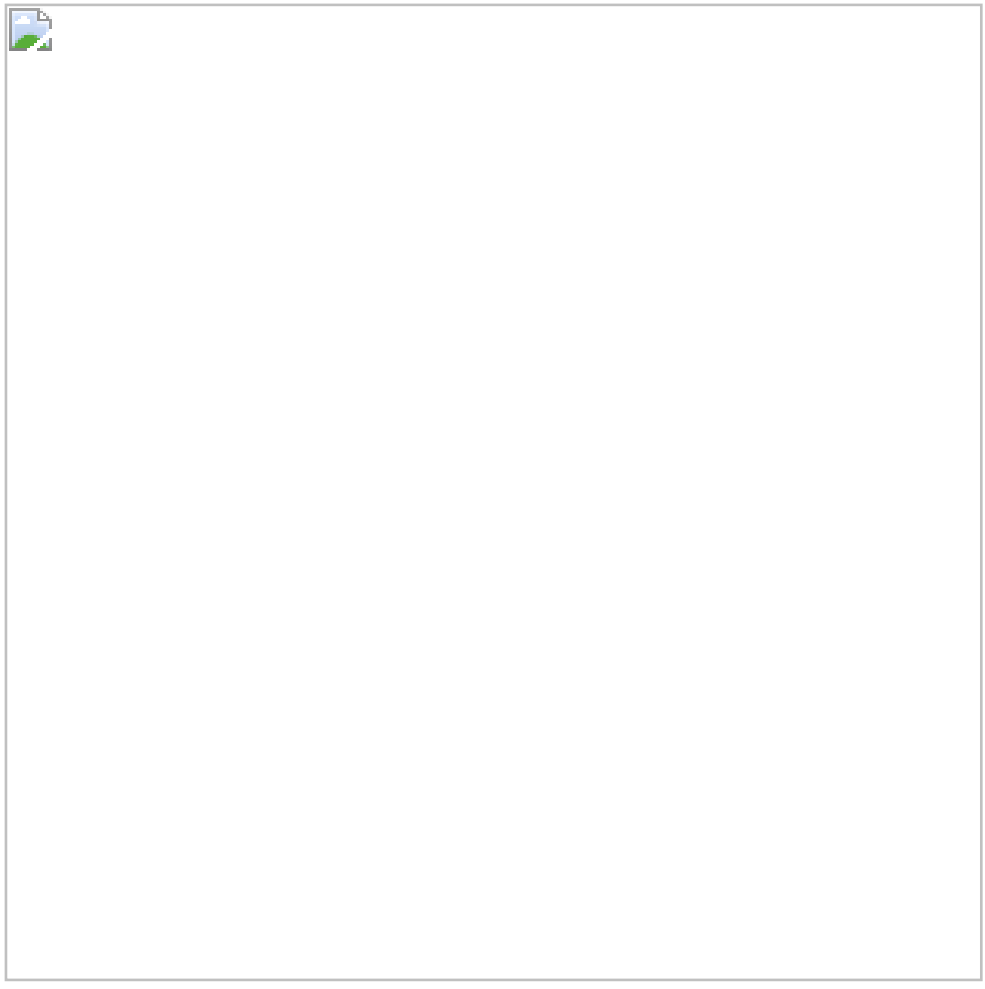

The 2010 Sloth Red List Assessment

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The 2010 Sloth Red List Assessment

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Abstract

The conservation status of all sloth species was re-assessed in May and June 2010 by the IUCN/SSC Anteater, Sloth and Armadillo Specialist Group. Four out of six species were categorized as Least Concern. Two sloths were classified in a threatened category according to the IUCN Red List of Threatened Species; *Bradypus torquatus* was listed as Vulnerable, and *Bradypus pygmaeus* as Critically Endangered. Sloths are mainly threatened by hunting, illegal pet trade, and by habitat degradation and fragmentation. According to the 2010 assessment, the taxonomy of all six species requires further research. Data on their population size, range, and dynamics, as well as their life history, is still insufficient.

Keywords: Conservation status, threats, *Bradypus*, *Choloepus*, Pilosa, Xenarthra

Introduction

Six years after the last assessment (Fonseca and Aguiar, 2004), the IUCN/SSC Anteater, Sloth and Armadillo Specialist Group re-evaluated the conservation status of the four *Bradypus* and two *Choloepus* species in May and June 2010. The IUCN Red List Categories and Criteria, version 3.1 (IUCN, 2001) were used. Eight researchers provided data on the geographic range, population size and status, habitat and ecology, threats, and existing conservation measures of sloths. All assessments were checked for consistency by at least two specialists.

Five sloths maintained their Red List category, while *Bradypus torquatus* was downgraded from Endangered to Vulnerable due to new and more accurate data on its extent of occurrence (Table 1). As in 2004, four out of six species were categorized as Least Concern. The population trend of these sloths is, however, unknown (Table 1). Two sloths were classified in a threatened category: *Bradypus pygmaeus* was listed as Critically Endangered, and, as mentioned before, *Bradypus torquatus* was re-categorized as Vulnerable (Table 1). Both species have negative population trends and thus require close monitoring.

Sloths are mainly threatened by hunting, either to be used as a protein source or to be (illegally) sold as pets (at least four out of six species), and by habitat degradation and fragmentation (*B. torquatus* and *C. hoffmanni*). Several research gaps have been identified; according to the 2010 assessment, the taxonomy of all six species requires further research (Fig. 1). Furthermore, data on their population size, range, and dynamics, as well as their life history, is still insufficient.

All sloths occur in at least one protected area, and education programs are in place in part of the range of five species (Fig. 2). *Bradypus torquatus* is the only xenarthran for which an action recovery plan exists. *Bradypus variegatus* is listed in CITES Appendix II, and the Costa Rican populations of *C. hoffmanni* are included in Appendix III (CITES, 2009). No harvest management or area-based management plans exist for any sloth species.

We thank all researchers, graduate students, rangers, and enthusiasts who participated in the 2010 Sloth Red List Assessment. Detailed species descriptions and updated range maps can be found on the following pages.

Table 1. Historical overview of the Red List categories and current population trends of the six sloth species. See glossary for definitions of the categories.

Species	1996	2004	2010	Population trend
Bradypus pygmaeus	--	**CR** B1ab(i,ii,iii)	**CR** B1ab(ii,iii)	↓
Bradypus torquatus	**EN**	**EN** B1ab(i,ii,iii)	**VU** B2ab(i,ii,iii)	↓
Bradypus tridactylus	**LR/lc**	**LC**	**LC**	**?**
Bradypus variegatus	**LR/lc**	**LC**	**LC**	**?**
Choloepus didactylus	**DD**	**LC**	**LC**	**?**
Choloepus hoffmanni	**DD**	**LC**	**LC**	**?**

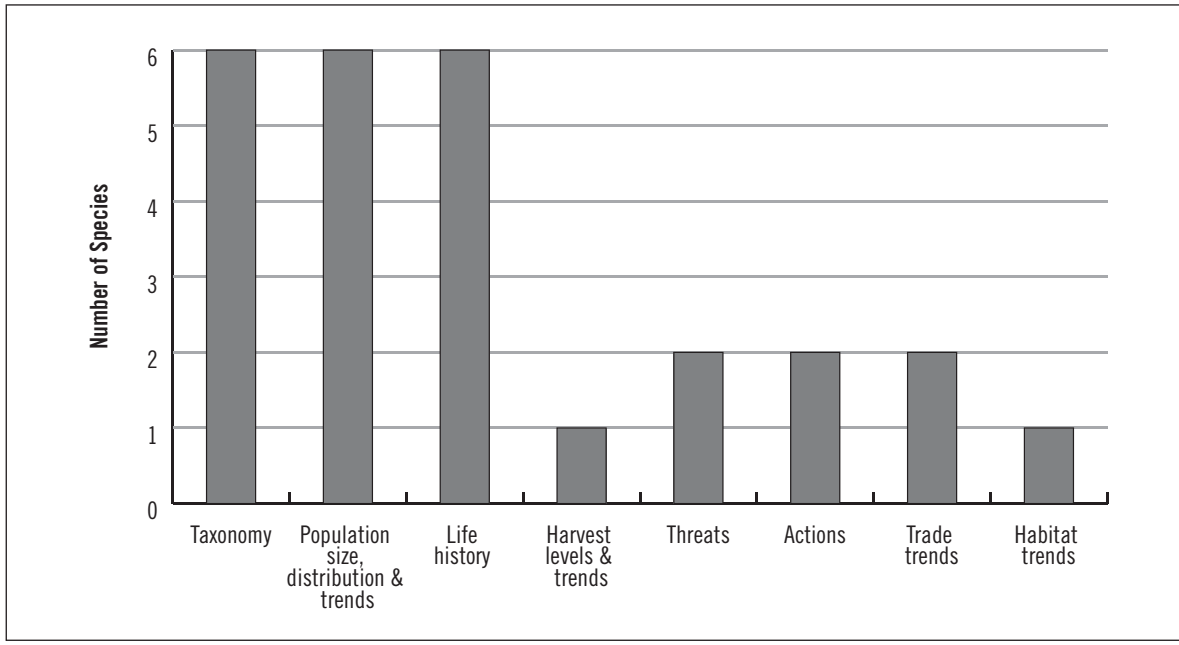

Figure 1. Research priorities for sloths

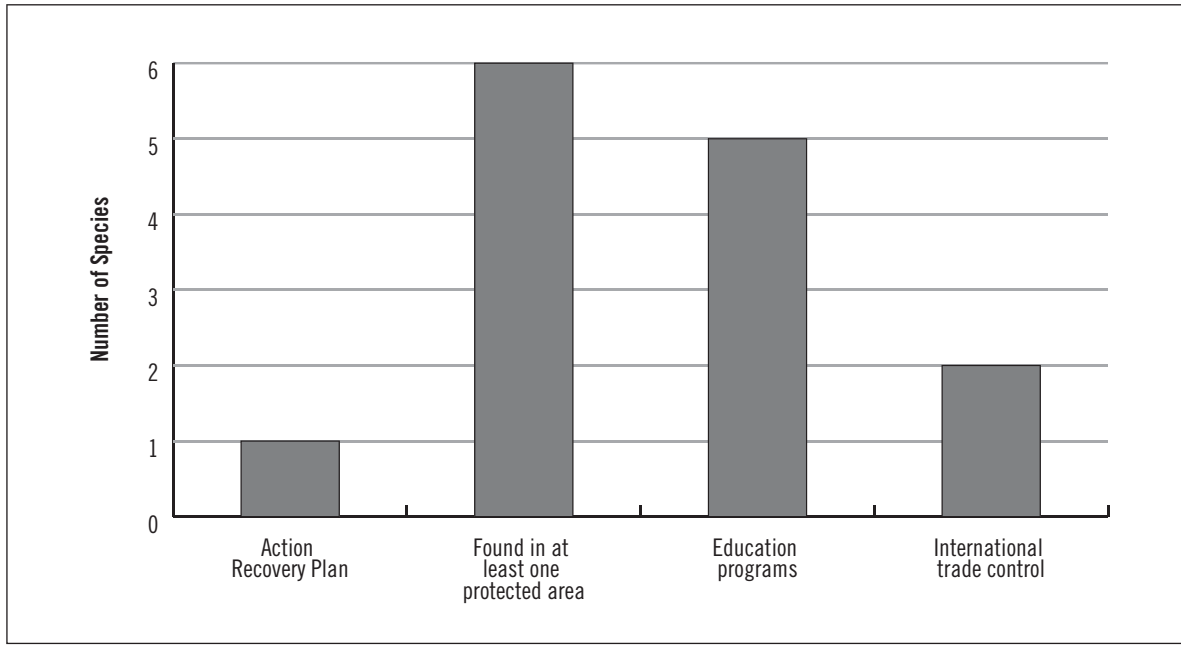

Figure 2. Existing conservation measures for sloths

Bradypus pygmaeus

Critically Endangered (CR B1ab(ii,iii))

Photograph: Bryson Voirin

Common Names: Pygmy three-toed sloth (English), perezoso pigmeo (Spanish), preguiça anã (Portuguese).

Assessment Rationale: *B. pygmaeus* is listed as Critically Endangered as this species has a very restricted range, being found only on one very small island less than 5 km² in size, and there is likely a continuing decline in the quality of habitat and area of occupancy due to habitat degradation.

Taxonomic Note: *B. pygmaeus* has only recently been described as a separate species (Anderson and Handley, 2001).

Geographic Range: *B. pygmaeus* is known only from Isla Escudo de Veraguas, in the islands of Bocas del Toro, Panama (Fig. 3). Sloths on the younger islands of the Bocas del Toro archipelago are conspecific with *Bradypus variegatus* (Anderson and Handley, 2001, 2002). Isla Escudo de Veraguas has an area of approximately 4.3 km² and is about 17.6 km from the mainland of Panama. Based on the area of red mangrove forest on Isla Escudo de Veraguas, the area of occupancy is estimated at 1.3 to 1.5 km².

Population: There is no information available on the population status of *B. pygmaeus*. The population is likely to be relatively small and presumably consists of less than 500 individuals.

Habitats and Ecology: This smallest of all sloths has only been recorded in the red mangrove forests surrounding the island, currently estimated at 1.3 to 1.5 km². It has not been recorded from forest patches within the island. As far as is known, it primarily, if not exclusively, feeds on mangrove leaves.

Threats: Although the island is uninhabited, there are seasonal visitors (fishermen, lobster divers and local people) who are known to opportunistically hunt the sloths (B. Voirin, pers. comm., 2010). Preliminary studies suggest a low level of genetic diversity among pygmy sloths (Silva *et al.*, 2010; N. Moraes-Barros, pers. comm., 2010), which could lead to endogamic depression if the (already low) population size decreases any further.

Conservation: *B. pygmaeus* is endemic to a single island of Panama, which is protected as a wildlife refuge and is contained within the Comarca Indigenous Reserve. There is a need to improve the enforcement of this protected area, which currently receives little attention from wildlife protection authorities. Conservation of the species could be improved through local awareness programs, specifically those promoting sloths as conservation flagship species.

Assessors: Anderson, R., Moraes-Barros, N. and Voirin, B.

Evaluators: Superina, M. and Abba, A.M.

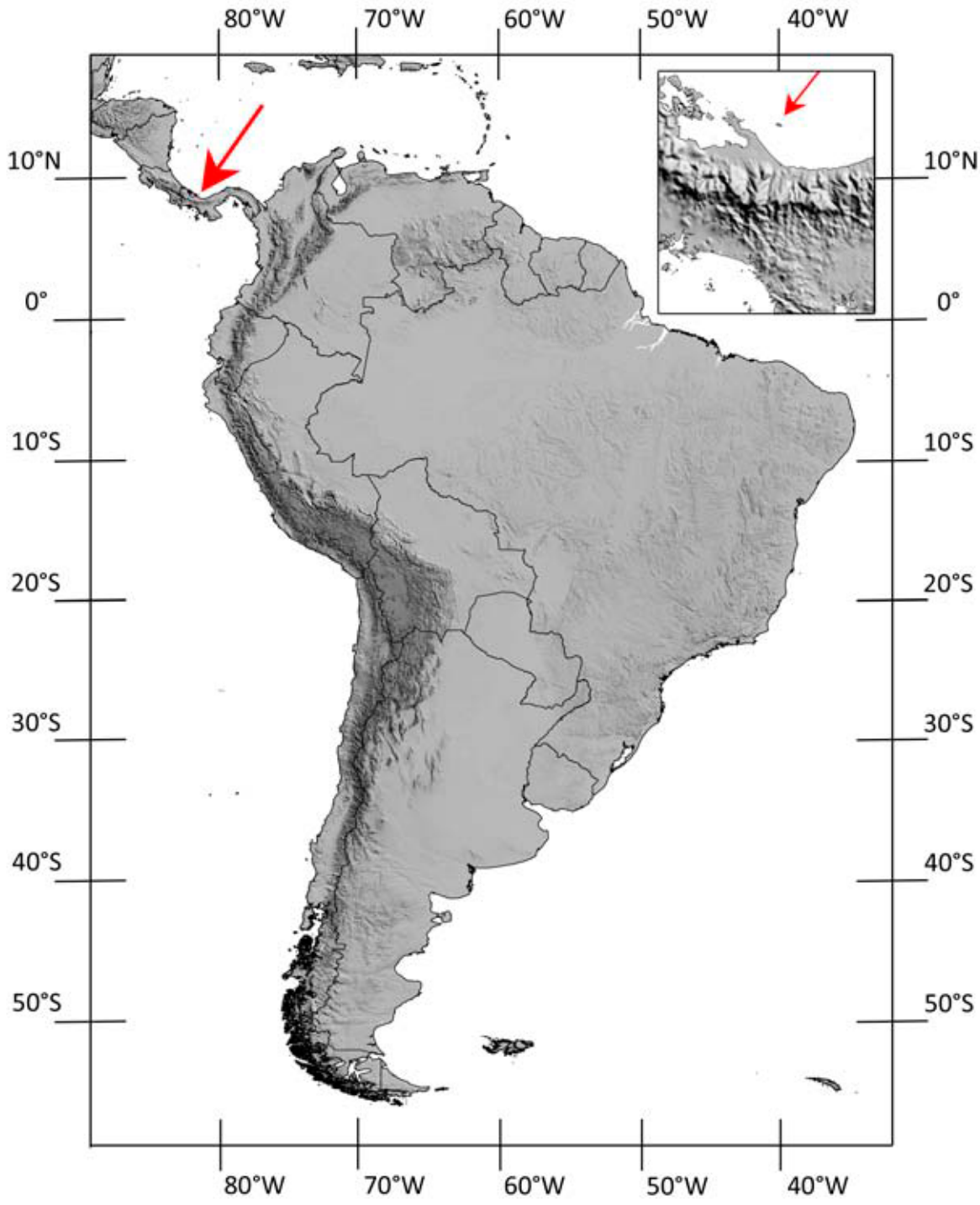

Figure 3. *Bradypus pygmaeus*. Based on Anderson and Handley (2001); Gardner (2007); Aguiar and Fonseca (2008).

Bradypus torquatus

Vulnerable (VU B2ab(i,ii,iii))

Photograph: Kevin Schafer, www.kevinschafer.com

Common Names: Maned three-toed sloth (English), maned sloth (English), preguiça (Portuguese), preguiça-de-coleira (Portuguese), bicho-preguiça (Portuguese).

Assessment Rationale: *B. torquatus* was previously listed as Endangered based on its very restricted extent of occurrence. However, new data and a detailed range analysis based on all confirmed locations and habitat preferences revealed that the extent of occurrence is larger than previously thought. Recent analyses of the available habitat left for *B. torquatus* suggest that this species has an area of occupancy less than 1,000 km² (based on remaining forest within its highly fragmented range). Nevertheless, its range, area of occupancy, and habitat are in continuing decline due to ongoing habitat loss and degradation in the Brazilian Atlantic forest. Furthermore, it is threatened by hunting. *B. torquatus* is therefore listed as Vulnerable, with the caveat that a re-assessment should be performed as soon as more data on the wild populations become available.

Taxonomic Note: There are three genetically distinct populations of this species in the states of Bahia, Espírito Santo and Rio de Janeiro (Moraes-Barros *et al.*, 2002, 2006; Lara-Ruiz *et al.*, 2008). The northern population (in southern Bahia) might be considered a separate subspecies (Lara-Ruiz *et al.*, 2008), although indistinguishable from the others in external morphology (A. Chiarello, pers. comm., 2010). For information on the genetic diversity of maned sloths, see also Lara-Ruiz (2004).

Geographic Range: *B. torquatus* is restricted to the coastal Atlantic forests of eastern Brazil (Fig. 4). Historically, it possibly occurred throughout the coastal forest of Bahia through to the state of Pernambuco (footnote by O. Pinto in Wied's 19th century account; Coimbra-Filho, 1972). At present, the southern part of the state of Bahia is the primary stronghold for the species. Maned sloths were recently reported from the state of Sergipe (Chagas *et al.*, 2009) but thus far no records have been collected in the adjacent state of Alagoas. The extensive deforestation of suitable habitat in this state suggests that it is unlikely to survive there. A natural biogeographic gap occurs in northern Espírito Santo, perhaps due to a higher degree of deciduity in the forests of this region (Hirsch and Chiarello, in press). The species does not occur from the left bank of Doce River to the vicinity of Mucuri River. It has been reported from extreme northern Minas Gerais on the left bank of Jequitinhonha River. *Bradypus torquatus* has been introduced to some National Parks in Espírito Santo (Caparaó National Park) and Rio de Janeiro (Tijuca National

Park), among other areas, although it is not known if the species is still present at these sites. It ranges from sea level to 1,290 m asl. Its extent of occurrence is estimated at 90,000 km^2 (Hirsch and Chiarello, in press) and its area of occupancy at 1,000 km^2 (Hirsch and Chiarello, unpublished data).

Population: In some parts of Bahia and Espírito Santo, the animals are locally abundant in forest fragments (Chiarello, pers. comm., 2010) although the population density is not well known. Genetic studies indicate no gene flow between the populations of southern Bahia (Ilhéus) and Espiríto Santo (Santa Teresa), and those of Poço das Antas (Rio de Janeiro). It appears that these populations have been isolated before the anthropogenic fragmentation of habitat, possibly beginning in the Pleistocene (Moraes-Barros *et al.*, 2006; Lara-Ruiz *et al.*, 2008). In general, little genetic diversity is exhibited within individual populations, but the northernmost population (Bahia) is the genetically more diverse (Moraes-Barros *et al.*, 2006; Lara-Ruiz *et al.*, 2008). Overall, the global population of *B. torquatus* is assumed to be decreasing in response to the continuing loss and fragmentation of suitable habitat, the Atlantic forest (Ribeiro *et al.*, 2009).

Habitats and Ecology: This largely arboreal species is found in wet tropical forest, most typically in areas with an annual precipitation of 1,200 mm or higher and lacking a dry season. Most records are from evergreen forests, and just a handful of sightings are from semi-deciduous forests (Hirsch and Chiarello, in press). It can be found in secondary forest habitats, including "cabrucas" (cocoa plantations under native forests in southern Bahia; Cassano *et al.*, in press). Some animals have been sighted in forest fragments as small as 20 ha, although the long-term persistence of populations at these sites is unknown. It is a strict folivore that feeds on a relatively small number of food plants (Chiarello, 2008). Chiarello (1998) found that leaves from 21 species formed 99% of the diet of three animals. Like other congeneric sloths, animals descend from trees periodically to urinate and defecate. The females give birth to one young per year, predominantly at the end of the wet season and beginning of the dry season (February-April), and copulation concentrates in the late dry and early wet seasons (August-October; Dias *et al.*, 2009). Sexual maturity is probably reached between the second and third year and longevity in the wild is over 12 years (Lara-Ruiz and Chiarello, 2005).

Threats: The rate of deforestation in the Atlantic forest of eastern Brazil has decreased dramatically in the last three decades but has not stopped (Ribeiro *et al.*, 2009), so the pressure on habitat continues. In southern Bahia the economic crisis of the cocoa plantation (*Theobroma cacao*) puts a pressure on farmers of this product to clear their forest to make room for other economic alternatives, mainly pastures. In other areas, native forests are cleared for other reasons, including coal production, agriculture and city sprawl. The genetic integrity of distinct populations is threatened by the release of confiscated animals at different sites without knowledge or understanding of their origins. Additional threats include subsistence hunting and accidental mortality of *B. torquatus* on roads. Sloths attract the attention when spotted and might be killed just for the sake of curiosity. Although the species is not actively pursued by hunters, individuals might sometimes fall victims of subsistence hunting when spotted by local people. Although hunting is legally forbidden in Brazil, enforcement is ineffective and practically inexistent.

Conservation: *B. torquatus* is present in a number of protected areas, such as the Biological Reserves of Una (Bahia), Augusto Ruschi (Espírito Santo) and Poço das Antas (Rio de Janeiro), among others. The low genetic diversity within fragmented populations indicates a need to develop corridors of suitable habitat between these populations. Confiscated animals should be genetically characterized to determine the most appropriate release site. Data on dispersal ability, sex ratio, mating system, and population density are virtually unknown but important for conservation planning and monitoring. The species has been successfully translocated (Chiarello *et al.*, 2004). Awareness programs are in place in Espírito Santo, Brazil.

Assessors: Chiarello, A. and Moraes-Barros, N.

Evaluators: Hayssen, V. and Abba, A.M.

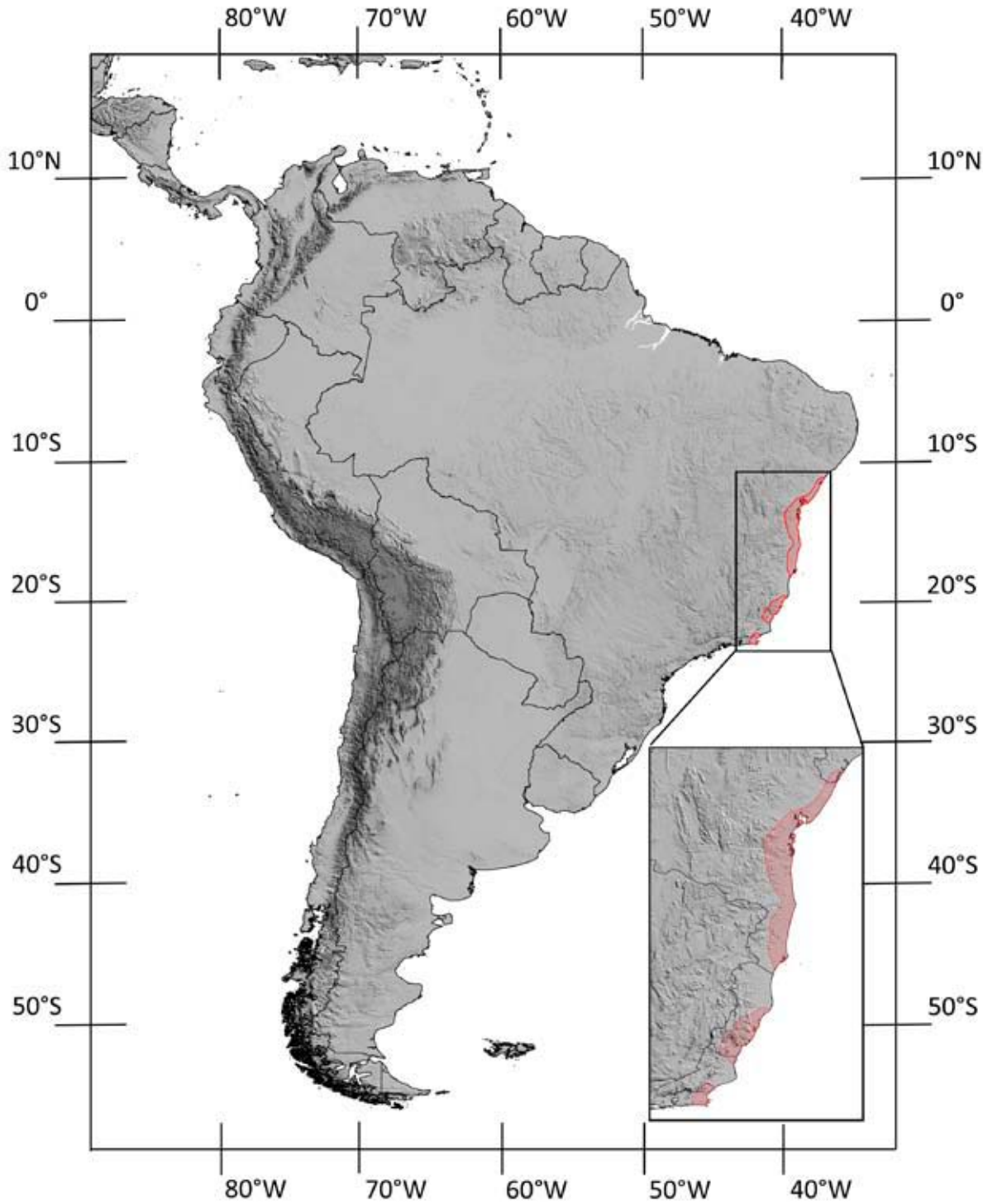

Figure 4. *Bradypus torquatus.* Based on Wetzel (1982); Emmons and Feer (1997); Eisenberg and Redford (1999); Gardner (2007); Aguiar and Fonseca (2008); Chagas *et al.* (2009); Hayssen (2009a); Boffy *et al.* (2010); Hirsch and Chiarello (in press); A. Chiarello, pers. comm. (2010).

Bradypus tridactylus

Least Concern (LC)

Photograph: Monique Pool

Common Names: Pale-throated three-toed sloth (English), pale-throated sloth (English), perezoso de tres dedos (Spanish), preguiça (Portuguese), preguiça-de-bentinho (Portuguese), preguiça-do-norte (Portuguese), ai (Portuguese).

Assessment Rationale: *B. tridactylus* is listed as Least Concern in view of its wide distribution in one of the most pristine areas of the Amazon basin, and its having been recorded as locally relatively abundant.

Geographic Range: *B. tridactylus* occurs in the Guyana Shield region, from Venezuela south of the Orinoco (although its distribution crosses at the delta region) into northern Brazil (south to the Amazonas/Solimões), through to Guyana, Suriname and French Guiana (Fig. 5). It does not occur south of the Amazon River. Its extent of occurrence is estimated at 1,000,000 km^2.

Population: Population density estimates vary from 1.7 animals per km^2 in French Guiana (Taube *et al.,* 1999) to 2.21 animals per hectare (or 221 animals per km^2) in Manaus, Brazil (Chiarello, 2008).

Habitats and Ecology: *B. tridactylus* is found in lowland and montane tropical moist forest. It has been recorded on "tepuis" (table-top mountains). The head and throat of adult sloths are yellowish to white and contrast with the grayish body that bears white spots. Males can be distinguished from females by their dorsal orange-yellow patch with a broad black central line (Hayssen, 2009b). Both males and females reach reproductive age at three to six years. A single young is born after a gestation of six months (Taube *et al.*, 2001; Gilmore *et al.*, 2008).

Threats: There are no major threats to this sloth species.

Conservation: *B. tridactylus* has been recorded from many protected areas.

Assessors: Chiarello, A. and Moraes-Barros, N.

Evaluators: Superina, M. and Abba, A.M.

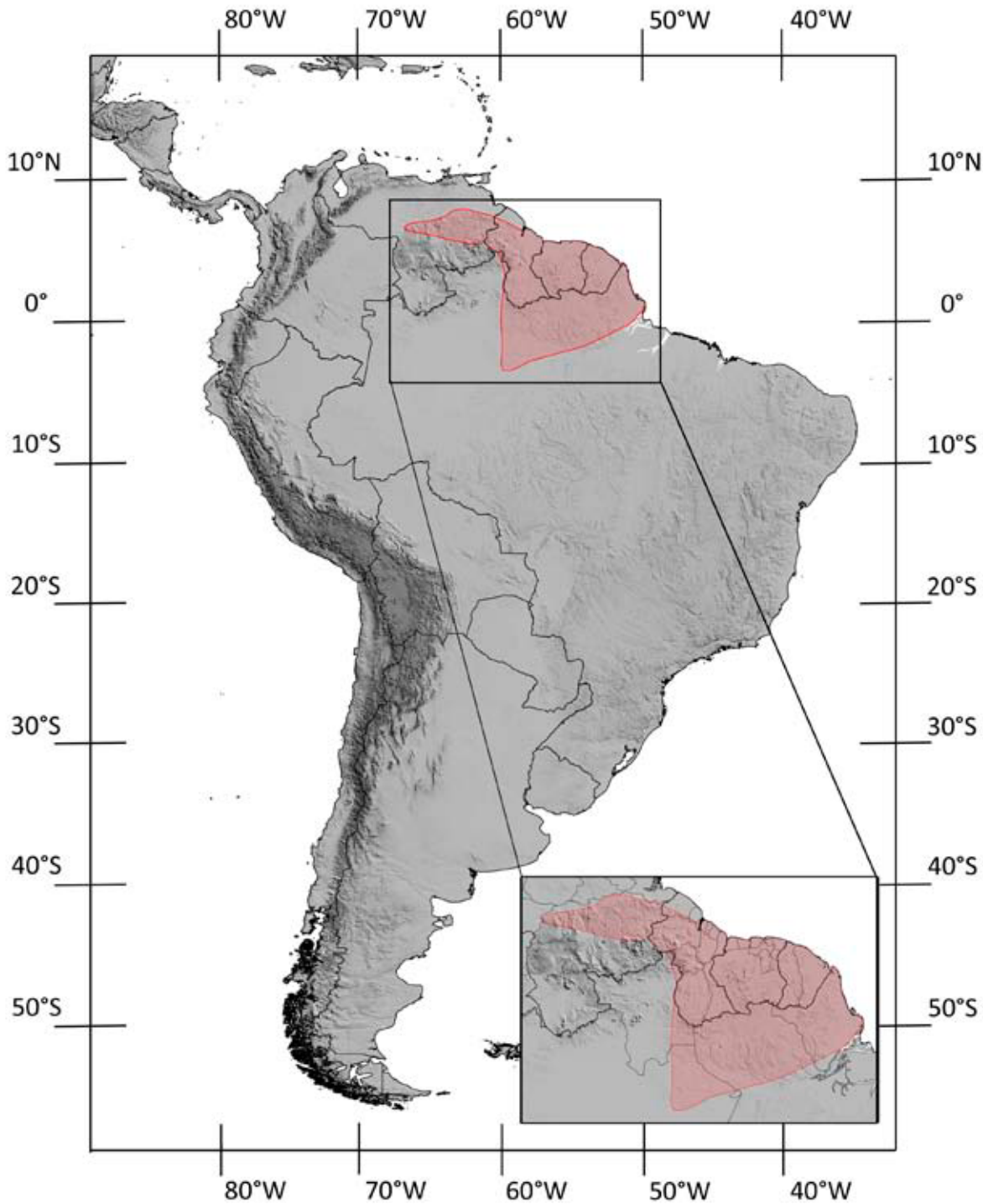

Figure 5. *Bradypus tridactylus.* Based on Wetzel (1982); Emmons and Feer (1997); Eisenberg and Redford (1999); Taube *et al.* (1999); Engstrom and Lim (2000); Gardner (2007); Aguiar and Fonseca (2008); Hayssen (2009b); Moraes-Barros *et al.* (2010); N. Moraes-Barros, pers. comm. (2009).

Bradypus variegatus

Least Concern (LC)

Photograph: Simonne Schinem

Common Names: Brown-throated three-toed sloth (English), brown-throated sloth (English), Bolivian three-toed sloth (English), perezoso tridáctilo (Spanish), perezoso bayo (Spanish), perezoso grisáceo (Spanish), guasa (Spanish), preguiça (Portuguese), preguiça-comum (Portuguese), bicho-preguiça (Portuguese), preguiça de óculos (Portuguese), ai (Portuguese), paresseux tridactyle (French), bradype (French), aï de Bolivie (French), paresseux tridactyle de Bolivie (French).

Assessment Rationale: *B. variegatus* is listed as Least Concern in view of its wide distribution including a large part of the Amazon forest, presumed large population, its occurrence in a number of protected areas, and because it is unlikely to be declining fast enough to qualify for listing in a threatened category.

Taxonomic Note: Seven subspecies are recognized according to Gardner (2007). Recent phylogeographic studies revealed that *B. variegatus* from the Central American, western Amazon and Atlantic forests constitute distinct and unique evolutionary units that are distinguishable by molecular and morphological traits (Moraes-Barros *et al.*, 2002, 2006, 2007).

Geographic Range: *B. variegatus* ranges from Honduras in the north, through southern Central America. In South America, it ranges from Colombia into western and southern Venezuela, and south into Ecuador, eastern Peru and Bolivia, into Brazil and northern Argentina (where it is probably extinct; Fig. 6). Its distribution overlaps with *B. torquatus* in the central part of the Atlantic forest (Hirsch and Chiarello, unpublished data). In Brazil, the species currently occurs in forested areas of the Amazon, Atlantic forest, and Cerrado biomes. There are historical records of *B. variegatus* in the Caatinga biome (Moraes-Barros, unpublished data). Its presence in the Pantanal biome of Brazil remains unconfirmed, but the species might occur in the contact zones between this biome and the Amazon forest to the north. Additional field studies are thus necessary in order to properly define the current species distribution in the Cerrado, Caatinga and Pantanal. The southernmost distribution of this sloth in Brazil was reported by Cabrera (1957) as the state of Rio Grande do Sul, which could, however, not be confirmed (Gardner, 2007). It is historically absent from the state of Santa Catarina (Brazil) and northeastern Argentina; the southernmost confirmed record of the species is near Londrina, in the state of Paraná, Brazil, but today it is considered extinct in this state (Mikich and Bernils, 2004). The last record from Argentina was collected in Jujuy province and dates back to 1916 (Vizcaíno *et al.*, 2006), but field studies specifically aiming at this species are lacking from this country. *B. variegatus* is found from sea level to at least 2,400 m asl (Ureña *et al.*, 1986). The extent of occurrence of this species amounts to approximately 10,000,000 km^2. Its area of occupancy

is declining; this is particularly true for the Brazilian Atlantic forest and the Colombian populations.

Population: Population densities of *B. variegatus* have been estimated at 2.2 to 6.7 animals per hectare in the Brazilian Amazon (Queiroz, 1995), 8.5 animals per hectare in Panama (Montgomery and Sunquist, 1975), and 0.6 to 4.5 animals per hectare in the tropical dry forest of Colombia (Acevedo and Sanchez, 2007). No demographic information is available from the remaining area of distribution. *B. variegatus* is commonly found in public squares, where densities can reach 12.5 animals per hectare (Manchester and Jorge, 2009). Severe fragmentation has been reported from the populations in Colombia and from the eastern Brazilian subspecies *B. v. brasiliensis*, which presents the lowest levels of genetic diversity among all *B. variegatus*. The genetic diversity is only comparable to that observed in the Critically Endangered pygmy sloth (*B. pygmaeus*). Molecular studies also indicate that genetic diversity in the northern Atlantic forest subspecies *B. v. variegatus* is lower than values observed for sympatric populations of *B. torquatus* (Moraes-Barros *et al.,* 2006).

Habitats and Ecology: The brown-throated three-toed sloth has been recorded from a number of forest types, including seasonal mesic tropical forest, semi-deciduous forest (inland Atlantic forest), cloud forest, and lowland tropical forest. It inhabits cacao plantations in Costa Rica (Vaughan *et al*., 2007). This sloth species produces one litter of one infant at intervals of at least 19 months (Bezerra *et al*., 2008; T. Plese, pers. comm., 2010). Mating period varies depending on the year and geographical region, but occurs mainly in spring (*i.e*., from July to November in South America and from February to May in Central America).

Threats: It appears that there are no major threats to *B. variegatus* at the global level. Nevertheless, some populations, especially in Colombia and Brazil, are declining due to deforestation leading to severe habitat degradation and fragmentation. Furthermore, they are hunted by local indigenous communities. In Brazil, especially in the northeastern region and in the Amazon, and in Colombia the common sloth is hunted and sold in public markets as food, medicine, and as a pet species. In several touristic sites, *B. variegatus* is used by locals to entertain visitors. Wild-caught individuals, especially offspring, are sold as pets to tourists in Colombia (Moreno and Plese, 2006). This illegal trade is increasing and represents a cause of concern due to its impact on the wild populations.

Conservation: *B. variegatus* is present in many protected areas. It is included in CITES Appendix II. Education and awareness programs are being carried out by Fundación Unau in Colombia.

Assessors: Chiarello, A., Plese, T. and Moraes-Barros, N.

Evaluators: Superina, M. and Abba, A.M.

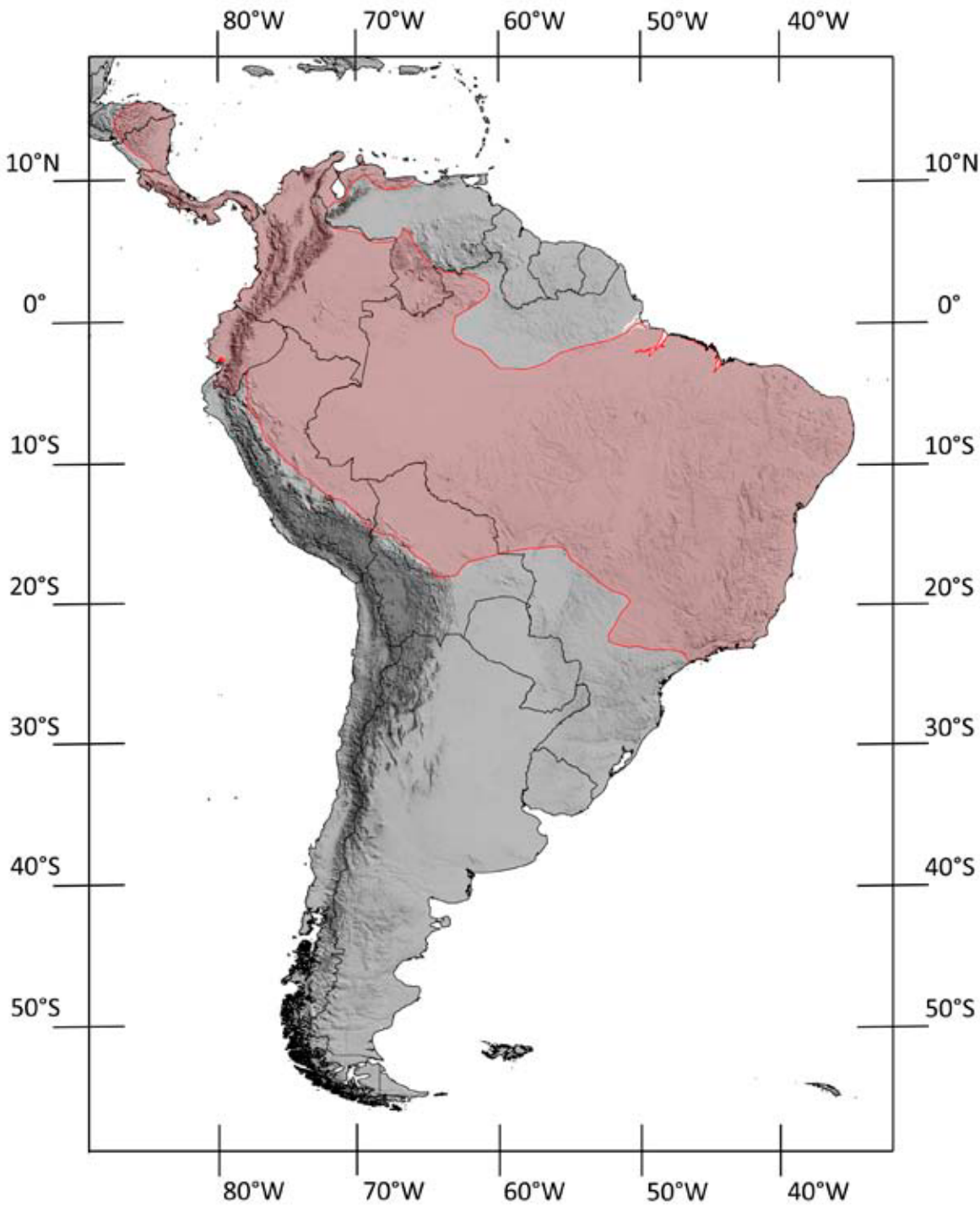

Figure 6. *Bradypus variegatus*. Based on Hall (1981); Ureña *et al.* (1986); Eisenberg (1989); Redford and Eisenberg (1992); Pacheco *et al.* (1995); Emmons and Feer (1997); Reid (1997); Eisenberg and Redford (1999); Lord (2000); Cáceres (2004); Mikich and Bernils (2004); Moreno and Plese (2005); Medri *et al.* (2006); Gardner (2007); Tirira (2007); Aguiar and Fonseca (2008); Romero *et al.* (2008); Hayssen (2010); Moraes-Barros *et al.* (2010); Í. M. Medri, pers. comm. (2009); N. Moraes-Barros, pers. comm. (2009); T. Plese, pers. comm. (2009).

Choloepus didactylus

Least Concern (LC)

Photograph: John A. Nyakatura

Common Names: Southern two-toed Sloth (English), Linné's two-toed sloth (English), perezoso de dos dedos (Spanish), perico ligero (Spanish), preguiça-real (Portuguese), unau (Portuguese).

Assessment Rationale: *C. didactylus* is listed as Least Concern in view of its wide distribution, presumed large population, its occurrence in a number of protected areas, and because it is unlikely to be declining fast enough to qualify for listing in a threatened category.

Geographic Range: The southern two-toed sloth ranges through Venezuela (the delta and south of the Río Orinoco) and the Guianas (French Guiana, Guyana, and Suriname) south into Brazil (Maranhão state west along the Rio Amazonas/Solimões) and west into the upper Amazon Basin of Ecuador and Peru (Fig. 7). Its southern limit in the western Amazon of Brazil is unclear. It occurs in the southern departments of Colombia, with its northern limit being the departments of Meta and Guainía. It ranges from sea level up to 2,438 m asl (Britton, 1941). The extent of occurrence of this sloth is approximately 4,200,000 km^2.

Population: In Suriname, *C. didactylus* has been found at densities of 0.9 animals per hectare (Taube *et al.,* 1999). In the Brazilian Amazon, estimated densities range from 0.13 individuals per hectare (Manaus region) to 0.88 animals per hectare in the flooded forests (Mamirauá Reserve; Queiroz, 1995; Chiarello, 2008).

Habitats and Ecology: This sloth species is found in tropical moist lowland and montane forest. Two-toed sloths have nocturnal and solitary habits. Gestation length seems to be approximately ten months (Eisenberg and Maliniak, 1985) but estimates are quite variable. Males and females reach sexual maturity at approximately two years of age. Longevity in captive conditions is at least 18 years.

Threats: There are no major threats to *C. didactylus*. Because they are usually found high in the canopy, motionless and virtually invisible, they are not as commonly hunted as armadillos or tamanduas, and there are taboos against their consumption by some native groups. They are probably hunted opportunistically, but there is no serious bushmeat trade.

Conservation: *C. didactylus* is present in many protected areas.

Assessors: Plese, T. and Chiarello, A.

Evaluators: Abba, A.M. and Superina, M.

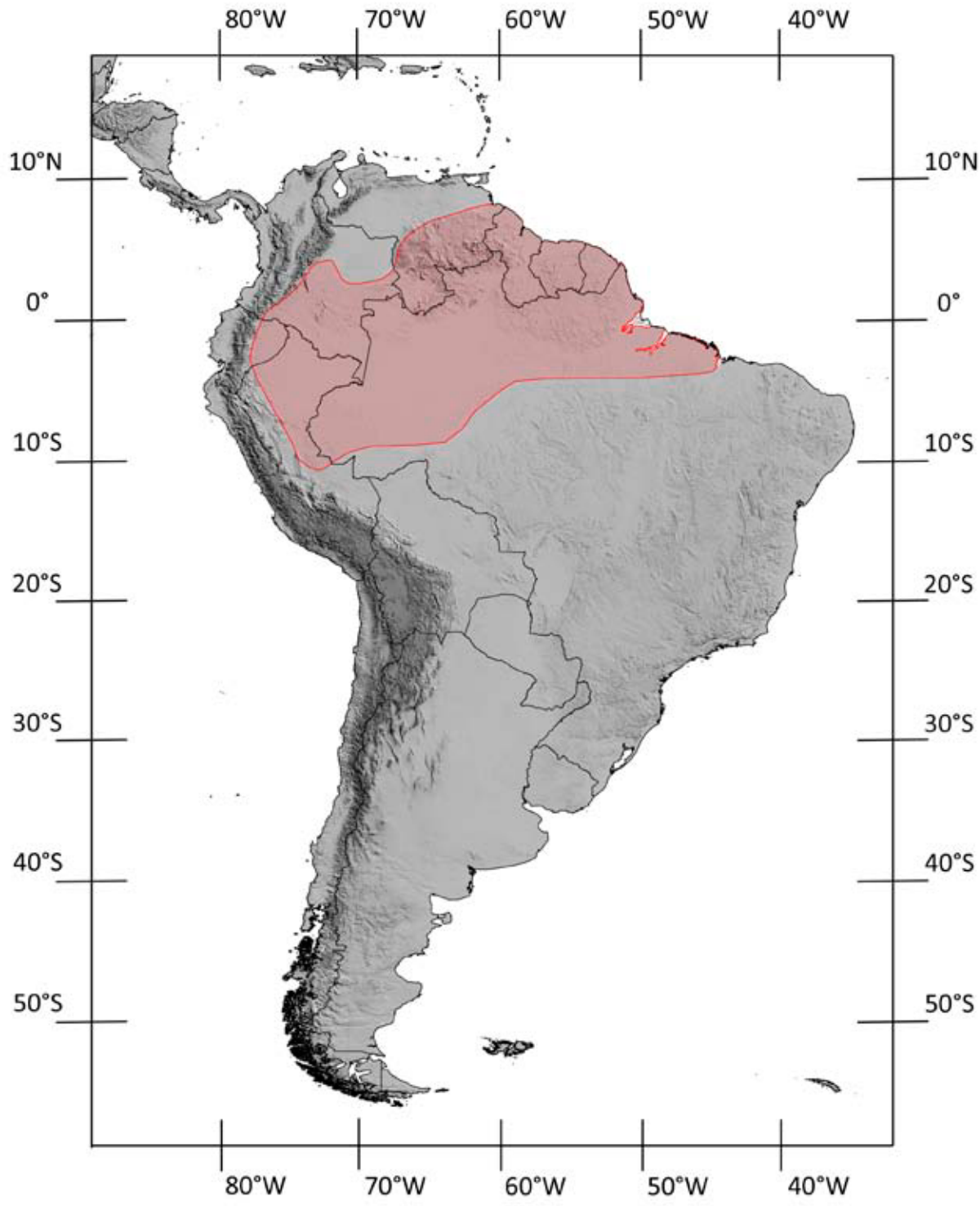

Figure 7. *Choloepus didactylus*. Based on Hall (1981); Pacheco *et al.* (1995); Emmons and Feer (1997); Adam (1999); Engstrom and Lim (2000); Gardner (2007); Tirira (2007); Aguiar and Fonseca (2008).

Choloepus hoffmanni

Least Concern (LC)

Photograph: Fundación Unau

Common Names: Hoffmann's two-toed sloth (English), perezoso (Spanish), perico ligero (Spanish), unau (Spanish), unau d'Hoffmann (French).

Assessment Rationale: *C. hoffmanni* is listed as Least Concern in view of its wide distribution, presumed large population, its occurrence in a number of protected areas, its tolerance of a degree of habitat modification, and because it is unlikely to be declining fast enough to qualify for listing in a threatened category. However, because of ongoing deforestation, the northern population (nominate subspecies) of this species could potentially be assessed as Near Threatened.

Taxonomic Note: Five subspecies are recognized by Gardner (2007).

Geographic Range: *C. hoffmanni* has two disjunct populations. The northernmost population ranges from Nicaragua south into western Venezuela. The southern population is found from north-central Peru through extreme western Brazil (south-western Amazonas and probably Acre states) to central Bolivia (Fig. 8). There is a doubtful, outlying record for this species from the Rio Aripuanã, Mato Grosso state, Brazil (Fonseca and Aguiar, 2004). Its range within Brazil is unclear, and further surveys are needed. This species ranges from sea level to 3,300 m asl in Costa Rica; up to 1,925 m asl in Panama; and up to 1,150 m asl in the southern Andes of Venezuela. In Colombia, the species is found in the biogeographical regions of the Andean zone, Caribbean and Chocó, more specifically in the departments of Cauca, Chocó, Cundinamarca, Nariño, Quindío, Sucre, Valle del Cauca, and Santanderes from sea level up to 3,000 m asl (Alberico *et al*., 2000; Moreno, 2003; Acevedo and Sanchez, 2007). Its extent of occurrence is approximately 1,600,000 km^2.

Population: This two-toed sloth occurs at densities of 1.05 animals per hectare on Barro Colorado Island, Panama (Montgomery and Sunquist, 1975). It has been found at densities of 0.3 to 1.5 animals per hectare in the Andean region of Colombia, while densities in the lowlands of northern Colombia were 0.2 to 0.83 individuals per hectare (Alvarez, 2004; Acevedo and Sanchez, 2007) and only 0.079 sloths per hectare in the natural reserve "La Montaña del Ocaso", Quindío, Colombia (Aguilar-Isaza and López-Obando, 2009).

Habitats and Ecology: *C. hoffmanni* is found in lowland and montane tropical forest, both deciduous and mixed-deciduous. In Central America, it occurs in evergreen and semi-deciduous tropical moist forest

as well as in secondary forest, but it is rare or absent in lowland dry forest. In Costa Rica, it is able to use cocoa plantations as habitat and frequently ventures into relatively open pastures in search of isolated feeding trees (Vaughan *et al*., 2007). It can also occur in dry grassland with thorny shrubs and trees (Nicaragua; Genoways and Timm, 2003). These sloths are rather solitary. Their herbivore-omnivore diet consists mainly of leaves, fruits and sap of some trees. Both genders reach reproductive maturity at three years of age. Gestation length is approximately 11 months.

Threats: It appears that there are no major threats to *C. hoffmanni* at the global level. Nevertheless, populations in the northwestern part of its range, especially in Colombia and Central America, are declining due to severe habitat degradation and fragmentation. Furthermore, they are hunted by indigenous communities. Wild-caught individuals, especially offspring, are sold as pets to tourists in Colombia (Moreno and Plese, 2006). This illegal trade is increasing and represents a cause of concern due to its impact on the wild populations.

Conservation: *C. hoffmanni* is present in many protected areas. It is included in CITES Appendix III for Costa Rica (CITES, 2009). Further research is needed to establish whether there are taxonomic differences between the two disjunct populations. Ongoing education and awareness programs are carried out by Fundación Unau in Colombia.

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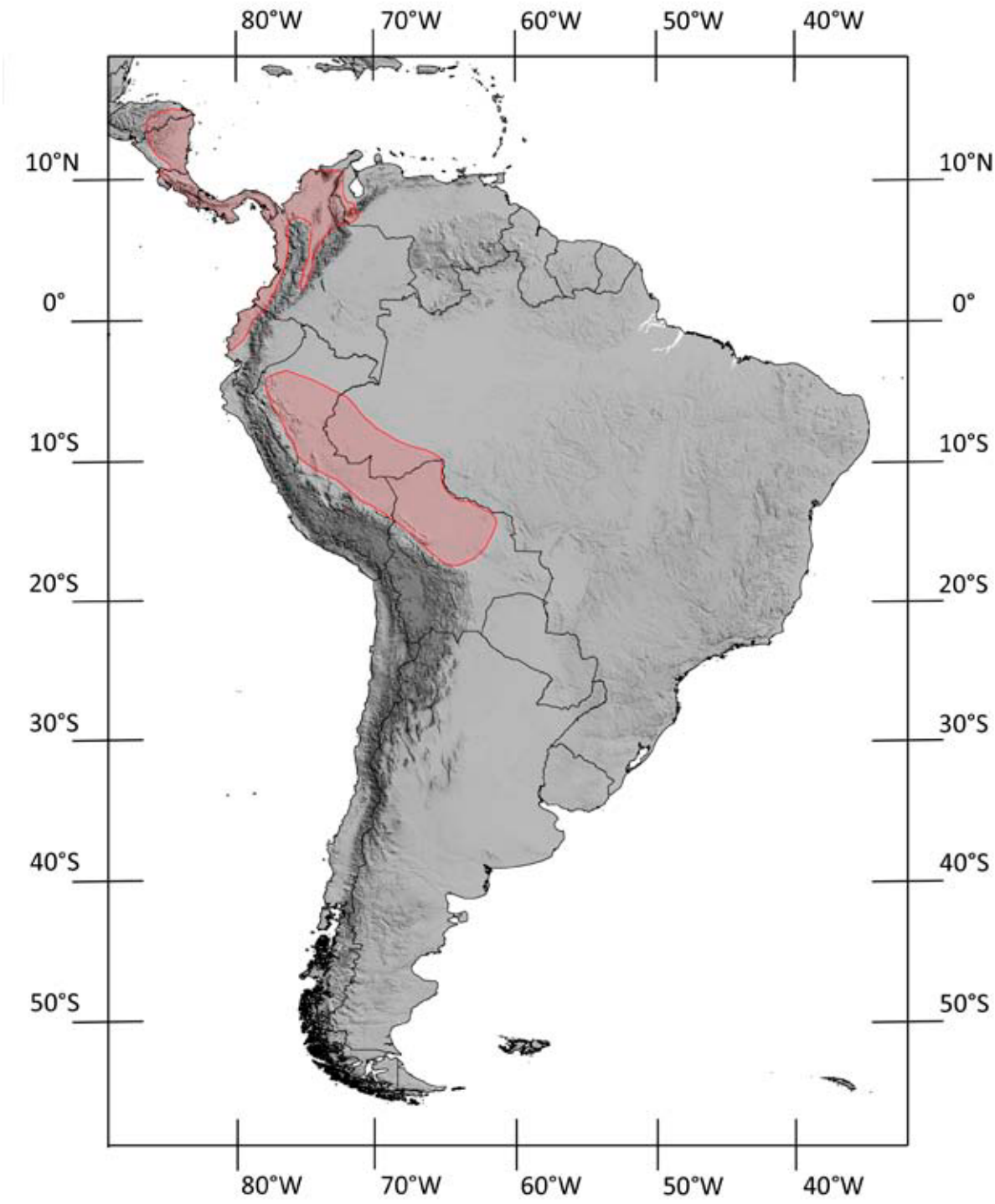

Figure 8. *Choloepus hoffmanni*. Based on Wetzel (1982); Eisenberg (1989); Salazar Bravo *et al.* (1990); Pacheco *et al.* (1995); Anderson (1997); Emmons and Feer (1997); Reid (1997); Eisenberg and Redford (1999); Alberico *et al.* (2000); Genoways and Timm (2003); Moreno (2003); Acevedo and Sanchez (2007); Gardner (2007); Tirira (2007); Aguiar and Fonseca (2008).

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