

NEOTROPICS



BROWN HOWLER MONKEY

Alouatta guariba Humboldt, 1812

Brazil, Argentina
(2012, 2014, 2016, 2018)

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Alouatta guariba is endemic to the Atlantic Forest in eastern Brazil and northeastern Argentina. In the south, its range is limited by the Camaquã river basin in the state of Rio Grande do Sul (Printes *et al.* 2001) and to the north the limit is Boa Nova, southern Bahia, south of the Rio de Contas (Neves *et al.* in prep.), although it occurred north as far as the right (south) bank of the Rio Paraguaçu in the past (Gregorin 2006). The western boundary is marked by the limits of the Atlantic Forest. In Argentina, the species occurs in the province of Misiones (Agostini *et al.* 2014). Although with some uncertainty, two subspecies are recognized: the southern brown howler, *A. guariba clamitans*, and the northern brown howler, *Alouatta g. guariba*, north of the rios Jequitinhonha or Doce (Rylands *et al.* 2000; Glander 2013).

The brown howler is a folivore-frugivore, including more or less fruit in its diet according to seasonal availability (Neville *et al.* 1988; Chaves and Bicca-Marques 2013). As such, brown howlers are important seed dispersers for numerous plant species (Chaves *et al.* 2018). Home range size varies between study sites but averages 13 ha (Fortes *et al.* 2015). Ranges of 15 groups studied varied from 1.8 to 33 ha (Miranda and Passos 2011). Day range varies from 50 m to 1,677 m (Fortes *et al.* 2015). Groups average 4 to 6 individuals, but can be as large as 13 (Jardim 2005; Miranda and Passos 2005; Ingberman *et al.* 2009). Unimale-unifemale and multimale-multifemale groups have been reported (Glander 2013). The size of an adult male is 50–60 cm (head-body) and 52–67 cm (tail), while an adult female is 44–54

cm (head-body) and 48–57 cm (tail). Adult males weigh 5.3–7.2 kg and adult females weigh 4.1–5.0 kg (Glander 2013). Longevity is estimated at 15–20 years (Strier 2004). Females have single offspring, with an interbirth interval of 9–22 months (Strier *et al.* 2001).

As for all the Atlantic Forest primates, the brown howler has suffered extensive habitat loss since European arrival in South America more than five centuries ago. During the colonization process, the forest cover was broadly devastated due to exploitation of natural resources (e.g., Brazil wood, gold), extensive agriculture (e.g., sugar cane, coffee) and cattle ranching. This region today concentrates around 70% of the Brazilian population (~150 million people) and the principal capital cities, with corresponding industrial activity and urbanization (Scarano and Ceotto 2015). In Brazil, the Atlantic Forest has been reduced to 11.7% of its original coverage (Ribeiro *et al.* 2009). The remaining

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forest is immensely fragmented into hundreds of thousands of patches, of which the great majority are 50 ha or less (Ribeiro *et al.* 2009), hence unsuitable to support viable populations in the long term. Being one of the largest primates in the Atlantic Forest, the species has been extensively hunted, and also suffers to some extent from the pet trade.

Disease epidemics are an additional and very serious threat. Howlers are highly susceptible to yellow fever, and two recent outbreaks (2008/2009, 2016/2018), have severely affected



their numbers throughout the Atlantic Forest (Holzmann *et al.* 2010; Almeida *et al.* 2012; Bicca-Marques *et al.* 2017). Due to misinformation and the dissemination of the fear that humans could be infected directly through contact or proximity with monkeys, howlers were persecuted, with many injured and killed during the outbreaks (Bicca-Marques *et al.* 2017). In the next few decades, pathogen exposure could act synergistically with other threats such as habitat loss, putting populations at high extinction risk.

Southern brown howlers (*Alouatta guariba clamitans*) occur in lowland forests along Brazil's coast, as well as in higher elevation sub-montane and montane forests and seasonal semi-deciduous forests inland (Bicca-Marques *et al.* 2018). In southern Brazil and northeast Argentina, they also occupy a transition of mixed Upper Paraná Atlantic Forest and Araucaria Moist Forest (Miranda and Passos 2005; Agostini *et al.* 2014). Aguiar *et al.* (2007) recorded the species in periodically flooded and semi-deciduous forests in the Paraná river floodplains.

The primary threats are widespread forest loss and fragmentation throughout the subspecies' range due to logging, agriculture and cattle-ranching (Bicca-Marques *et al.* 2018). Attacks by domestic dogs, traffic accidents, and electrocution are serious threats to howlers living close to urban areas (Printes *et al.* 2010; Chaves *et al.* in prep.). The design and implementation of conservation strategies for the southern brown howlers in urban and suburban regions are crucial for the long-term survival of these animals (Jerusalinsky *et al.* 2010).

Although some local population census data are available for Brazil, the total remaining population is unknown, but certainly declining. In Argentina, the situation is even worse; only a few populations persist with no more than 20–50 adult individuals (Agostini *et al.* 2014).

The southern brown howler is listed as Vulnerable on the Brazilian list of threatened fauna (Brazil, MMA 2014) and the IUCN Red List (Buss *et al.* in prep), but may be a candidate for the Endangered category after the 2016–2018 yellow fever outbreak (Bicca-Marques *et al.* 2017). It is considered Critically Endangered in Argentina (Agostini *et al.* 2012).

BROWN HOWLER MONKEY

The northern brown howler monkey (*Alouatta guariba guariba*) inhabits lowland, submontane and montane Brazilian Atlantic forest. It has a considerably more restricted range than *A. g. clamitans* and is classified as Critically Endangered both in the Brazilian list of threatened fauna (Brazil MMA 2014) and the IUCN Red List (Mendes *et al.* 2008). It has been listed as one of the world's 25 most endangered primates since 2012 (Neves *et al.* 2017). Adding the locations in the lower reaches of the Jequitinhonha basin reported by Rylands *et al.* (1988) and the small populations of *A. g. guariba* discovered in the last few years, the total population is unlikely to sum more than 250 mature individuals, and no subpopulation is believed to have more than 50 mature individuals (Neves *et al.* 2018). Overall, the main threats to the wild populations of this subspecies are habitat fragmentation, hunting, and the very small sizes of the scattered populations (Neves *et al.* 2017).

There are protected areas in the northern brown howler's range in the state of Bahia and northeastern Minas Gerais, all created since 1980. Nevertheless, the only strictly protected area where the species has been confirmed is the Mata Escura Biological Reserve (51,046 ha), just north of the middle Rio Jequitinhonha (Melo 2005).

The two subspecies of *Alouatta guariba* are included in the *Brazilian National Action Plan for Conservation of the Atlantic Rainforest Primates and Maned Sloth* (Brazil MMA 2018), and will be part of the Primate Conservation Action Plan of Argentina which will be produced in 2019. These plans provide measures to identify important areas for conservation in order to (a) restore, maintain and increase habitat and its connectivity, (b) mitigate the impact of roads and power lines, and (c) assess and mitigate the impact of epizootics on the species.