups. These roaring bouts, which usually take place during the night or at dawn, are thought to play a role in male-male competition and help maintain spacing between groups (Arkive 2011, Gron 2009, von Hippel 1998).

The guereza is often found living in sympatry with a number of other primate species (Gron 2009). Infant guerezas have been observed playing with infant vervets (*Chlorocebus aethiops*) (Chapman & Chapman 1996).

12. NATURAL PREDATORS AND DISEASE

The guereza has several predators (Kim 2002, Arkive 2011). The main predator of the guereza is the crowned hawk-eagle (*Stephanoaetus coronatus*). The chimpanzee (*Pan troglodytes*), has also been observed hunting the species, and remains have also been found in the scats of leopards (*Panthera pardus*) Other potential predators include other raptors such as Verreaux's eagles (*Aquila verreauxii*) (Gron 2009).

Historically, a large commercial trade in guereza skins has existed, especially during the 19th century but continued into recent times, often for fashion or the tourist trade (Oates 1977b).

Not surprisingly, this represents a significant threat to the species. The persecution of guereza for meat is also a threat in parts of its range (Arkive 2011).

The guereza appears to be susceptible to some parasites such as the intestinal nematode parasite or whipworm, *Trichuris trichiura* (Rabineau 2009) and the protozoa *Cyclospora colobi*. (MAF Biosecurity NZ 2011). The whipworm parasite has been recorded in high levels in many primates including the guereza (Gillespie et al. 2005; Chapman et al. 2005). Levels of infection (determined by eggs in faecal samples) may be an indicator of the health of the individuals (Rabineau 2009).

13. THREAT TO HUMAN SAFETY

The guereza do not initiate contact with humans (Grzimek 1988). There are no records of this species causing physical injury to humans.

In the literature consulted there were no recorded adverse disease effects of guerezas upon humans

Cyclospora cayetanensis is a protozoan that causes diarrhoea in humans and is often found in travellers. *Cyclospora* spp. are strictly host specific and therefore *Cyclospora* spp. that infect primates will not infect humans (MAF Biosecurity NZ 2011).

Yellow fever virus is mosquito-borne and causes serious, frequently fatal, disease in humans. It is confined to tropical parts of South America and Africa, where the virus infects primates. In South America, cases of yellow fever are confined to those transmitted in a monkey-mosquito-human cycle in people who enter the jungle. In Africa, large outbreaks occur in a human-mosquito-human cycle. Colobus monkeys are one of many species African primates which may be infected (MAF Biosecurity NZ 2011). Yellow fever has remained confined to tropical Africa and South America and does not occur in Australia. The mosquitoes (*Aedes aegypti*) that can transmit the disease are common in the coastal regions of northern Queensland but do not occur in Tasmania (DHE 2011).

14. HISTORY AS A PEST

The guereza has not been reported as an environmental pest in any country and there are no established feral populations recorded.

There is very little information on this species as an agricultural pest. The only reported negative effects from this species are the few instances when guerezas eat agricultural crops, probably due to inhospitable environmental conditions (Grzimek 1988 in Kim 2002). In a 1987-1989 survey of over 1,000 people living adjacent to several national parks and game reserves in Tanzania, guerezas were listed among the many primate species reported to be involved in crop raiding (Sillero-Zubiri and Switzer 2001).

15. POTENTIAL IMPACT IN TASMANIA

It is unlikely that this species would become an environmental pest if it did become established in Tasmania. There are no Tasmanian native species with which the guereza is likely to compete for food and other resources. The guereza feed almost exclusively on leaves, which make up nearly 90% of their diet, whilst fruit, seeds, flowers, bark, stems, lichen and soil make up the rest (Chapman et al 2007). The guereza does not occupy tree hollows and is not a predator.

There is very little information on this species as an agricultural pest, although there are some instances where guerezas have been reported to eat agricultural crops, possibly due to inhospitable environmental conditions (Grzemik 2008). Commodities that may be susceptible to this species would be fruit and flower crops. Given that fruit and flowers constitute a very low percent of the guereza diet (fruit 6% and flowers 2%) the risk of this species being a pest to agriculture is unlikely. A climate match with Tasmania for this species shows that 10-50%

of the range of susceptible commodities (fruit and flowers) overlap with grid squares with a climate match score of 5 & 6.

The guereza does not usually initiate contact with humans (Kim 2002). There are no records of this species causing damage to property or infrastructure.

6. PREVIOUS RISK ASSESSMENTS

The Vertebrate Pests Committee (2007) assessed *Colobus guereza* as being in the Serious Threat Category. Species placed in the Serious Threat Category "...may be introduced and/or should be kept only in collections approved by the relevant state/territory authority as being primarily kept for (1) public display and education purposes, and/or for (2) genuine scientific research approved by the relevant state/territory authority, and as meeting best practice for the purposes of keeping the species concerned" (VPC 2007). In an earlier assessment by the Vertebrate Pests Committee the guereza was placed in category 2 - limited to statutory zoos or endorsed special collections (VPC 2007).

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