The 2009/2010 Armadillo Red List Assessment

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The 2009/2010 Armadillo Red List Assessment

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Abstract

The conservation status of the 21 extant armadillo species was re-assessed by specialists of the IUCN/SSC Anteater, Sloth and Armadillo Specialist Group between December 2009 and May 2010. Information on their geographic range, population size and status, habitat and ecology, threats, and existing conservation measures was collected from the literature and personal communications. Four armadillo species were classified as Vulnerable, four as Near Threatened, and four were categorized as Data Deficient. Less than half of all armadillo species were listed as Least Concern. Virtually all assessed species are affected by hunting as well as habitat fragmentation and degradation. The populations of only two species are thought to be increasing, while those of at least seven species are in decline. Much work is still needed to ensure the long-term survival of all species. Most armadillo species occur in at least one protected area, but other conservation actions are scarce.

Keywords: Conservation status, threats, Dasypodidae, Cingulata, Xenarthra

The IUCN/SSC Anteater, Sloth and Armadillo Specialist Group re-assessed the conservation status of the 21 extant armadillo species between December 2009 and May 2010. Version 3.1 of the IUCN Red List Categories and Criteria (IUCN, 2001) was used in all cases. Information on their geographic range, population size and status, habitat and ecology, threats, and existing conservation measures was collected from the literature and personal communications. In total, 30 researchers provided data for the 2009/2010 Armadillo Red List Assessment and checked all evaluations for consistency.

As in the 2004 assessment (Fonseca and Aguiar, 2004), four armadillo species are considered Vulnerable (VU), but the reasons for their classification as such has slightly changed (see species descriptions). The two fairy armadillos (*Chlamyphorus truncatus* and *Calyptophractus retusus*) were listed as Near Threatened (NT) in previous assessments (Table 1); their status has been changed to Data Deficient (DD) due to the lack of basic information on their ecology, range, and threats. As a consequence, four instead of six species are currently categorized as Near Threatened, and four are classified as Data Deficient.

Less than half of all armadillo species (43%) are considered Least Concern (LC; Fig. 1). This situation may worsen in the future, as virtually all assessed species are affected by hunting as well as habitat fragmentation and degradation (Fig. 2). Only four species do not seem to be affected by any threat type, while the factors affecting the long-term survival of two species (*Cabassous centralis* and *Dasypus yepesi*) could not be identified. It is possible that persecution by dogs and cats is affecting more species than *Chlamyphorus truncatus* and *Dasypus hybridus* (Fig. 2), but field data to confirm this are lacking.

The populations of only two species, *Dasypus novemcinctus* and *Chaetophractus villosus*, are thought to be increasing, while those of at least seven species are in decline (Table 1). Population trends for over half of all armadillo species remain unknown, underlining the importance of long-term field studies on these mammals. But not only data on population trends are lacking — we are in dire need of basic information on the natural history, threats, harvest levels (for hunted species), and even the taxonomy of many armadillo species (Fig. 3).

An evaluation of existing conservation measures for armadillos reveals that much work is still needed to ensure the long-term survival of all species. Four species are included in the CITES Appendices: *Priodontes maximus* is listed in Appendix I, *Chaetophractus*

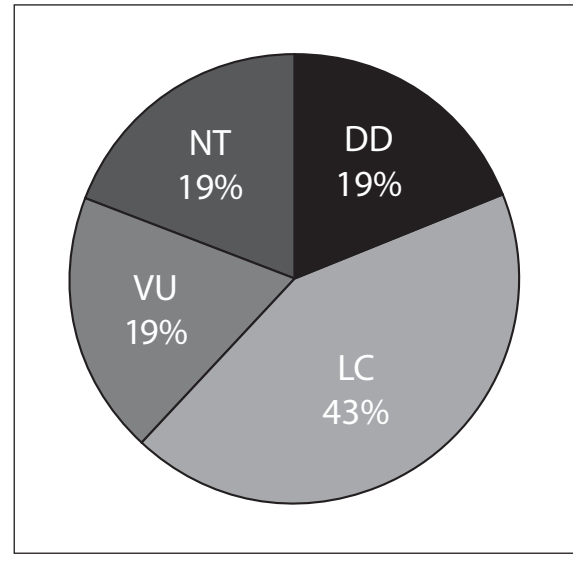

Figure 1. Percentages of species in each Red List category, according to the 2009/2010 Armadillo Red List Assessment.

nationi in Appendix II, while the Costa Rican and Uruguayan populations of *Cabassous centralis* and *Cabassous tatouay*, respectively, are listed in Appendix III (CITES, 2009). Virtually all armadillo species occur in at least one protected area, but other conservation actions are scarce (Fig. 4). No action recovery, harvest management, area-based management plans, or reintroduction programs exist for any species.

We thank all researchers, graduate students, rangers, and enthusiasts who participated in the 2009/2010 Armadillo Red List Assessment. Detailed species descriptions and updated range maps can be found in the following pages.

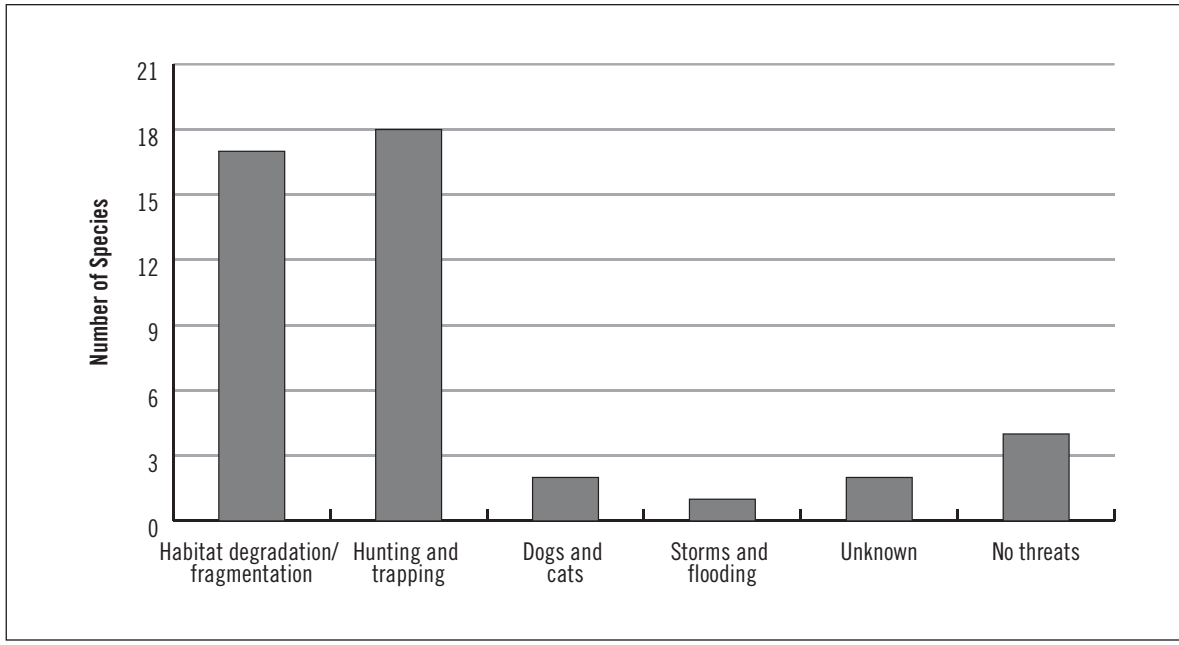

Figure 2. Main threats affecting wild armadillos.

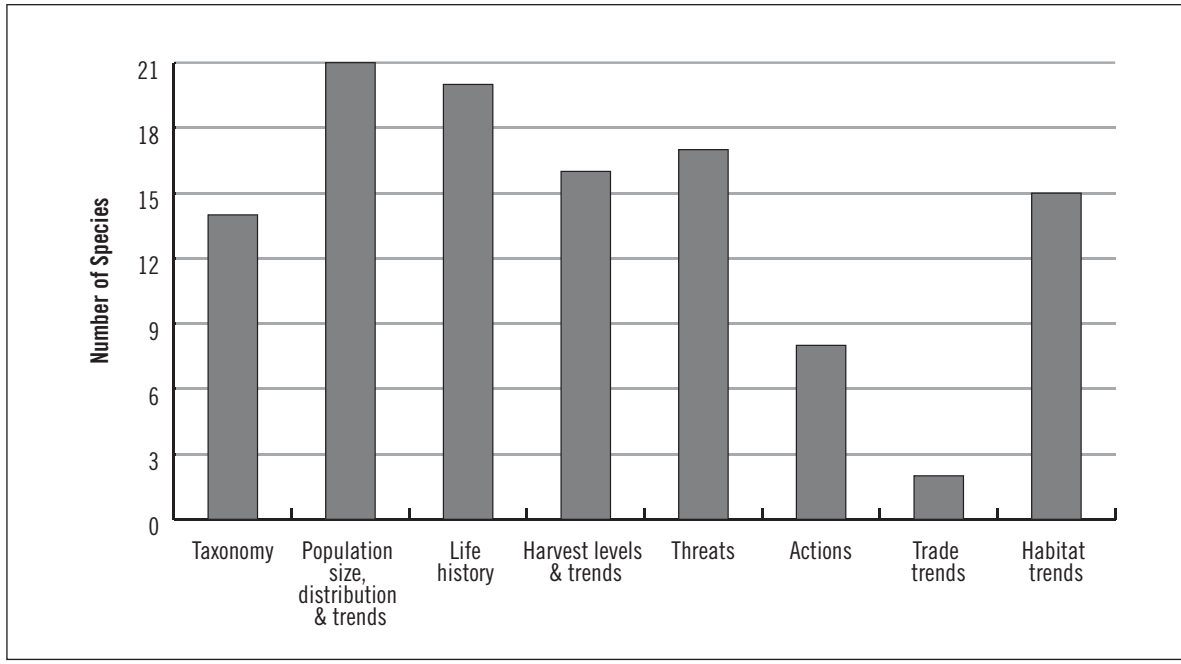

Figure 3. Research priorities for armadillos.

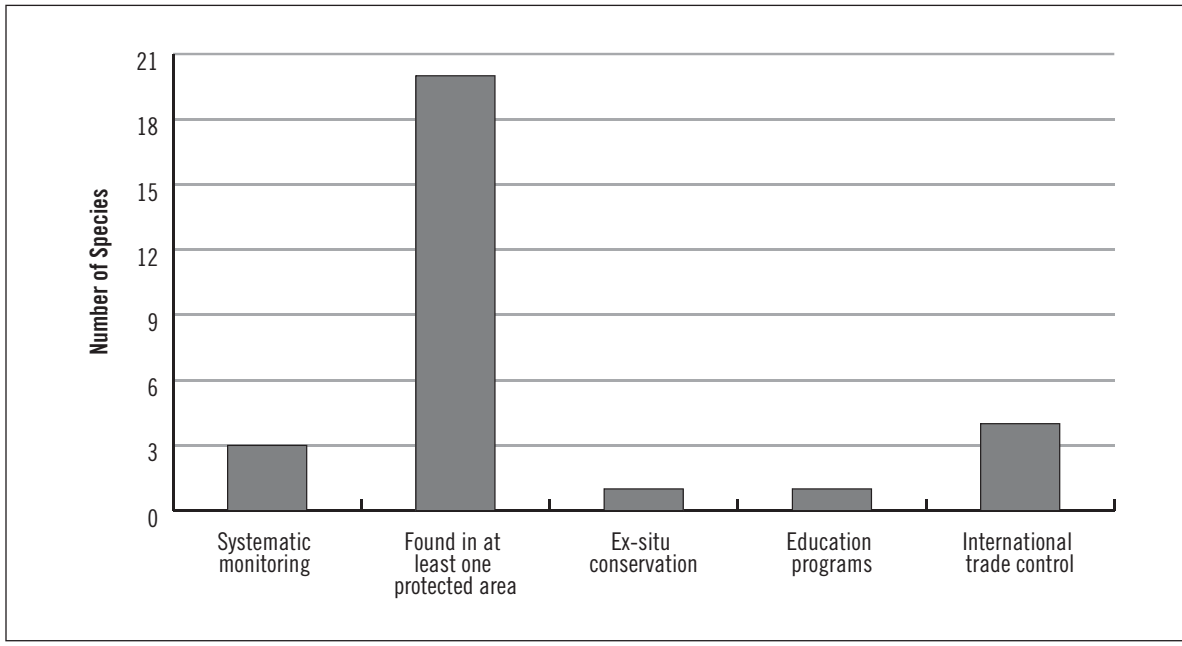

Figure 4. Existing conservation actions for armadillos.

TABLE 1. Historical overview of the Red List categories and current population trends of the 21 extant armadillo species. See glossary for definitions of the categories.

Species	1996	2004	2009/2010	Population trend
Cabassous centralis	**DD**	**DD**	**DD**	**?**
Cabassous chacoensis	**DD**	**NT**	**NT**	**?**
Cabassous tatouay	**LR/nt**	**LC**	**LC**	**?**
Cabassous unicinctus	**LR/lc**	**LC**	**LC**	**?**
Calyptophractus retusus	**VU** A1c	**NT**	**DD**	**?**
Chaetophractus nationi	**VU** A1d	**VU** A2d	**VU** A2acd	↓
Chaetophractus vellerosus	**LR/lc**	**LC**	**LC**	=
Chaetophractus villosus	**LR/lc**	**LC**	**LC**	↑
Chlamyphorus truncatus	**EN** A1abcd	**NT**	**DD**	↓
Dasypus hybridus	**LR/lc**	**NT**	**NT**	↓
Dasypus kappleri	**LR/lc**	**LC**	**LC**	**?**
Dasypus novemcinctus	**LR/lc**	**LC**	**LC**	↑
Dasypus pilosus	**VU** B1+2c	**VU** B1ab(iii)	**VU** B2ab(iii)	**?**
Dasypus sabanicola	**DD**	**LC**	**LC**	**?**
Dasypus septemcinctus	**LR/lc**	**LC**	**LC**	**?**
Dasypus yepesi	–	**DD**	**DD**	**?**
Euphractus sexcinctus	**LR/lc**	**LC**	**LC**	=
Priodontes maximus	**EN** A1cd	**VU** A2cd	**VU** A2cd	↓
Tolypeutes matacus	**LR/nt**	**NT**	**NT**	↓
Tolypeutes tricinctus	**VU** A1bcd	**VU** A2bc	**VU** A2cd	↓
Zaedyus pichiy	**DD**	**NT**	**NT**	↓

Cabassous centralis

Data Deficient (DD)

Photograph: Carlos Delgado, www.aburranatural.org

Common Names: Northern naked-tailed armadillo (English), tatú de rabo molle (Spanish), armadillo zopilote (Spanish), armadillo de cola desnuda de Centro América (Spanish), armadillo cola de trapo (Spanish), armadillo coletrapo centroamericano (Spanish).

Assessment Rationale: C. centralis is listed as Data Deficient due to limited knowledge on the current status of extant populations and a lack of information on the impacts of habitat loss and other threats. Habitat destruction is, however, advancing at a fast pace throughout the range of *C. centralis*, which may soon justify its classification as Vulnerable under criterion A4c.

Taxonomic Note: The wide range of this species might be obscuring the presence of locally distributed forms that may constitute separate species.

Geographic Range: C. centralis ranges from Chiapas state in Mexico through Central America to western Colombia, north-western Ecuador and north-western Venezuela (Fig. 5). It occurs from sea level to around 3,000 m asl. The extent of occurrence is 780,000 km^2 but no information is available on the area of occupancy.

Population: C. centralis is apparently rare and patchily distributed. Individuals are not commonly seen or captured, which may be due to its secretive habits. The population trend is unknown.

Habitats and Ecology: C. centralis occurs in dry to moderately moist (mesic), deciduous and semi-deciduous forests, at forest edges in rocky terrain and in open habitats such as dry savanna (Reid, 1997). It has also been recorded in tropical moist montane forests, as well as in the subparamo of the Colombian Central Andean highlands (Díaz-N. and Sánchez-Giraldo, 2008). Deforestation rates are high in large parts of its range. This naked-tailed armadillo can be found in secondary forest habitat and also tolerates a moderate mix of forest and agricultural land. It is a solitary, insectivorous species that seems to be more fossorial than other armadillos.

Threats: The threats to this species are not known. Throughout most of its range, *C. centralis* is not hunted for food because of its pungent odor and local beliefs. The species is, however, indiscriminately hunted along its known Andean distribution. Some Andean populations are facing severe impacts due to urbanization of their natural habitat. *C. centralis* is distributed throughout the tropical dry forest, one of the most threatened habitats of northwestern South America, which in Colombia has been reduced to 1.5% of its original area (Etter, 1993). Although its sensitivity to habitat loss is not known and the species seems to tolerate some degree of habitat degradation, it is more common in primary, well-preserved forests. The severe habitat transformations are therefore likely to have a negative impact on the species.

Conservation: It has been recorded from a number of protected areas, such as Cotacachi-Cayapas Ecological Reserve, Mache-Chindul Ecological Reserve, Manglares Cayapas-Mataje Ecological Reserve and Bilsa Protected Forest in Ecuador. There is a need to determine the population status of the species throughout its range, as well as potential threats.

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

Evaluators: Tirira, D., Díaz-N., J.

Contributors: Tirira, D., Díaz-N., J. and Arteaga, M.C.

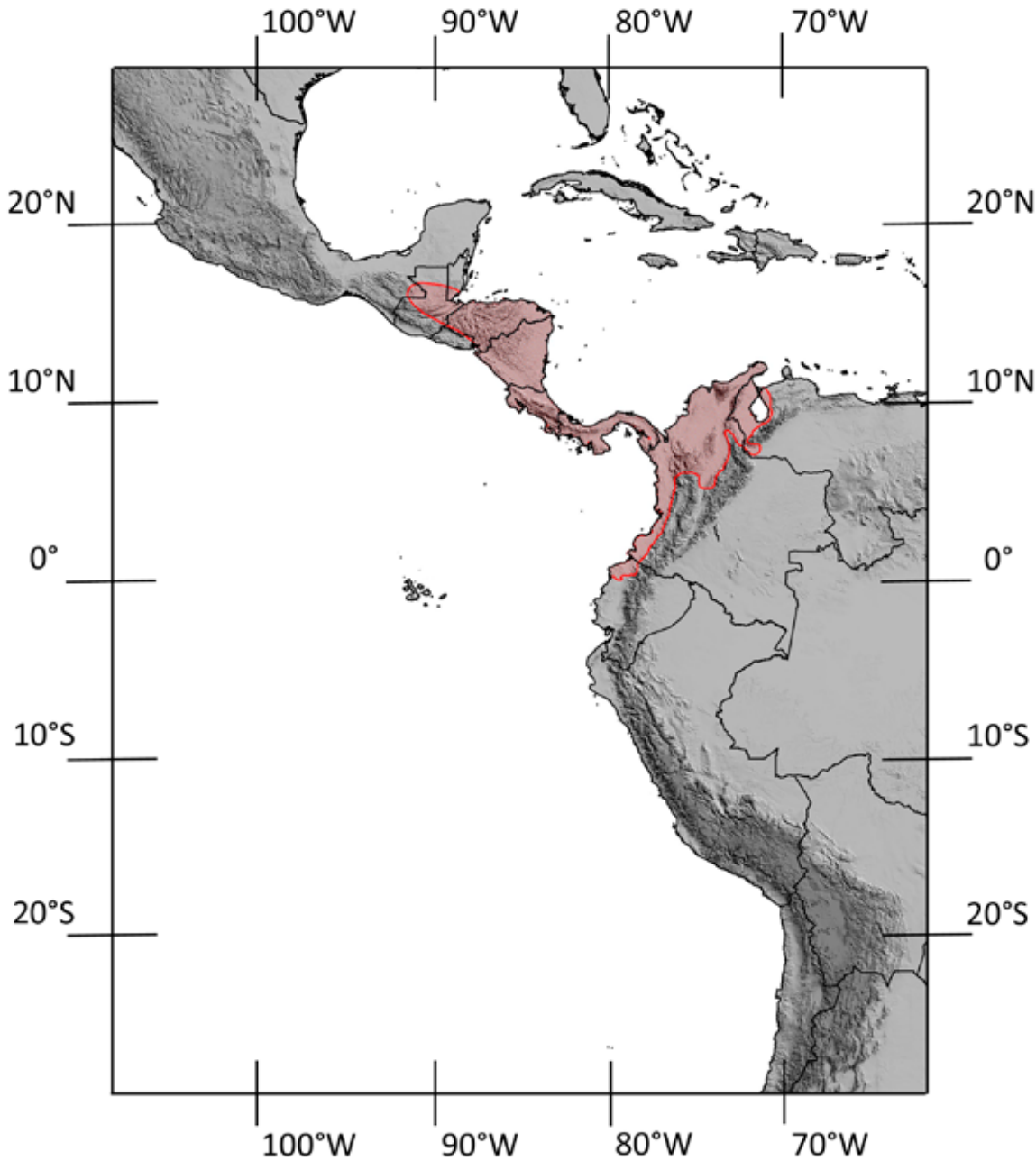

Figure 5. *Cabassous centralis.* Based on Wetzel (1982); Eisenberg (1989); Albuja (1991); Emmons and Feer (1997); Reid (1997); Cadena *et al.* (1998); Alberico *et al.* (2000); Ceballos and Oliva (2005); Gardner (2005); Tirira (2007); Aguiar and Fonseca (2008); Díaz-N. and Sánchez-Giraldo (2008).

Cabassous chacoensis

Near Threatened (NT)

Photograph: Jakob Unger

Common Names: Chacoan naked-tailed armadillo (English), cabasú chaqueño (Spanish), cabasú chico (Spanish).

Assessment Rationale: C. chacoensis is listed as Near Threatened given an inferred population decline of about 20–25% over the past 10 years that resulted from habitat loss and hunting. It almost qualifies as Threatened under criterion A2cd.

Taxonomic Note: This species was described by Wetzel in 1980.

Geographic Range: C. chacoensis has been recorded from the Gran Chaco of western Paraguay and central Argentina (Fig. 6). It has not been observed in Bolivia. The extent of occurrence is 438,000 km^2 but no information is available on its area of occupancy.

Population: The abundance of *C. chacoensis* is not known. In general, it is rarely sighted.

Habitats and Ecology: This largely fossorial species is restricted to chaco-seco (thorn forest) habitats (Meritt, 1985). It is not present in cultivated areas. There is little available information on the life history and other biological characteristics of *C. chacoensis*. Habitat degradation and fragmentation are advancing at a fast pace in the range of this species.

Threats: This species is threatened by habitat degradation from agricultural activity, subsistence hunting for food by local people, as well as predation by dogs.

Conservation: It has been recorded in several Argentinean national and provincial parks, such as Parque Nacional Copo, Río Pilcomayo, Formosa, and Talampaya, among others.

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

Evaluators: Rogel, T., Agüero, J. and Meritt Jr., D.A.

Contributors: Rogel, T. and Meritt Jr., D.A.

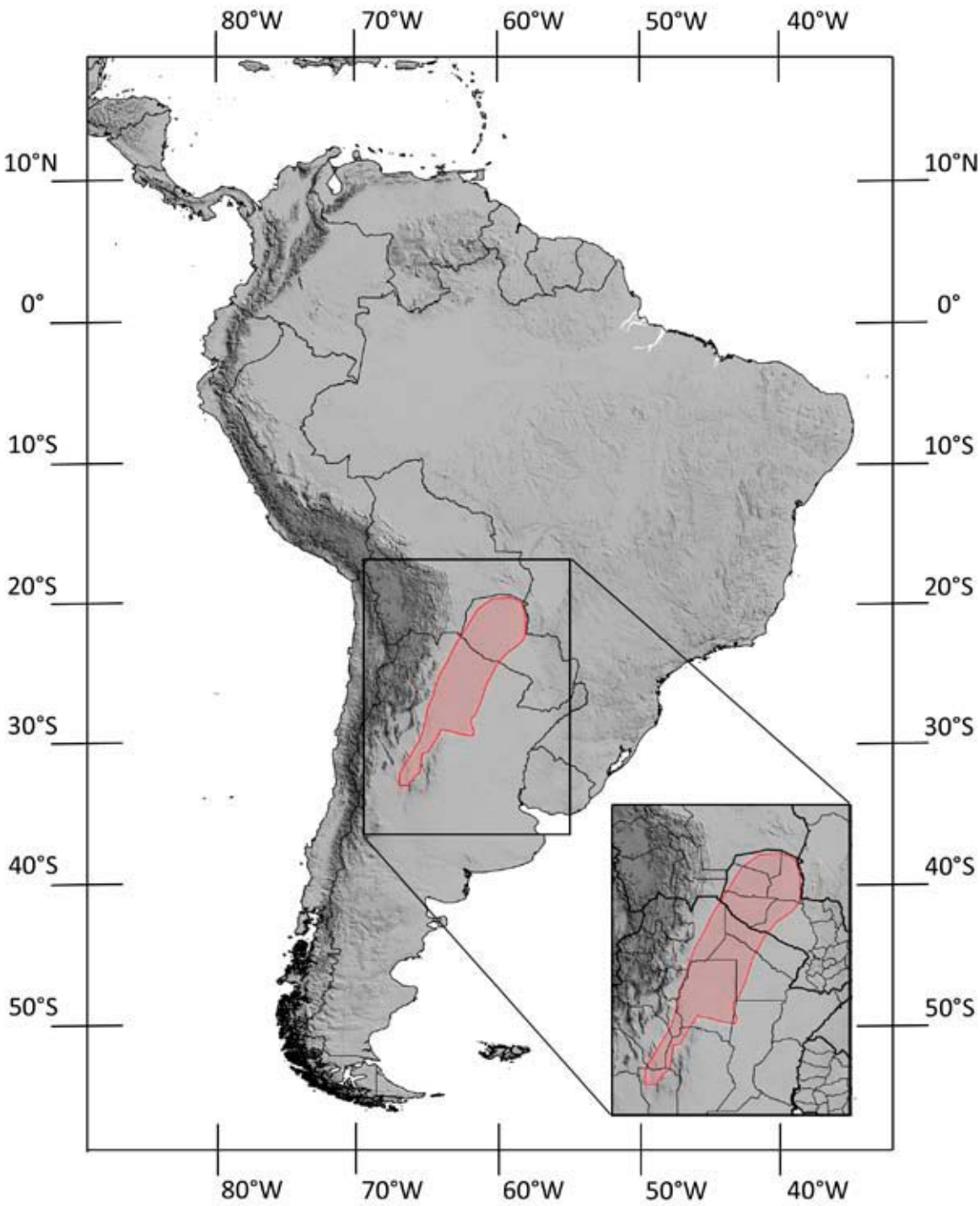

Figure 6. *Cabassous chacoensis*. Based on Wetzel (1982); Redford and Eisenberg (1992); Agüero *et al.* (2005); Gardner (2005); Vizcaíno *et al.* (2006); Abba and Vizcaíno (2008); Aguiar and Fonseca (2008); Nellar *et al.* (2008); Monguillot and Miatello (2009); Smith (2009); A. M. Abba, pers. comm. (2009); T. Rogel, pers. comm. (2009).

Cabassous tatouay

Least Concern (LC)

Photograph: Flávio Ubaid

Common Names: Greater naked-tailed armadillo (English), cabasú de orejas largas (Spanish), tatú de rabo molle (Spanish), tatu rabo-mole (Portuguese), tatou à queue nue (French).

Assessment Rationale: C. tatouay 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.

Taxonomic Note: Due to the overlapping range of different *Cabassous* species and the description of *C. chacoensis* only 30 years ago (Wetzel, 1980), it is possible that many specimens (especially historical records) of this genus are erroneously classified. The exact distribution and its conservation status therefore need to be revised once these specimens are correctly identified.

Geographic Range: This species is present in eastern and southern Brazil, north-eastern Uruguay, north-eastern Argentina and south-eastern Paraguay (Fig. 7). Records from Buenos Aires Province, Argentina, are erroneous (Abba and Vizcaíno, 2008). The extent of occurrence is 2,300,000 km^2 but no information is available on the area of occupancy.

Population: It is not uncommon and can be regularly encountered within suitable habitat.

Habitats and Ecology: C. tatouay inhabits tropical lowland and submontane forest, as well as open areas (Redford and Eisenberg, 1992). It is also found in agricultural areas and may occur in secondary forest (Mikich and Bernils, 2004; Aguiar and Fonseca, 2008). This naked-tailed armadillo is highly fossorial. Habitat degradation and fragmentation are advancing at a fast pace in the range of this species.

Threats: There is extensive habitat loss in much of its range, including in the Cerrado and Atlantic Forest. In addition, the species is hunted locally.

Conservation: C. tatouay is present in many protected areas.

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

Evaluators: Gonzalez, E. and Hernández, D.

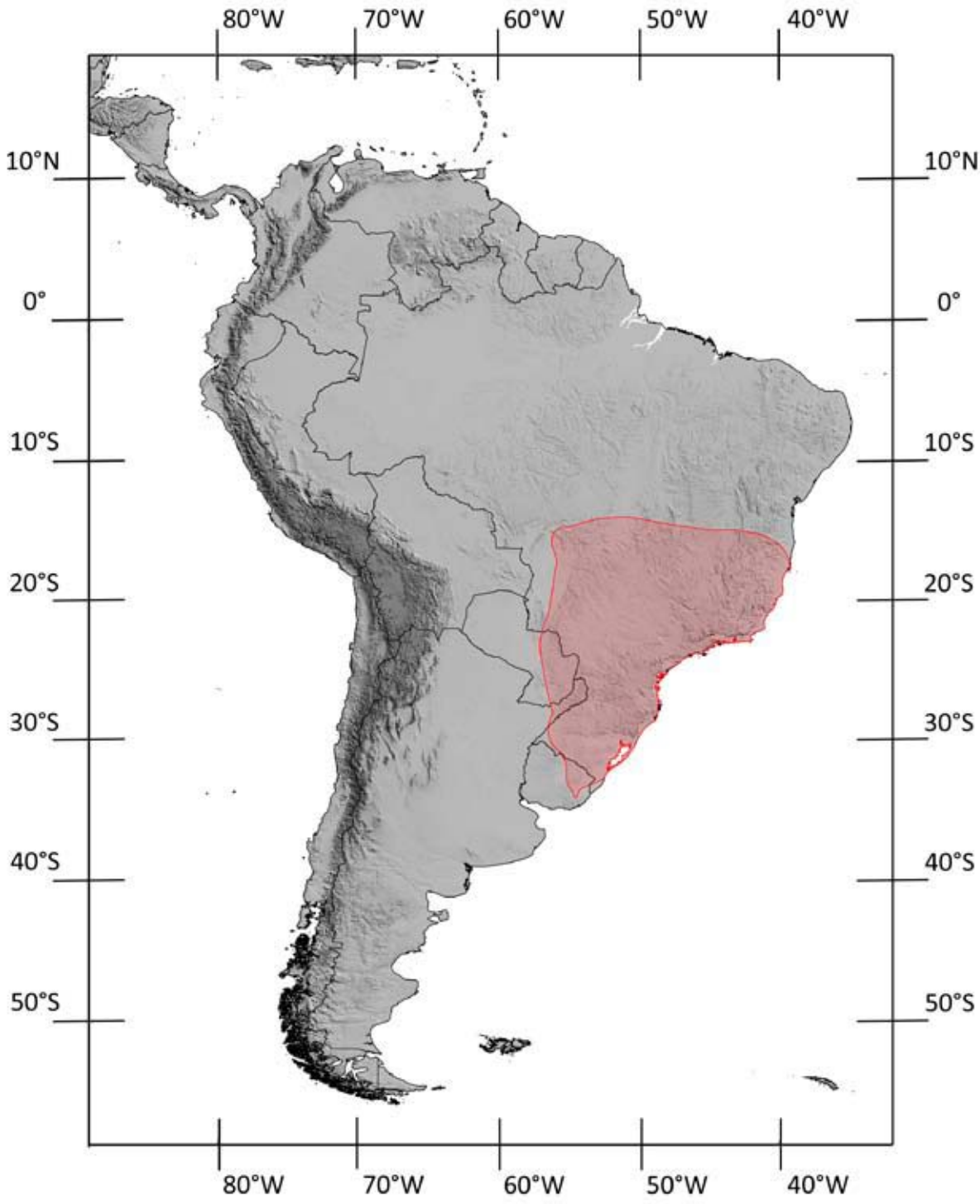

Figure 7. *Cabassous tatouay.* Based on Wetzel (1982); Redford and Eisenberg (1992); Eisenberg and Redford (1999); Cherem *et al.* (2004); Mikich and Bernils (2004); Gardner (2005); Vizcaíno *et al.* (2006); Abba and Vizcaíno (2008); Aguiar and Fonseca (2008); Smith (2009).

Cabassous unicinctus

Least Concern (LC)

Photograph: Thiago Maccarini

Common Names: Southern naked-tailed armadillo (English), cabasu (English), cabasú de orejas largas (Spanish), armadillo coletrapo amazónico (Spanish), tatu-de-rabo-mole (Portuguese).

Assessment Rationale: C. unicinctus 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.

Taxonomic Note: Two subspecies have been recognized (Wetzel, 1980). It is, however, possible that this taxon comprises more than one species, with the northern and southern populations representing separate species (E. Cuéllar, pers. comm., 2004).

Geographic Range: The southern naked-tailed armadillo is found east of the Andes from northern Colombia, Peru, Ecuador, Bolivia, through to Venezuela, Guyana, French Guiana and Suriname in the north, to the state of Mato Grosso do Sul (Brazil) in the south (Fig. 8). Its presence in northeastern Brazil is doubtful and needs to be confirmed (Anacleto and Diniz, 2006). The extent of occurrence is 9,660,000 km^2 but no information is available on the area of occupancy.

Population: It is a relatively common species.

Habitats and Ecology: *C. unicinctus* inhabits tropical lowland and submontane forest. Although it is not found in agricultural areas, it possibly occurs in secondary forest. Habitat degradation and fragmentation are advancing at a fast pace in the range of this species.

Threats: There are no major threats to this species. Populations in the south of the range are subjected to some hunting and habitat loss (*e.g.*, Machado *et al.,* 1998; Aguiar and Fonseca, 2008).

Conservation: It is present in some protected areas.

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

Evaluators: Anacleto, T.C.S. and Medri, I.M.

Contributors: Medri, I.M. and Moraes Tomas, W.

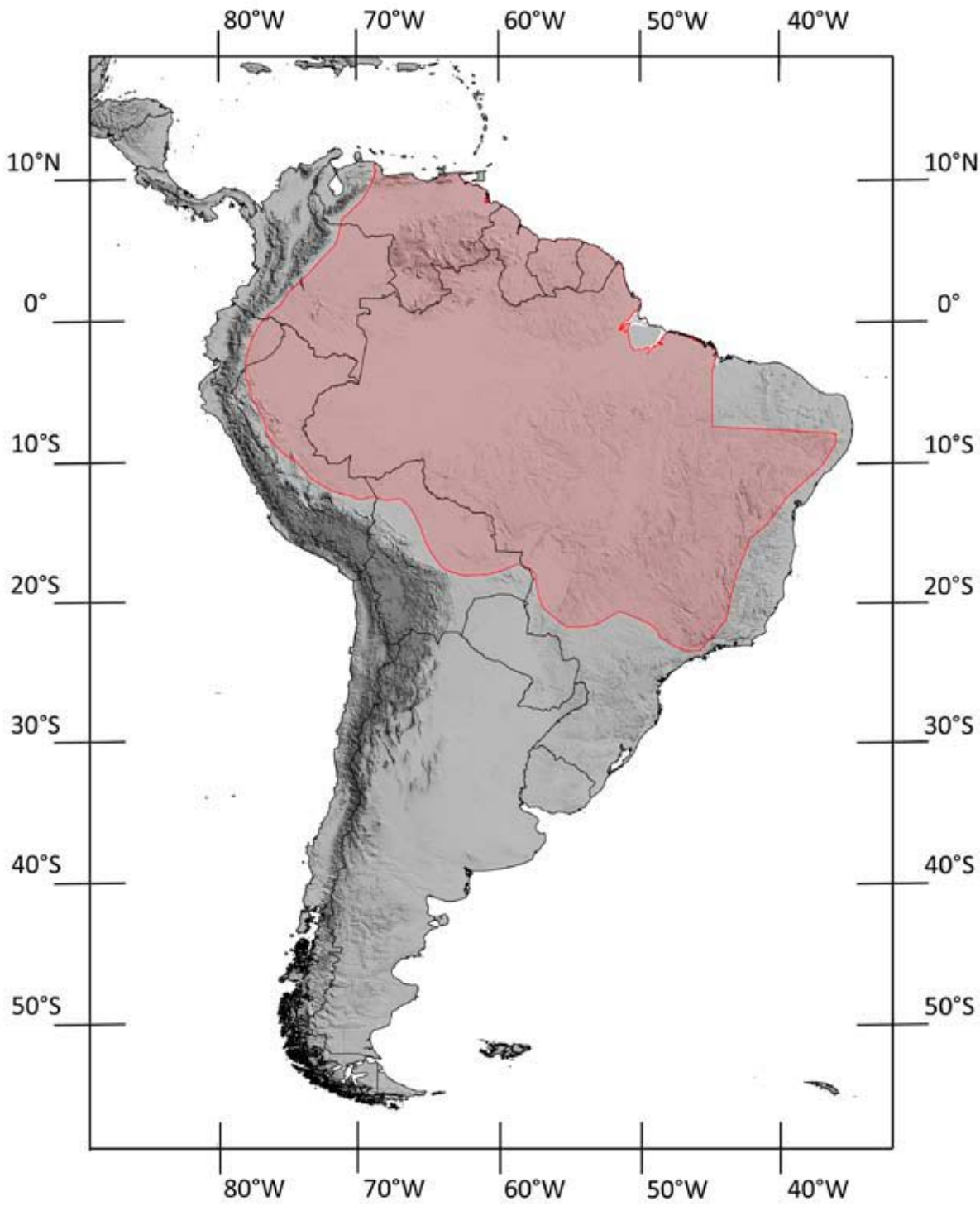

Figure 8. *Cabassous unicinctus*. Based on Wetzel (1982); Pacheco *et al.* (1995); Anderson (1997); Emmons and Feer (1997); Machado *et al.* (1998); Alberico *et al.* (2000); Engstrom and Lim (2000); Gardner (2005); Anacleto and Diniz (2006); Tirira (2007); Aguiar and Fonseca (2008); Tomas *et al.* (2009); Í. M. Medri, pers. comm. (2009).

Calyptophractus retusus

Data Deficient (DD)

Photograph: Romer Miserendino

Common Names: Greater fairy armadillo (English), greater pichi ciego (English), Chacoan fairy armadillo (English), Burmeister's armadillo (English), pichiciego mayor (Spanish), culo tapado (Spanish).

Assessment Rationale: *C. retusus* is classified as Data Deficient because virtually nothing is known about this species. It is known to be patchily distributed in appropriate microhabitats that are subjected to ongoing habitat loss. The species is actively persecuted throughout its range, and a population reduction in the order of 20-25% over the past 10 years is not unlikely.

Taxonomic Note: Two subspecies have been described (Yepes, 1939). Two synonyms are still commonly used for *Calyptophractus retusus* Fitzinger, 1871: *Burmeisteria retusa* Gray, 1865 was preoccupied by *Burmeisteria* Salter, 1865, a trilobite, and is therefore incorrect. *Chlamyphorus retusus* Burmeister, 1863 should not be used, as recent molecular studies support the taxonomic classification of *Chlamyphorus truncatus* and *Calyptophractus retusus* into distinct genera (Delsuc, 2009).

Geographic Range: This species occurs in the Gran Chaco region of central and south-eastern Bolivia, western Paraguay, and extreme northern Argentina (Fig. 9). Two records reported from farther south by Redford and Eisenberg (1992) are not confirmed. The extent of occurrence is 258,000 km^2 but no information is available on the area of occupancy. A continuing decline is inferred due to habitat conversion and degradation.

Population: The population status of this species is not known. Populations are probably severely fragmented, as the greater fairy armadillo only inhabits loose sandy soils that are not common in the Paraguayan Chaco.

Habitats and Ecology: *C. retusus* is restricted to loose, sandy soils. It is patchily distributed and absent from areas with clayey soils. It can be found in disturbed habitat, and may be encountered close to villages and other populated areas. Habitat degradation and fragmentation is advancing at a fast pace in the range of this species.

Threats: *C. retusus* is threatened by habitat loss in the Chaco region. It is persecuted because of traditional beliefs concerning the animal as an omen of disaster (Cuéllar, 2001; Noss *et al.,* 2008).

Conservation: It has been recorded in a number of protected areas in Bolivia (Cuéllar and Noss, 2003), and Reserva Natural General Pizarro in Salta, Argentina (Regidor *et al.*, 2005). In Paraguay, it is known from Defensores del Chaco National Park (Meritt, 2008).

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

Evaluators: Cuéllar, E. and Meritt Jr., D.A.

Contributors: Cuéllar, E. and Meritt Jr., D.A.

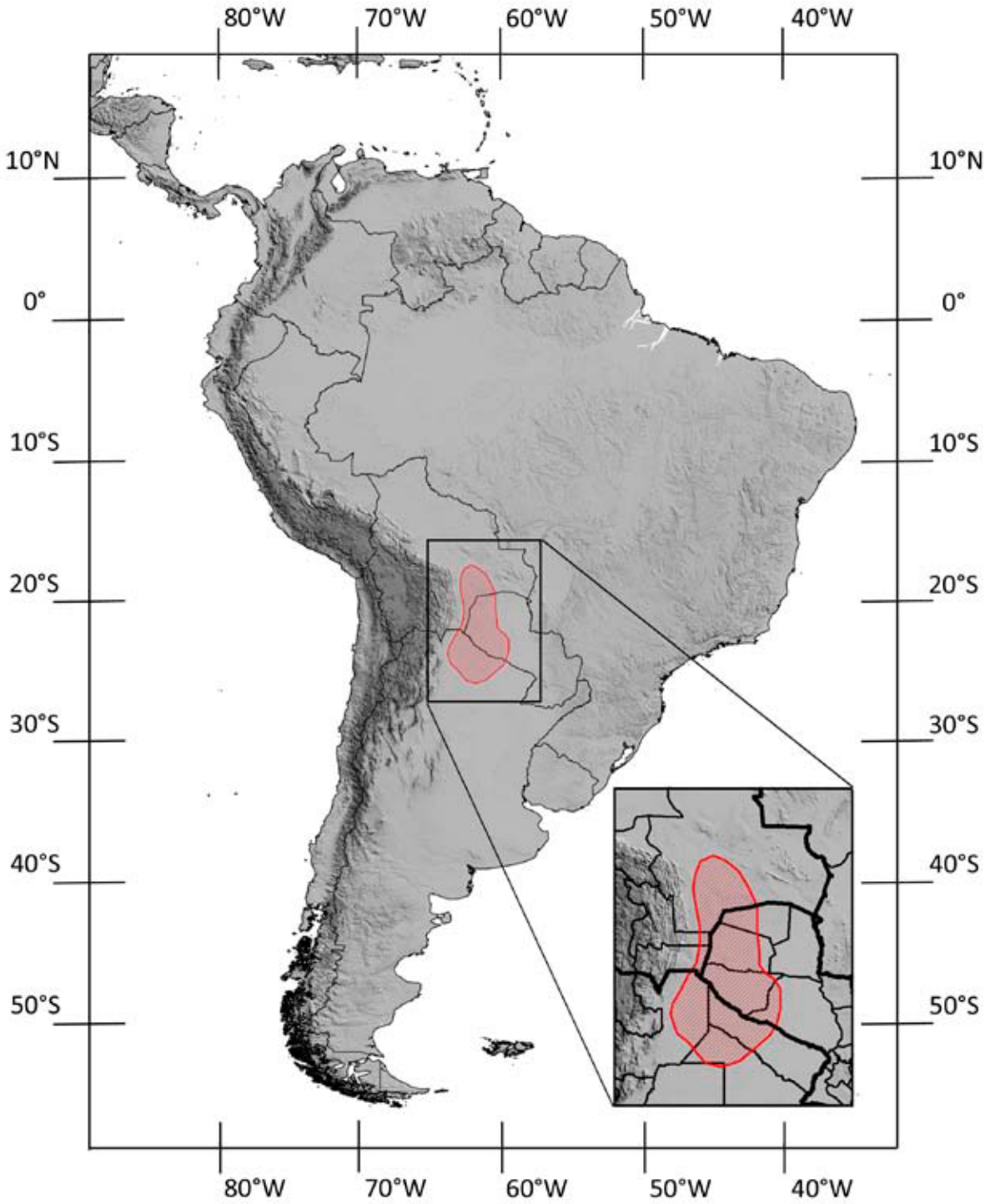

Figure 9. *Calyptophractus retusus*. Based on Yepes (1939); Wetzel (1982); Redford and Eisenberg (1992); Eisenberg and Redford (1999); Gardner (2005); Agüero *et al.* (2005); Vizcaíno *et al.* (2006); Aguiar and Fonseca (2008); Abba and Vizcaíno (2008); Smith (2009); Tarifa and Miserendino Salazar (2009a).

Chaetophractus nationi

Vulnerable (VU A2acd)

Photograph: Gianmarco Rojas Moreno

Common Names: Bolivian hairy armadillo (English), Andean hairy armadillo (English), quirquincho andino (Spanish).

Assessment Rationale: *C. nationi* is listed as Vulnerable because data from Bolivia suggest that populations there have experienced a decline exceeding 30% over the last 10 years, largely due to high rates of exploitation. This species is probably affected by hunting and habitat degradation over its entire range, but the impact of these threats in countries other than Bolivia is unknown due to a lack of field studies.

Taxonomic Note: This taxon may in fact represent a subspecies of *C. vellerosus* (Wetzel, 1985; Gardner, 2005), but more research is required to clarify this issue.

Geographic Range: *C. nationi* is found in Bolivia, Chile, Peru, and northern Argentina (Fig. 10). Its distribution is poorly known because it is often confused with *C. vellerosus*. In Argentina, it has been recorded in localities farther south than its current range (Carrizo *et al.*, 2005), but these records need to be confirmed to exclude the possibility that they correspond to *C. vellerosus. C. nationi* is found from 2,400 to 4,000 m asl. The extent of occurrence is 383,000 km^2 but no information is available on the area of occupancy.

Population: No data are available on the total population size, but Peredo (1999) estimated a population of 13,000 individuals in an area of 340 km^2. A population reduction of 30% in the past 10 years is probable in Bolivia; no data are available from the other range countries. The negative impact on wild populations has not ceased, and an ongoing decline in mature individuals is probable.

Habitats and Ecology: This omnivorous species inhabits high altitude grasslands, where it digs its burrows in sandy soils (Redford and Eisenberg, 1992; Pérez Zubieta, 2008). There is not much information about its life history. Assuming this species is similar to its congeners *C. villosus* and *C. vellerosus*, both genders reach sexual maturity at one year of age, and the female gives birth to one yearly litter of one or two young.

Threats: *C. nationi* is intensively harvested commercially for its meat and carapace, including for charangos (musical instruments) and also handicrafts (Reichle, 1997; Romero-Muñoz and Pérez Zubieta, 2008). Cáceres (1995) estimated yearly harvest rates of 2,000 individuals in Bolivia. Habitat degradation in the altiplano of Bolivia (where 70% of the *C. nationi* population occurs) is advancing at a fast pace, and habitat loss occurs due to sand excavation for concrete production (Peredo, 1999) and agricultural activities (Ríos and Rocha, 2002).

Conservation: It is present in many protected areas. Hunting of this species in Bolivia continues, even though this is prohibited (Pérez Zubieta *et al.*, 2009).

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

Evaluators: Pérez Zubieta, J. and Bermúdez Larrazabal, L.

Contributor: Vizcaíno, S.F.

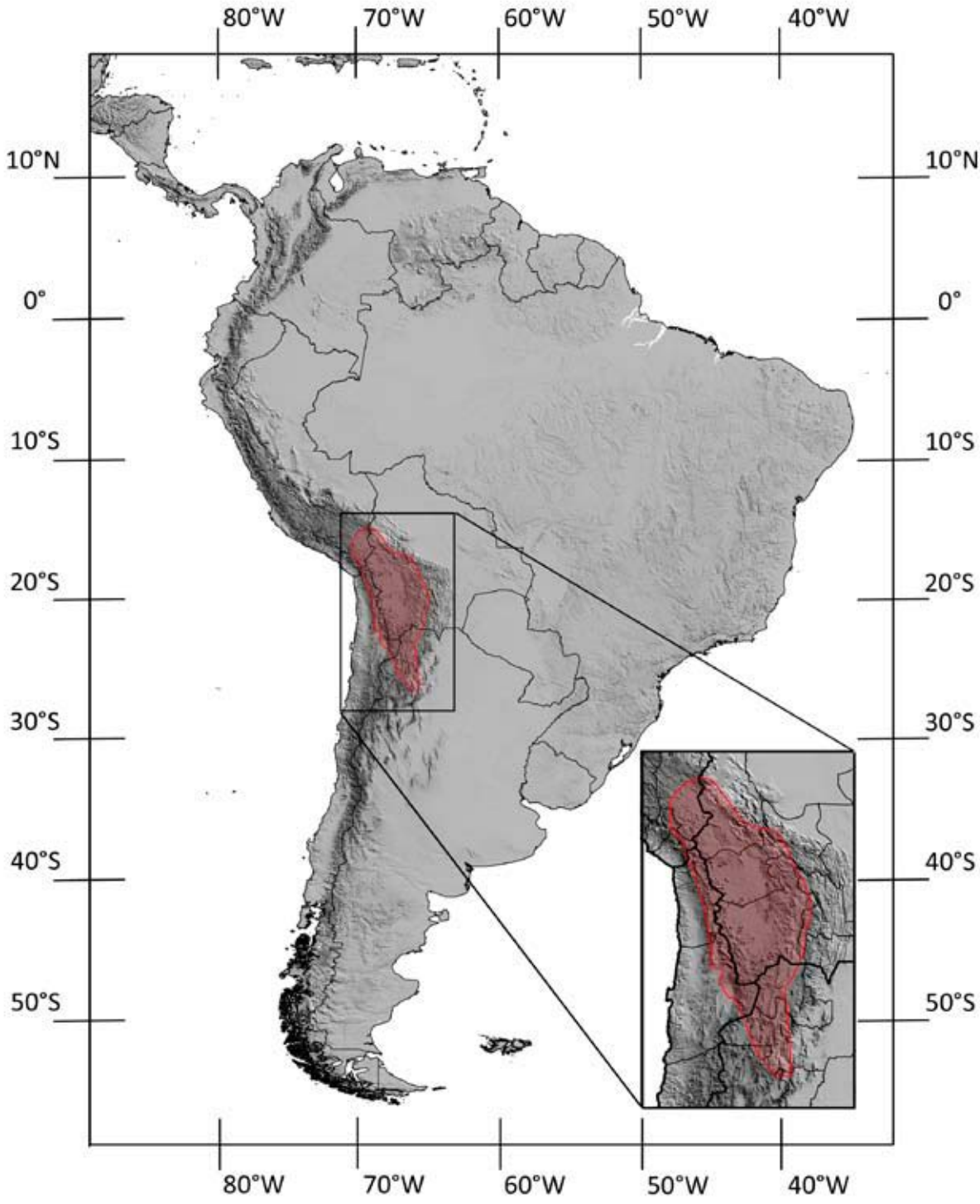

Figure 10. *Chaetophractus nationi*. Based on Wetzel (1985); Redford and Eisenberg (1992); Anderson (1997); Carrizo *et al.* (2005); Gardner (2005); Vizcaíno *et al.* (2006); Aguiar and Fonseca (2008); Iriarte (2008); Pérez Zubieta *et al.* (2009).

Chaetophractus vellerosus

Least Concern (LC)

Photograph: Agustín M. Abba

Common Names: Screaming hairy armadillo (English), piche llorón (Spanish).

Assessment Rationale: *C. vellerosus* is listed as Least Concern because, although susceptible to hunting in parts of its range, it is widespread and rates of offtake are not believed to be at a level that would warrant listing in a category of threat. The disjunct population in Buenos Aires Province is subjected to habitat modification within its restricted range. Further studies are needed to determine the taxonomic status of this particular population.

Taxonomic Note: Two subspecies are described but require confirmation: *C. v. vellerosus* and *C. v. pannosus* (Gardner, 2007).

Geographic Range: This species is generally known from the Chaco region of Bolivia, Paraguay and Argentina. A small, isolated population inhabits an area of around 900 km^2 on the coast of Buenos Aires Province, Argentina. It is separated from the core population by approximately 500 km (Fig. 11). Records from Chile are probably *C. nationi*. It is found from sea level to 1,000 m asl. The extent of occurrence is approximately 1,320,000 km^2 but no information is available on the area of occupancy.

Population: The population status of *C. vellerosus* is not known, but the wild populations are thought to be stable.

Habitats and Ecology: *C. vellerosus* is primarily found in xeric environments, in both lowland and upland areas with loose sandy soils; it has been recorded from rangeland pasture and agricultural areas. The animal constructs burrows, and it is absent from rocky areas where burrows cannot be excavated (Greegor, 1985; Abba *et al*., 2007; Abba, 2008; Abba and Cassini, 2008). It can be found in some degraded habitats (arable land, pastureland and plantations). Males and females reach maturity at one year of age, and the female gives birth to one yearly litter of one or two young. Gestation length is 60 days.

Threats: *C. vellerosus* is heavily hunted for its meat and carapace (including for charangos; Aguiar and Fonseca, 2008), especially by indigenous groups in some parts of the Chaco region in Bolivia (Cuéllar and Noss, 2003; Noss *et al*., 2008). It is also persecuted as an agricultural pest. In addition, some animals are killed by dogs. The isolated population on the coast of Buenos Aires Province, Argentina, is negatively affected by mining activities (Abba, 2008).

Conservation: *C. vellerosus* is present in a number of protected areas. The highest density of this species in a protected area probably occurs in the Kaa-Iya National Park (3.4 million hectares), Bolivia.

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

Evaluators: Poljak, S. and Cuéllar, E.

Contributor: Vizcaíno, S.F.

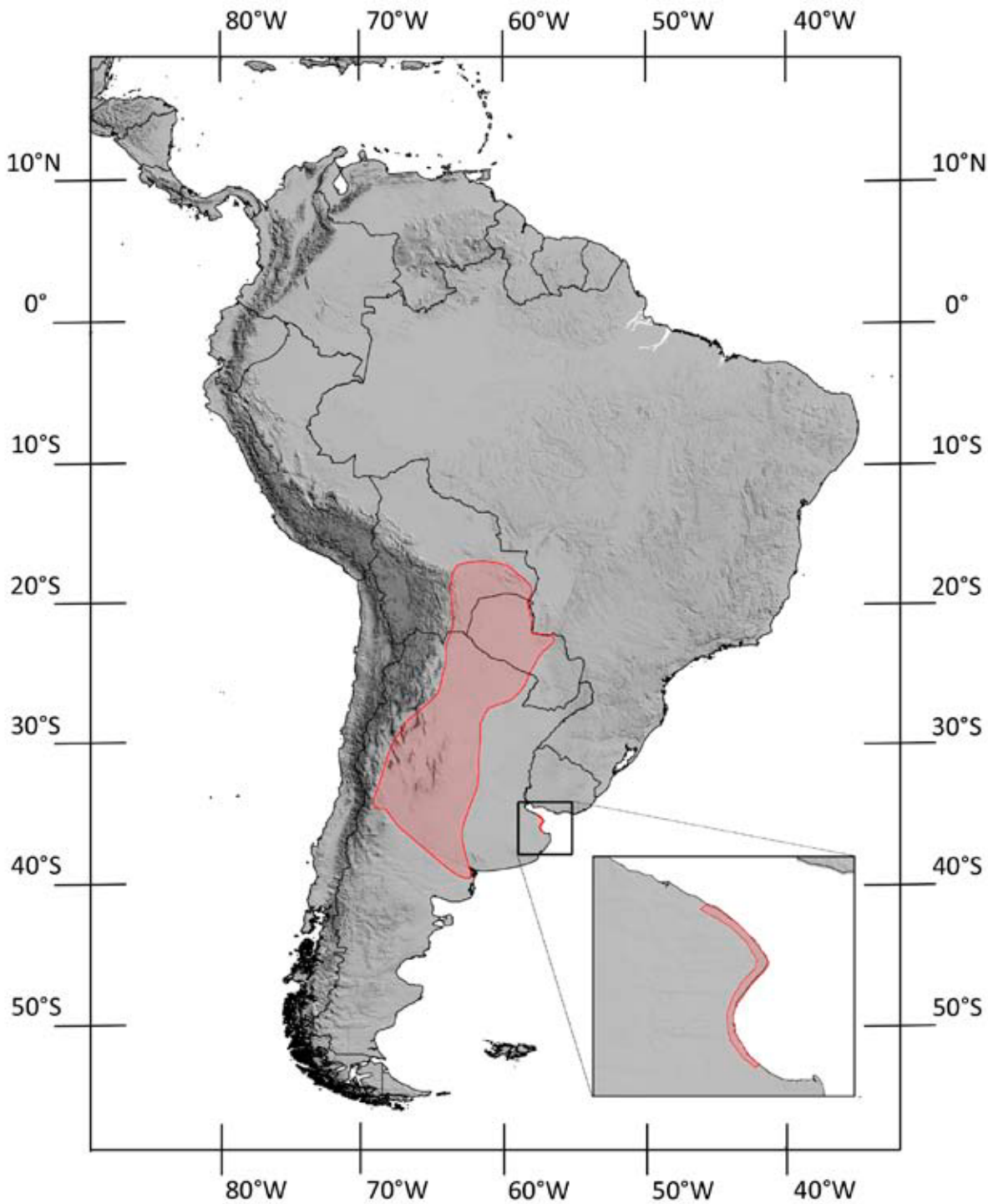

Figure 11. *Chaetophractus vellerosus*. Based on Crespo (1974); Carlini and Vizcaíno (1987); Redford and Eisenberg (1992); Anderson (1997); Cuéllar and Noss (2003); Gardner (2005); Vizcaíno *et al.* (2006); Abba *et al.* (2007); Abba (2008); Abba and Cassini (2008); Abba and Vizcaíno (2008); Aguiar and Fonseca (2008); Noss *et al.* (2008); Smith (2009); Tarifa and Romero-Muñoz (2009b); A. M. Abba, pers. comm. (2009); T. Rogel, pers. comm. (2009).

Chaetophractus villosus

Least Concern (LC)

Photograph: Kevin Schafer, www.kevinschafer.com

Common Names: Large hairy armadillo (English), peludo (Spanish).

Assessment Rationale: *C. villosus* is listed as Least Concern in view of its wide distribution, presumed large population, its presence 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.

Geographic Range: It is present in the Gran Chaco of Bolivia, Paraguay, and Argentina and as far south as Santa Cruz, Argentina and Magallanes, Chile (Fig. 12). It has been introduced in Tierra del Fuego Province, Argentina (Poljak *et al.*, 2007; Poljak *et al.*, 2010). It ranges from sea level up to 1,500 m asl (Argentina). The extent of occurrence is approximately 2,525,000 km^2 but no information is available on the area of occupancy.

Population: This is one of the most common armadillo species in Argentina (Abba, 2008).

Habitats and Ecology: *C. villosus* is present in a wide variety of grasslands (including pampas and chaco), savanna, and forest habitats. It is also found in cultivated landscapes (Abba *et al.*, 2005; Abba *et al.*, 2007; Abba, 2008) and some degraded habitats (arable land, pastureland, rural gardens, and plantations). Males and females reach sexual maturity at one year of age, and the female gives birth to one yearly litter of one to three young. Gestation length is 68 days.

Threats: In general, there appear to be no major threats to this species. In some parts of its range it is locally used for food and charangos (Aguiar and Fonseca, 2008). It is also persecuted as a pest species in agricultural areas, and is subjected to sport hunting. Animals may also be killed on roads and by dogs (Abba *et al.*, 2007; Abba, 2008).

Conservation: This species is present in many protected areas.

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

Evaluators: Bolkovic, M.L. and Poljak, S.

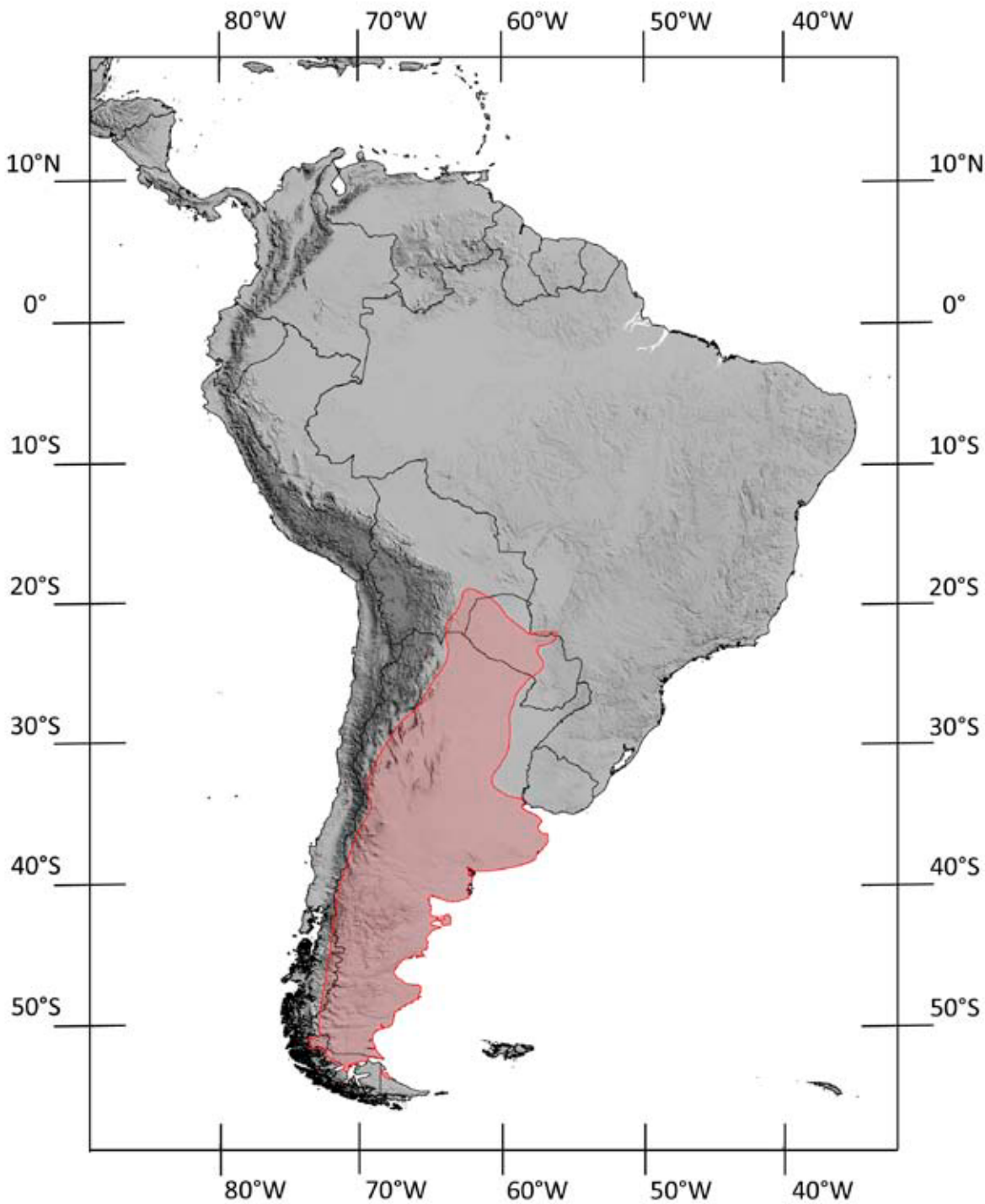

Figure 12. *Chaetophractus villosus*. Based on Redford and Eisenberg (1992); Ergueta and Morales (1996); Anderson (1997); Gardner (2005); Vizcaíno *et al.* (2006); Poljak *et al.* (2007); Aguiar and Fonseca (2008); Iriarte (2008); Smith (2009); Tarifa and Romero-Muñoz (2009b); A. M. Abba, pers. comm. (2009).

Chlamyphorus truncatus

Data Deficient (DD)

Photograph: Mariella Superina

Common Names: Pink fairy armadillo (English), lesser pichi ciego (English), lesser fairy armadillo (English), pichiciego (Spanish).

Assessment Rationale: *C. truncatus* is listed as Data Deficient as there is little information on its population status, and its biology and ecology are poorly known. Throughout its range there is extensive habitat degradation, especially from cattle, but the actual effect on the populations is not well understood. *C. truncatus* remains a priority for further survey work, as the availability of additional information may well show that the species requires listing as Near Threatened or in a threatened category.

Taxonomic Note: Three subspecies have been described (Yepes, 1932).

Geographic Range: *C. truncatus* is endemic to central Argentina, where it is found in the provinces of Buenos Aires (southern part only), Catamarca, Córdoba, La Pampa, La Rioja, Mendoza, Río Negro, San Juan, and San Luis (Fig. 13). It ranges from sea level up to 1,500 m asl. The extent of occurrence is approximately 350,000 km^2 but no information is available on its area of occupancy.

Population: It may be relatively rare. Nothing is known about its population size or trend, but a reduction in sightings has been reported (Superina, 2006). The populations are fragmented; records are very isolated from each other. The species seems to have very specific habitat requirements.

Habitats and Ecology: This poorly known, nocturnal species is found in dry grassland and sandy plains with shrubby vegetation. Suitable habitat is declining.

Threats: Habitat conversion due to agriculture (plowing of fields) and cattle ranching (compaction of soil) are the predominant threats this species is facing, but predation by domestic cats and dogs is also contributing to its decline.

Conservation: It is present in a number of protected areas, including the National Parks Lihué Calel and Talampaya, and the provincial reserves Telteca and Ñacuñán in Mendoza. There is national and provincial legislation specifically in place for its protection, such as Provincial Law 6,599 in Mendoza. Further studies into the population status, demography and ecology of this species are needed.

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

Evaluators: Seitz, V. and Roig, V.G.

Contributor: Roig, V.G.

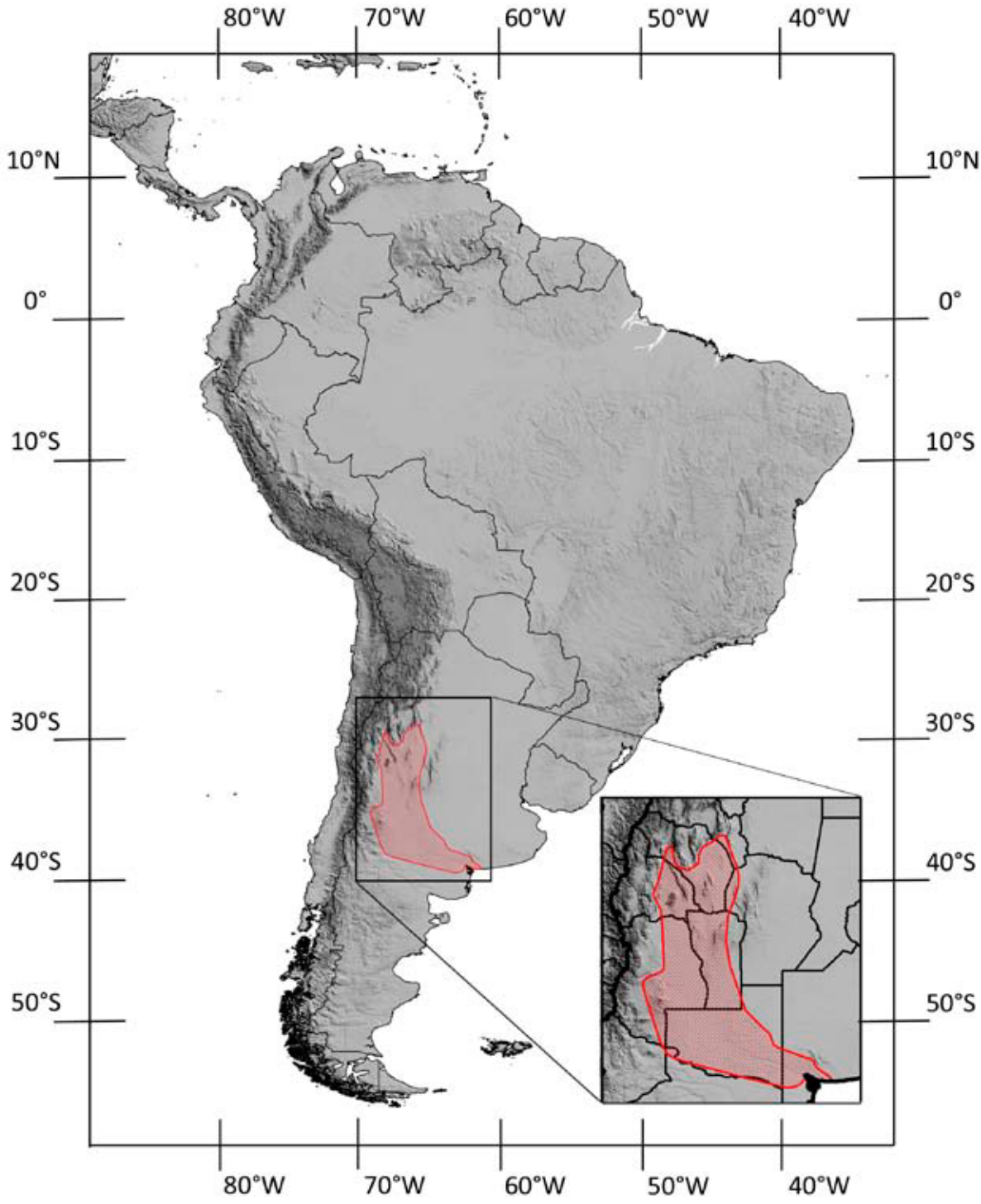

Figure 13. *Chlamyphorus truncatus*. Based on Wetzel (1982); Redford and Eisenberg (1992); Gardner (2005); Superina (2006); Aguiar and Fonseca (2008); and point localities reported by the following persons: M. Superina, A. M. Abba, V. Seitz, J. Monguillot, E. Fra, J. Corts, C. Maldonado, P. Collavino, G. Ferraris, G. Loza, T. Rogel, E. Martinez, R. Pereyra, L. Orozco, M. Jordan, C. Aguerre, A. Dalmasso, D. Martin, D. Martí, R. Yacante, J. Pereyra.

Dasypus hybridus

Near Threatened (NT)

Photograph: Agustín M. Abba

Common Names: Southern long-nosed armadillo (English), mulita (Spanish), mulita pampeana (Spanish).

Assessment Rationale: *D. hybridus* is listed as Near Threatened, as it is believed to have undergone a decline on the order of 20–25% over the past 10 years due to severe habitat loss and hunting throughout its range. The species was previously more widespread and locally more common (over 30 years ago). It almost qualifies as Threatened under criterion A2cd.

Taxonomic Note: For many years, *D. hybridus* was considered synonym of *D. septemcinctus*.

Geographic Range: *D. hybridus* is found in Argentina, Uruguay, Paraguay, and southern Brazil. It occurs as far south as the province of Buenos Aires, Argentina (Abba, 2008; Fig. 14). The distribution is more restricted than depicted by Redford and Eisenberg (1992) and Wetzel (1985), as localities in the west near the Andes are based on incorrectly identified individuals. The exact northern limit of its range is uncertain due to its morphological similarity to *D. septemcinctus*. It ranges from sea level up to 2,000 m asl. The extent of occurrence is approximately 1,420,000 km^2 but no information is available on its area of occupancy.

Population: It was previously common (although there are no population density estimates available), but it is sensitive to habitat loss through urbanization, and agricultural expansion has meant that populations are declining or absent over much of its former range (Abba *et al.*, 2007). It remains a common species in parts of its range (*e.g.*, the province of Buenos Aires; Abba, 2008).

Habitats and Ecology: *D. hybridus* is typically found in the grasslands and pampas of northern and central Argentina (Abba *et al.*, 2007; Abba, 2008; Abba and Cassini, 2008). It is also present, but less common, in woodland and forest habitats. It can be found in some degraded habitats (arable land, pastureland and plantations). Agricultural activities and cattle ranching are heavily modifying the habitat of this species. Males and females reach maturity at one year of age, and the female gives birth to one yearly litter of six to twelve identical (monozygotic) young. Gestation length is 120 days including diapause.

Threats: *D. hybridus* is threatened by habitat loss through agriculture and urbanization, accidental mortality on roads, direct hunting for food, and predation by dogs (Abba *et al.*, 2007; Abba, 2008).

Conservation: *D. hybridus* has been recorded in a few protected areas, such as the National Parks Campos del Tuyú, El Palmar and Río Pilcomayo. It is considered a conservation priority species in Uruguay (E. Gonzalez, pers. comm., 2010).

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

Evaluators: Gonzalez, E. and Bolkovic, M.L.

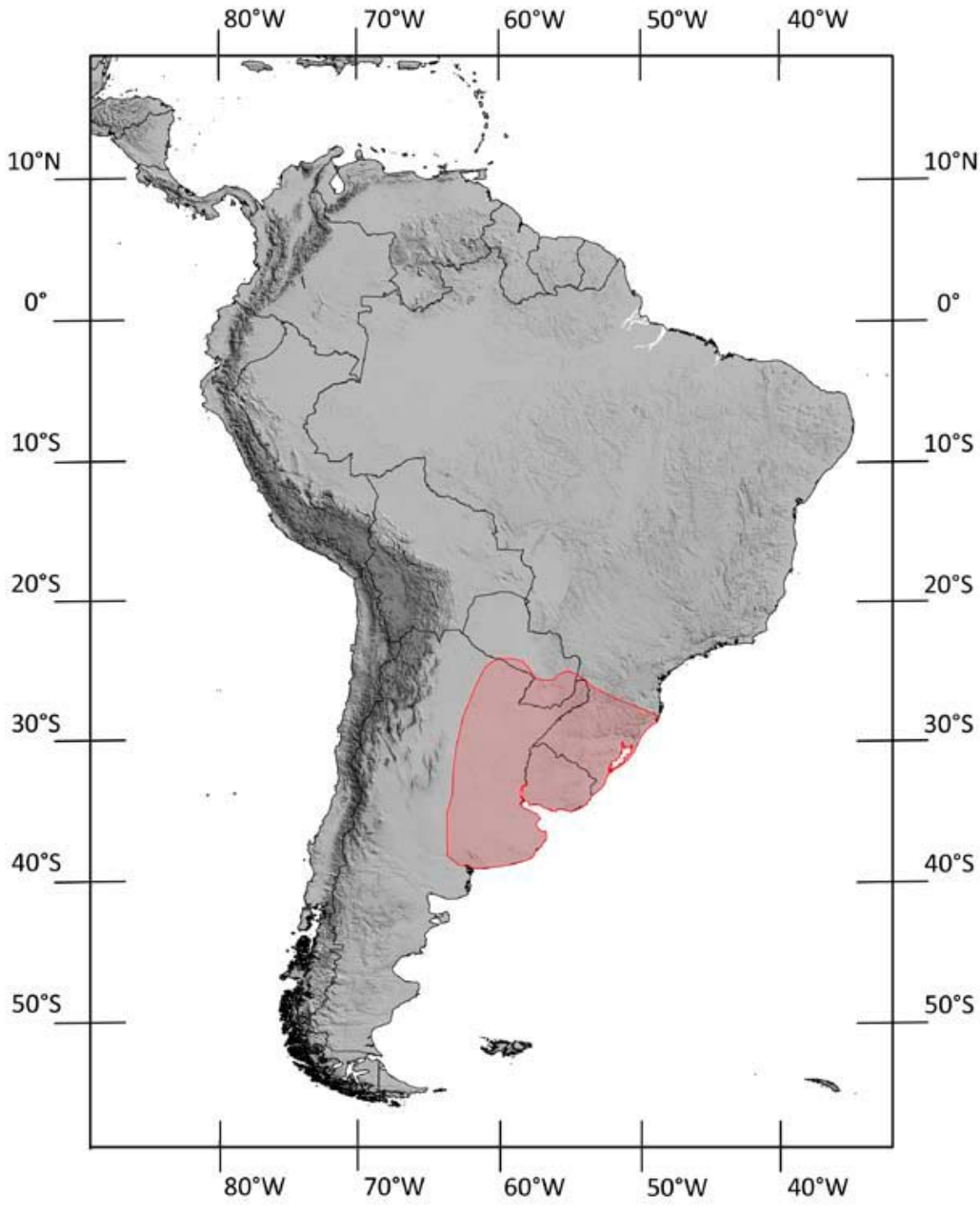

Figure 14. *Dasypus hybridus*. Based on Wetzel and Mondolfi (1979); Wetzel (1982); Wetzel (1985); Redford and Eisenberg (1992); Eisenberg and Redford (1999); Cherem *et al.* (2004); Gardner (2005); Vizcaíno *et al.* (2006); Abba (2008); Abba and Vizcaíno (2008); Aguiar and Fonseca (2008); Smith (2009); A. M. Abba, pers. comm. (2009).

Dasypus kappleri

Least Concern (LC)

Camera trap photograph: Daniel Munari

Common Names: Greater long-nosed armadillo (English), mulita de Kappler (Spanish), tatú-peba grande (Spanish), armadillo coligrueso (Spanish), tatu quinze quilos (Portuguese).

Assessment Rationale: *D. kappleri* 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.

Taxonomic Note: Two subspecies are described (Gardner, 2005).

Geographic Range: This species has been recorded from Colombia (east of the Andes), Venezuela (south of the Orinoco), Guyana, Suriname, French Guiana, and south through the Amazon Basin of Brazil, Ecuador, Peru and northern Bolivia (Pando Department; Fig. 15). In Brazil, it occurs in a large part of the state of Mato Grosso, but has not been recorded from southern Pará state, east of the Rio Tapajós. The easternmost locality is on the left bank of Rio das Mortes, a tributary of the upper Rio Araguaia, western Mato Grosso. There is a potentially disjunct population to the south of Marajó Island (Eisenberg and Redford, 1999). Its extent of occurrence is approximately 5,500,000 km^2 but no information is available on its area of occupancy.

Population: No information is available on the population status of *D. kappleri*.

Habitats and Ecology: This species is restricted to the tropical moist lowland forests of the Orinoco and Amazon river basins. In savanna areas, it is restricted to forest patches. *D. kappleri* constructs burrows in well-drained soil. The females typically give birth to two young (Eisenberg, 1989).

Threats: There are no major threats. Locally, *D. kappleri* is threatened by deforestation, and in Ecuador and Brazil it is subjected to hunting (Tirira, 2001; T.C.S. Anacleto, pers. comm., 2010). It is unable to survive in savannas or open areas.

Conservation: *D. kappleri* is present in a number of protected areas.

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

Evaluators: Anacleto, T.C.S. and Arteaga, M.C.

Contributors: Anacleto, T.C.S., Medri, I.M. and Moraes Tomas, W.

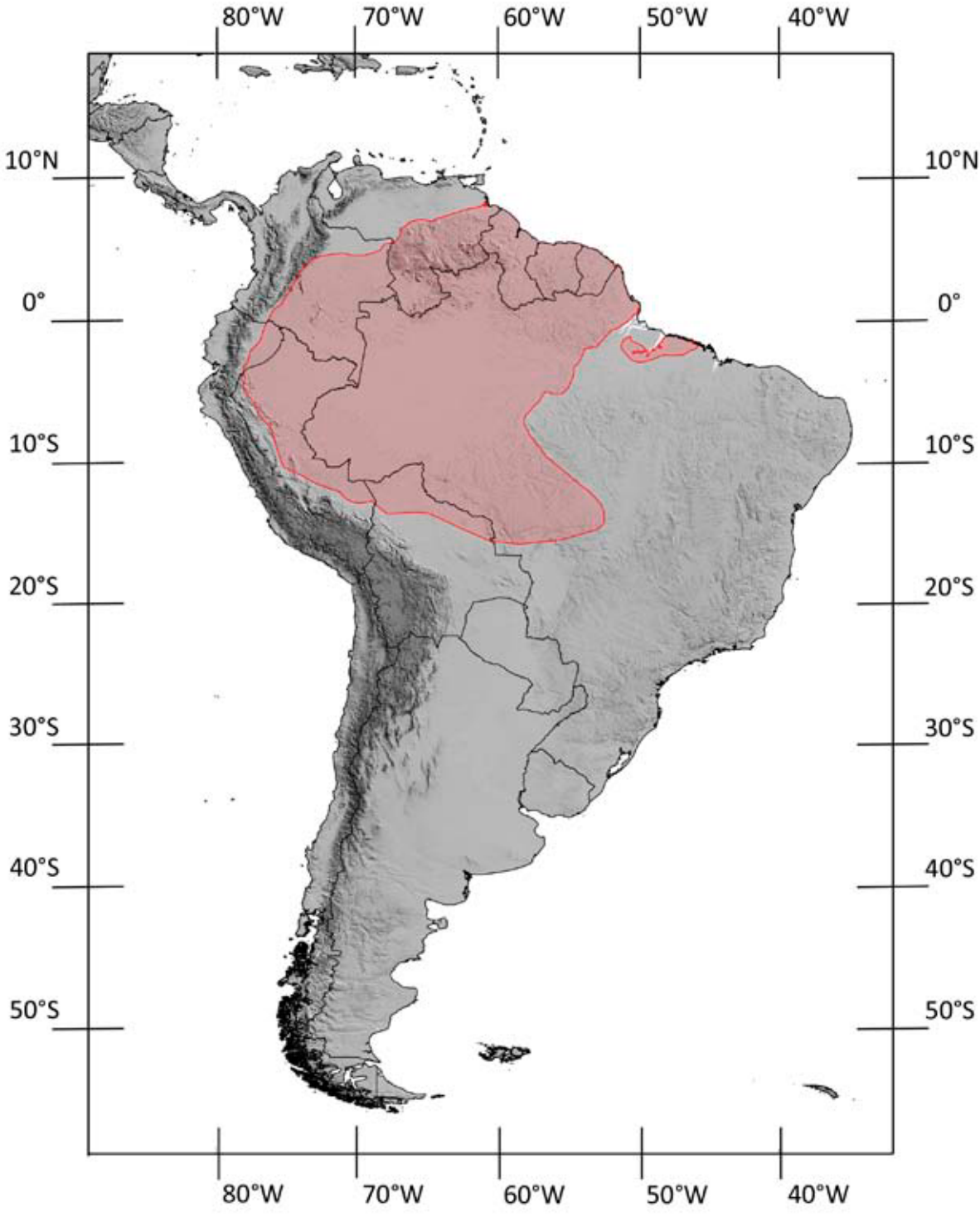

Figure 15. *Dasypus kappleri*. Based on Wetzel (1982); Pacheco *et al.* (1995); Eisenberg and Redford (1999); Tirira (1999); Alberico *et al.* (2000); Engstrom and Lim (2000); Gardner (2005); Tirira (2007); Aguiar and Fonseca (2008); Tarifa and Miserendino Salazar (2009b); Í. M. Medri, pers. comm. (2009).

Dasypus novemcinctus

Least Concern (LC)

Photograph: Mariella Superina

Common Names: Nine-banded armadillo (English), common long-nosed armadillo (English), cachicamo (Spanish), tatú (Spanish), tatu-galinha (Portuguese).

Assessment Rationale: *D. novemcinctus* is listed as Least Concern in view of its very wide distribution, presumed large population, tolerance of habitat alteration, and because there is no evidence of a major population decline.

Taxonomic Note: Six subspecies are recognized by Gardner (2005), four of which occur in South America (Gardner, 2007).

Geographic Range: This species ranges from the southern USA through Mexico and Central America, to South America as far south as northern Argentina (Fig. 16). It is also present in the Lesser Antilles, on Grenada and Trinidad and Tobago. It ranges from sea level up to 2,000 m asl. The extent of occurrence is approximately 19,100,000 km^2 but no information is available on the area of occupancy.

Population: It is a common species.

Habitats and Ecology: *D. novemcinctus* is very adaptable and is present in a wide variety of habitats (McBee and Baker, 1982). It can be found in some degraded habitats, such as heavily degraded subtropical and tropical forests, arable land, pastureland, rural gardens, urban areas and plantations. Males reach sexual maturity at 12 months and females at 18 months of age, and the female gives birth to one yearly litter after a gestation of 140 days including diapause. It has a high rate of reproduction and commonly produces monozygotic (genetically identical) quadruplets. Generation length has been estimated at five years, and longevity is around eight to twelve years.

Threats: There are no major threats to this species, although it is hunted throughout its range. In North America, it is subjected to poisoning as it is often considered a nuisance.

Conservation: *D. novemcinctus* occurs in many protected areas.

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

Evaluators: McDonough, C. and Loughry, J.

Contributors: McDonough, C. and Loughry, J.

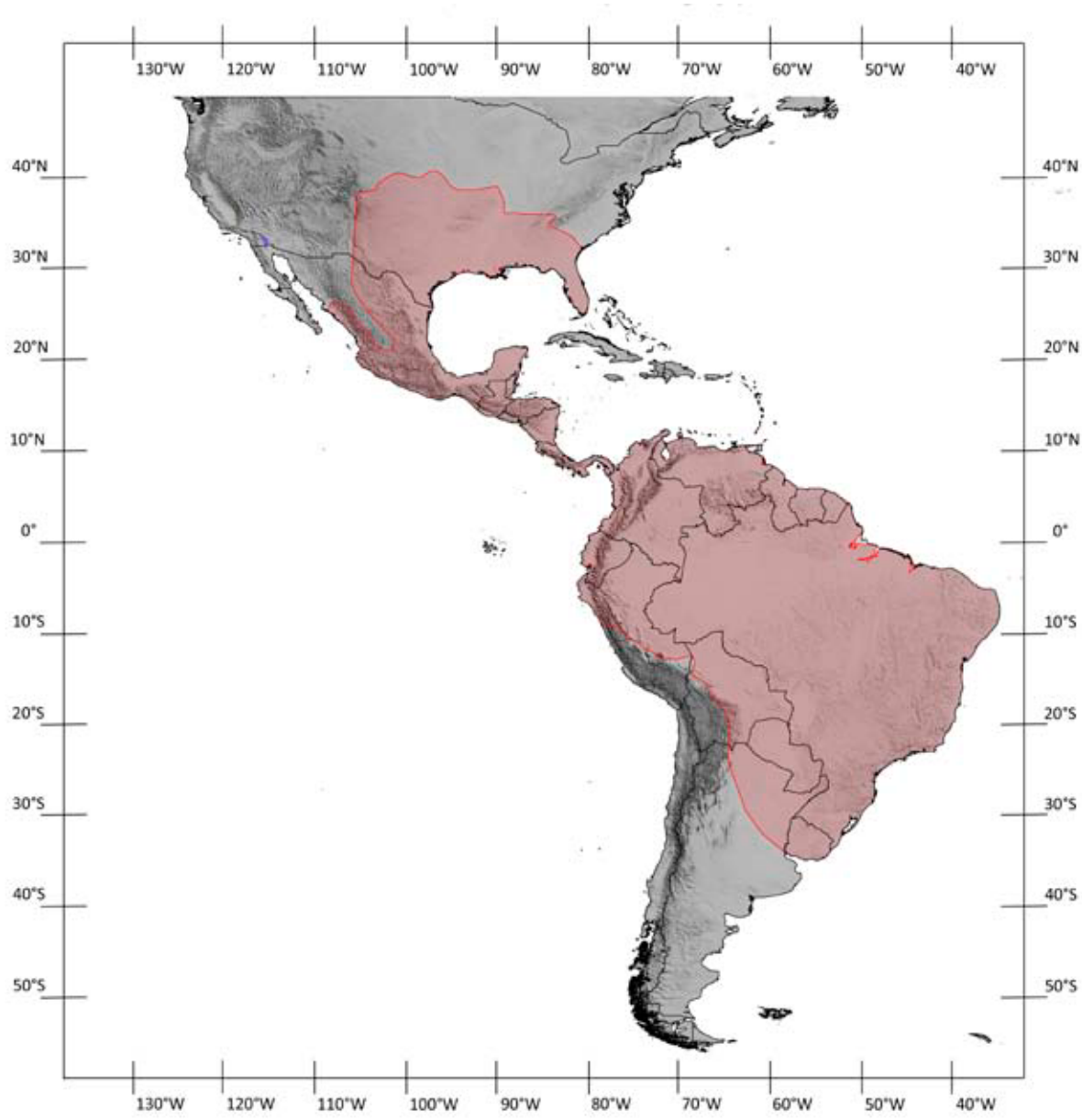

Figure 16. *Dasypus novemcinctus*. Based on McBee and Baker (1982); Platt and Snyder (1995); Taulman and Robbins (1996); Freeman and Genoways (1998); Van Deelen *et al.* (2002); Layne (2003); Gardner (2005); Vizcaíno *et al.* (2006); Gardner (2007); Stuart *et al.* (2007); Abba and Vizcaíno (2008); Aguiar and Fonseca (2008); Frey and Stuart (2009); Hofmann (2009); A. M. Abba, pers. comm. (2009).

Dasypus pilosus

Vulnerable (VU B2ab(iii))

Photograph: Andre Baertschi, www.wildtropix.com

Common Names: Hairy long-nosed armadillo (English), tatú peludo (Spanish), quirquincho peludo (Spanish).

Assessment Rationale: *D. pilosus* is listed as Vulnerable due to the very limited number of known locations, and because there is continuing and accelerating decline of its fragmented habitat.

Taxonomic Note: This species was originally described as *Cryptophractus pilosus* Fitzinger, 1856 (Gardner, 2007).

Geographic Range: *D. pilosus* has been recorded only from the south-western Peruvian Andes in the departments of San Martín, La Libertad, Huánuco, and Junín (Pacheco *et al.*, 1995; Gardner, 2005). It has recently been observed in the department of Amazonas (L. Bermúdez Larrazábal, pers. comm., 2009). The known localities were incorrectly mapped by Wetzel (1982), and repeated in Eisenberg and Redford (1999). It ranges from 500 to 3,000 m asl. The exact range of this species is unknown; its extent of occurrence is estimated at 53,000 km^2. Only five locations are known to date due to the lack of field studies.

Population: There is no information on the population status of *D. pilosus*.

Habitats and Ecology: This little-known species is endemic to the Peruvian yungas (sub-tropical montane deciduous and evergreen forests). It is found in areas with dense or shady cover and limestone formations. Deforestation is advancing at a fast pace within the range of *D. pilosus*, leading to a continuing decline in suitable habitat.

Threats: *D. pilosus* is threatened by severe deforestation of its habitat. It is likely subjected to hunting, but there is no information on the intensity and the degree to which it constitutes a major threat.

Conservation: It has been recorded from the Río Abiseo National Park.

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

Evaluators: Bermúdez Larrazabal, L. and Loughry, J.

Contributor: Bermúdez Larrazabal, L.

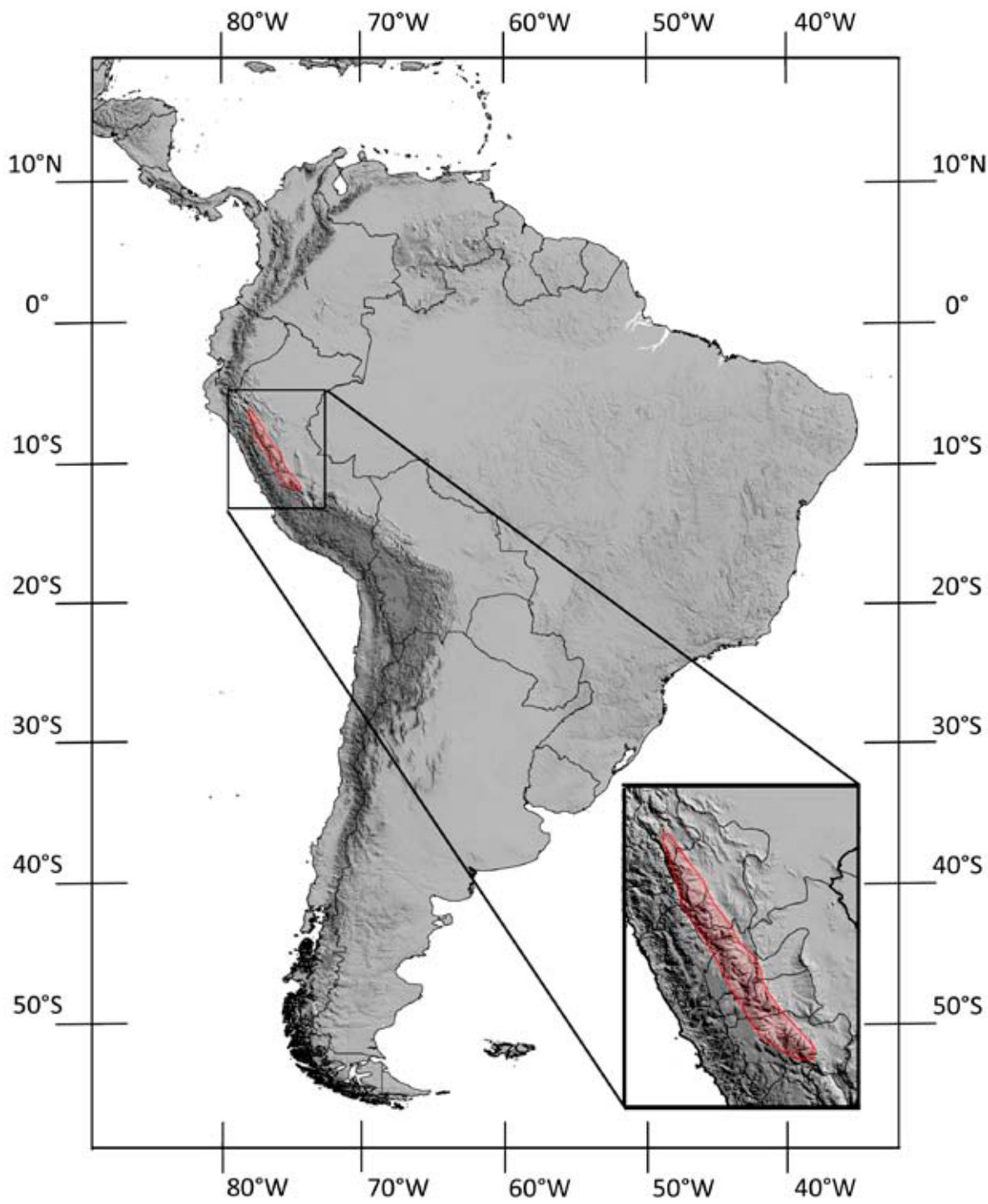

Figure 17. *Dasypus pilosus*. Based on Pacheco *et al.* (1995); Gardner (2005); Aguiar and Fonseca (2008); L. Bermúdez Larrazábal, pers. comm. (2009).

Dasypus sabanicola

Least Concern (LC)

Photograph: Diego Rodriguez

Common Names: Northern long-nosed armadillo (English), llanos long-nosed armadillo (English), tatú de sabana (Spanish), cachicamo sabanero (Spanish).

Assessment Rationale: *D. sabanicola* is listed as Least Concern in view of its wide distribution, the availability of significant areas of suitable intact savanna habitat, and the absence of major threats to this species. There is evidence of severe hunting in some parts of the species' range.

Taxonomic Note: The taxonomic status of this species should be verified through genetic analyses.

Geographic Range: *D. sabanicola* is found throughout the Llanos (the flat plains) of Venezuela and Colombia (Fig. 18). It has been recorded at elevations between 25 and 200 m asl (Eisenberg, 1989). The extent of occurrence is approximately 445,000 km^2 but no information is available on the area of occupancy.

Population: *D. sabanicola* is locally rare. It has been found to be moderately common in intact natural habitats.

Habitats and Ecology: It is generally restricted to open or shrubland habitats in lowland and mid-altitude areas. Animals have a home range of between 1.7 and 11.6 hectares (Ferguson-Laguna, 1984). The female gives birth to one yearly litter of four young.

Threats: In parts of its range it is threatened by intense hunting for subsistence purposes (Ferguson-Laguna, 1984) and by ongoing habitat loss.

Conservation: *D. sabanicola* has been recorded from several protected areas and is protected by national legislation in Venezuela.

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

Evaluators: Arteaga, M.C. and Lara, P.

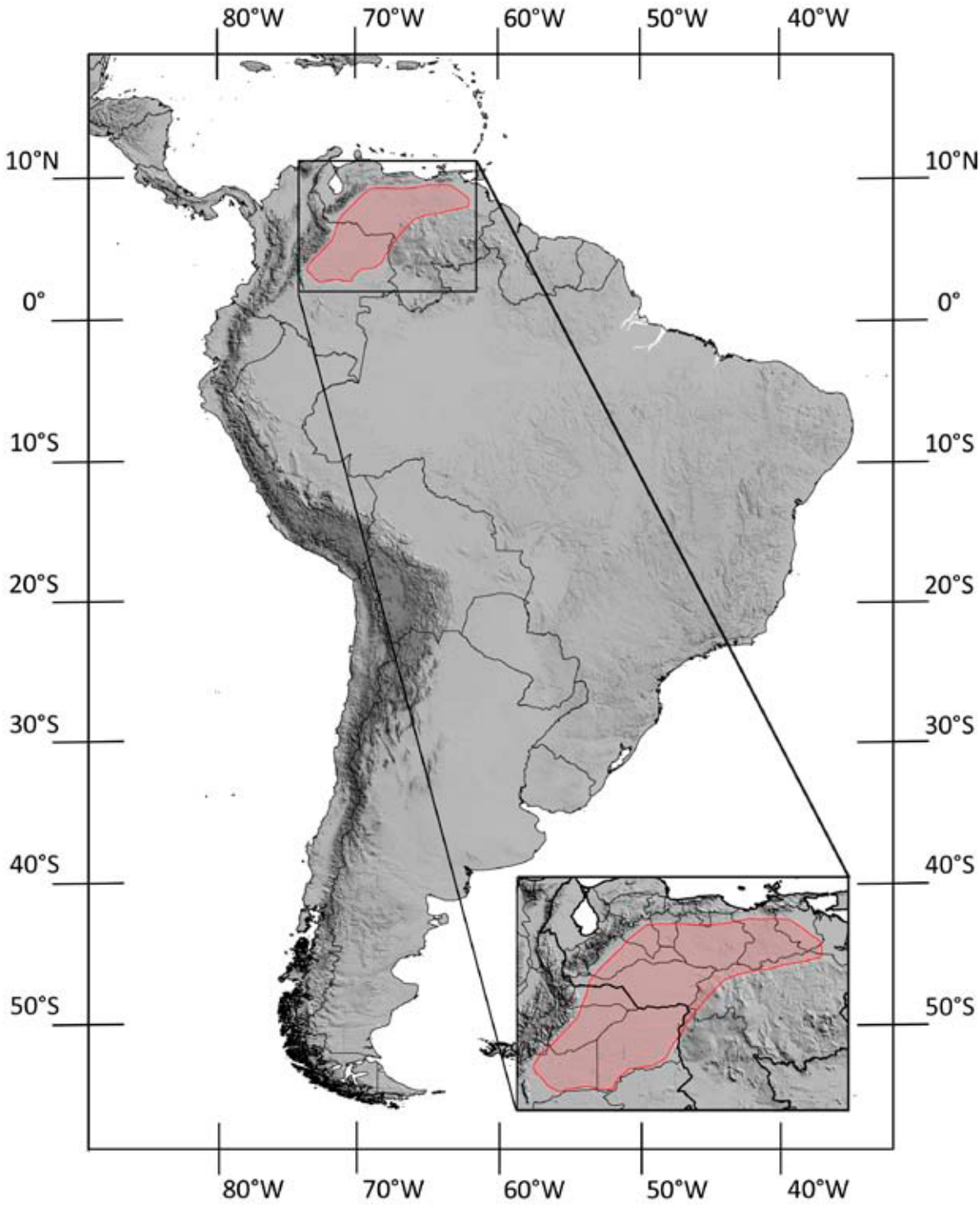

Figure 18. *Dasypus sabanicola*. Based on Wetzel (1982); Ferguson-Laguna (1984); Reid (1997); Eisenberg and Redford (1999); Lord (2000); Gardner (2005); Aguiar and Fonseca (2008).

Dasypus septemcinctus

Least Concern (LC)

Photograph: Teresa Cristina Anacleto

Common Names: Seven-banded armadillo (English), Brazilian lesser long-nosed armadillo (English), mulita chica (Spanish), tatu-mirim (Portuguese).

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

Taxonomic Note: For many years *D. septemcinctus* was considered synonym of *D. hybridus.*

Geographic Range: *D. septemcinctus* ranges from the lower Amazon Basin of Brazil to the Gran Chaco of Bolivia, Paraguay, and northern Argentina (presence uncertain; Fig. 19). Its southern limit is uncertain due to morphological similarities with *D. hybridus*, *D. yepesi* and juvenile *D. novemcinctus* (see Hamlett, 1939). The extent of occurrence is approximately 5,870,000 km^2 but no information is available on its area of occupancy.

Population: The population status of *D. septemcinctus* is not known.

Habitats and Ecology: *D. septemcinctus* appears to be a grassland species. However, in south-eastern Brazil it prefers to live in gallery forests. It seems to be adaptable to human disturbance and secondary habitat (Aguiar and Fonseca, 2008).

Threats: There are no major threats. Locally, *D. septemcinctus* is threatened by habitat degradation and hunting for food.

Conservation: *D. septemcinctus* is present in some protected areas.

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

Evaluators: Anacleto, T.C.S. and Medri, I.M.

Contributor: Anacleto, T.C.S.

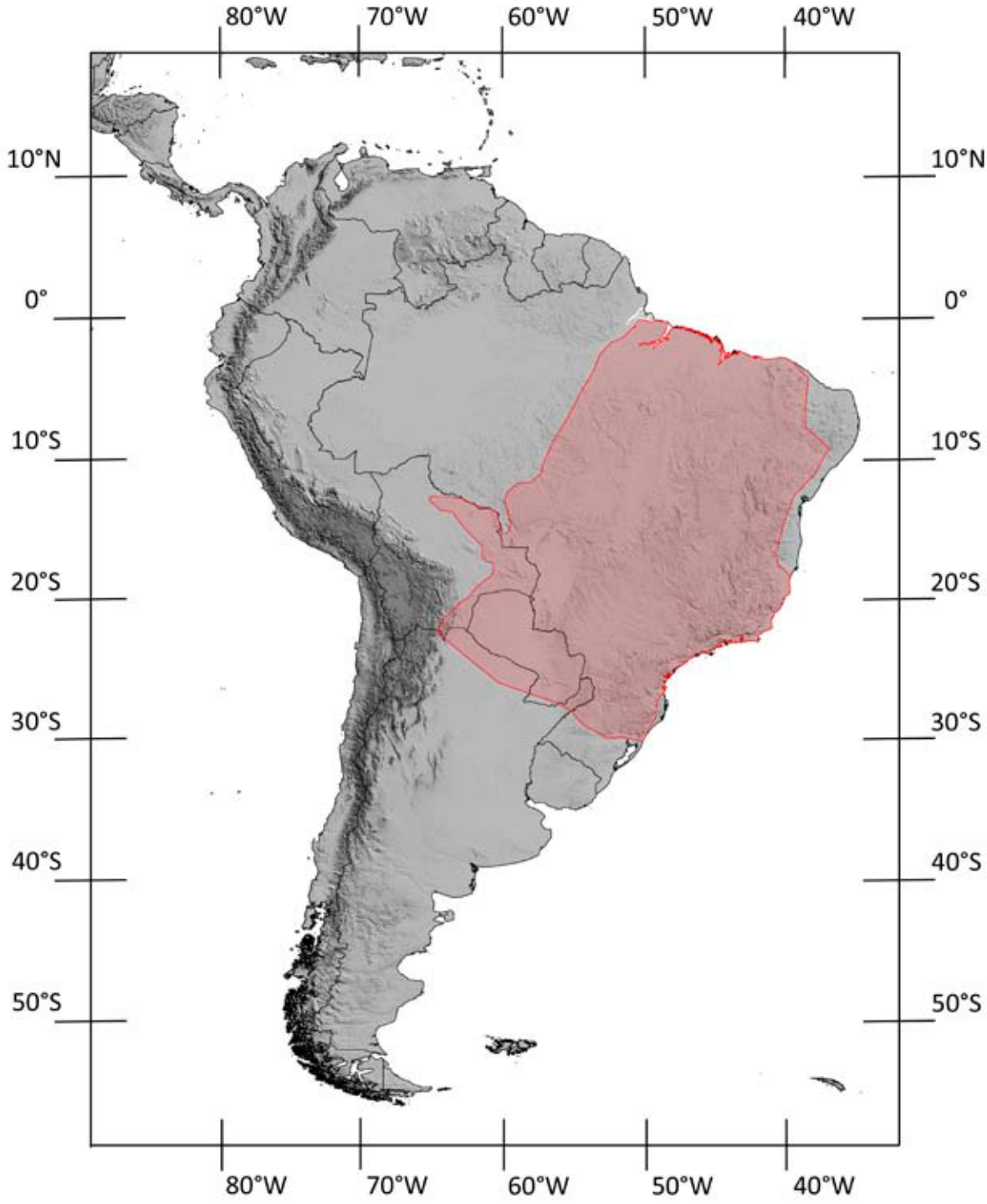

Figure 19. *Dasypus septemcinctus*. Based on Wetzel and Mondolfi (1979); Wetzel (1982); Redford and Eisenberg (1992); Anderson (1997); Emmons and Feer (1997); Gardner (2005); Vizcaíno *et al.* (2006); Abba and Vizcaíno (2008); Aguiar and Fonseca (2008); Smith (2009).

Dasypus yepesi

Data Deficient (DD)

Camera trap photograph: Fundación ProYungas/Ledesma

Common Names: Yunga's lesser long-nosed armadillo (English), Yepes's mulita (English), mulita de Yepes (Spanish).

Assessment Rationale: *D. yepesi* is listed as Data Deficient as there is no information on its population status and no knowledge of major threats.

Taxonomic Note: *D. yepesi* was named by Vizcaíno (1995) and includes specimens previously assigned to *Dasypus mazzai*, *D. hybridus, D. septemcinctus,* and *D. novemcinctus*. Morphological and genetic studies are needed to clarify the taxonomic status of this species.

Geographic Range: It is only known from Jujuy and Salta Provinces, Argentina (Vizcaíno, 1995; Fig. 20). Its range may extend into Bolivia and/or Paraguay. It has been recorded at elevations between 450 and 1800 m asl. The extent of occurrence is estimated at 22,000 km^2 but no information is available on the area of occupancy. Due to the lack of field studies on this species, no more than nine locations are known.

Population: There is no information on the population status of *D. yepesi*.

Habitats and Ecology: *D. yepesi* appears to be tolerant of a variety of ecological conditions from xeric habitats to humid montane forest (Vizcaíno, 1995; Vizcaíno and Giallombardo, 2001; Aguiar and Fonseca, 2008). There is ongoing deforestation in the range of this species.

Threats: The threats to *D. yepesi* are not known, but it can be assumed that it is used as a protein source and habitat destruction is affecting it negatively.

Conservation: *D. yepesi* has been recorded in the National Parks Calilegua and El Rey.

Assessors: Vizcaíno, S.F. and Abba, A.M.

Evaluators: Loughry, J. and Superina, M.

Contributor: Vizcaíno, S.F.

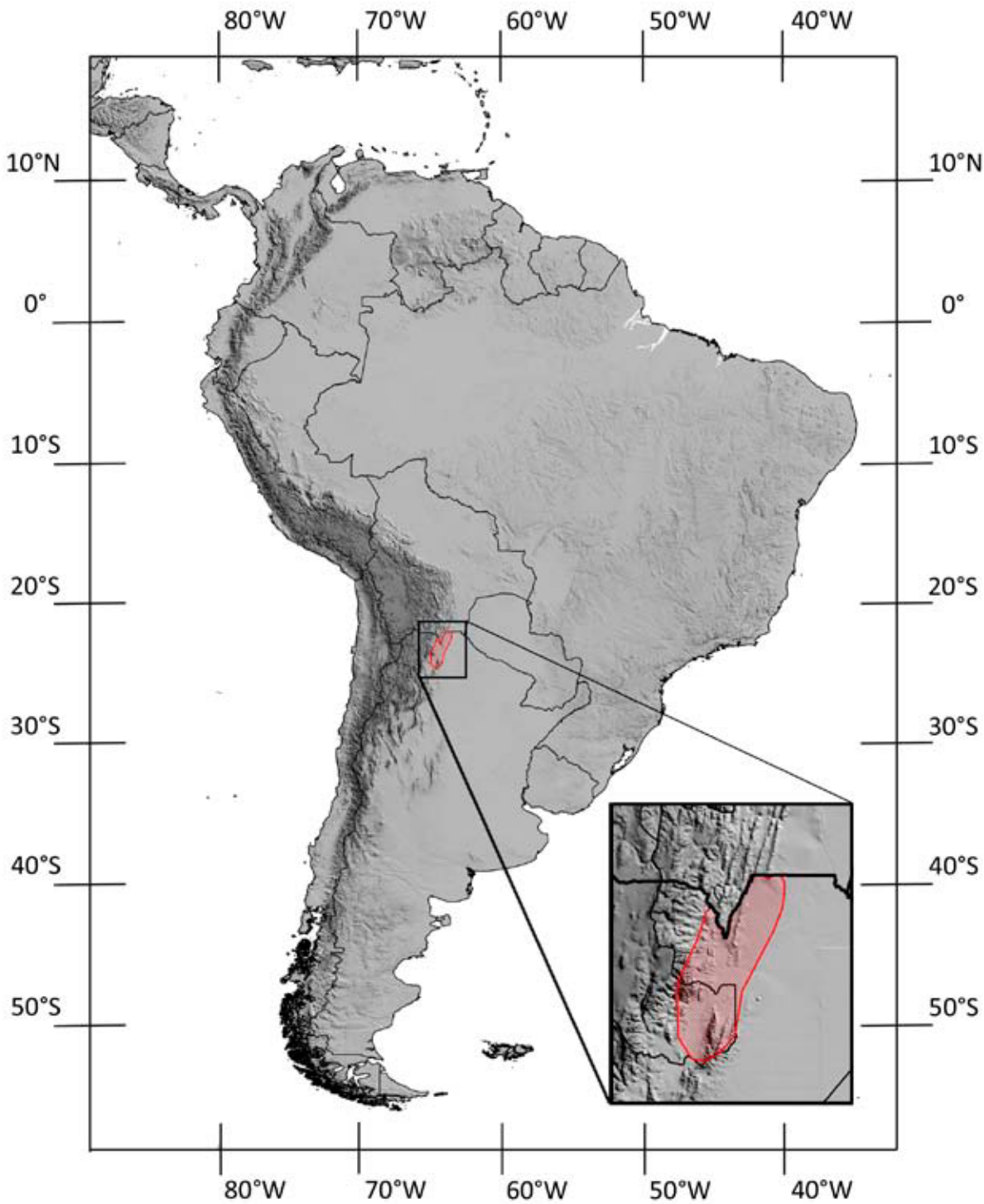

Figure 20. *Dasypus yepesi*. Based on Vizcaíno (1995); Vizcaíno and Giallombardo (2001); Gardner (2005); Aguiar and Fonseca (2008); A. M. Abba, pers. comm. (2009); Fundación Pro Yungas, pers. comm. (2009); S. F. Vizcaíno, pers. comm. (2009).

Euphractus sexcinctus

Least Concern (LC)

Photograph: Flávia Miranda

Common Names: Six-banded armadillo (English), yellow armadillo (English), gualacate (Spanish), tatupeba (Portuguese).

Assessment Rationale: *E. sexcinctus* is listed as Least Concern in view of its wide distribution, presumed large population, its occurrence in a number of protected areas, 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.

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

Geographic Range: *E. sexcinctus* is present in a wide area of South America, from southern Suriname and adjacent Brazil to Bolivia, Paraguay, Uruguay, and northern Argentina (Fig. 21). It does not occur in Buenos Aires Province (Flores *et al.*, 2009). For over 20 years, it was thought that a disjunct population of this taxon existed on the border between Brazil and Suriname (Wetzel, 1985). However, recent studies in northern Brazil confirmed the occurrence of *E. sexcinctus* in Maranhão, Amapá, and parts of northern, northwestern, central, and eastern Pará (see Fig. 21 for references). Most of these records are located in the cerrado. The presence of this species in Peru needs to be confirmed.

Population: It is a common species (Redford and Wetzel, 1985).

Habitats and Ecology: *E. sexcinctus* is found in open areas, savannas, shrubland and dry, semi-deciduous forest. It can be found in secondary forests, and may also occur in primary Amazonian forest (Redford and Wetzel, 1985). Males and females reach maturity at one year of age, and the females possibly give birth to several litters per year; litter size is one to three young.

Threats: There are no major threats. However, *E. sexcinctus* is hunted extensively, mostly for local use.

Conservation: *E. sexcinctus* is present in many protected areas.

Assessors: Medri, I.M. and Superina, M.

Evaluators: Abba, A.M. and Lima, E.M.

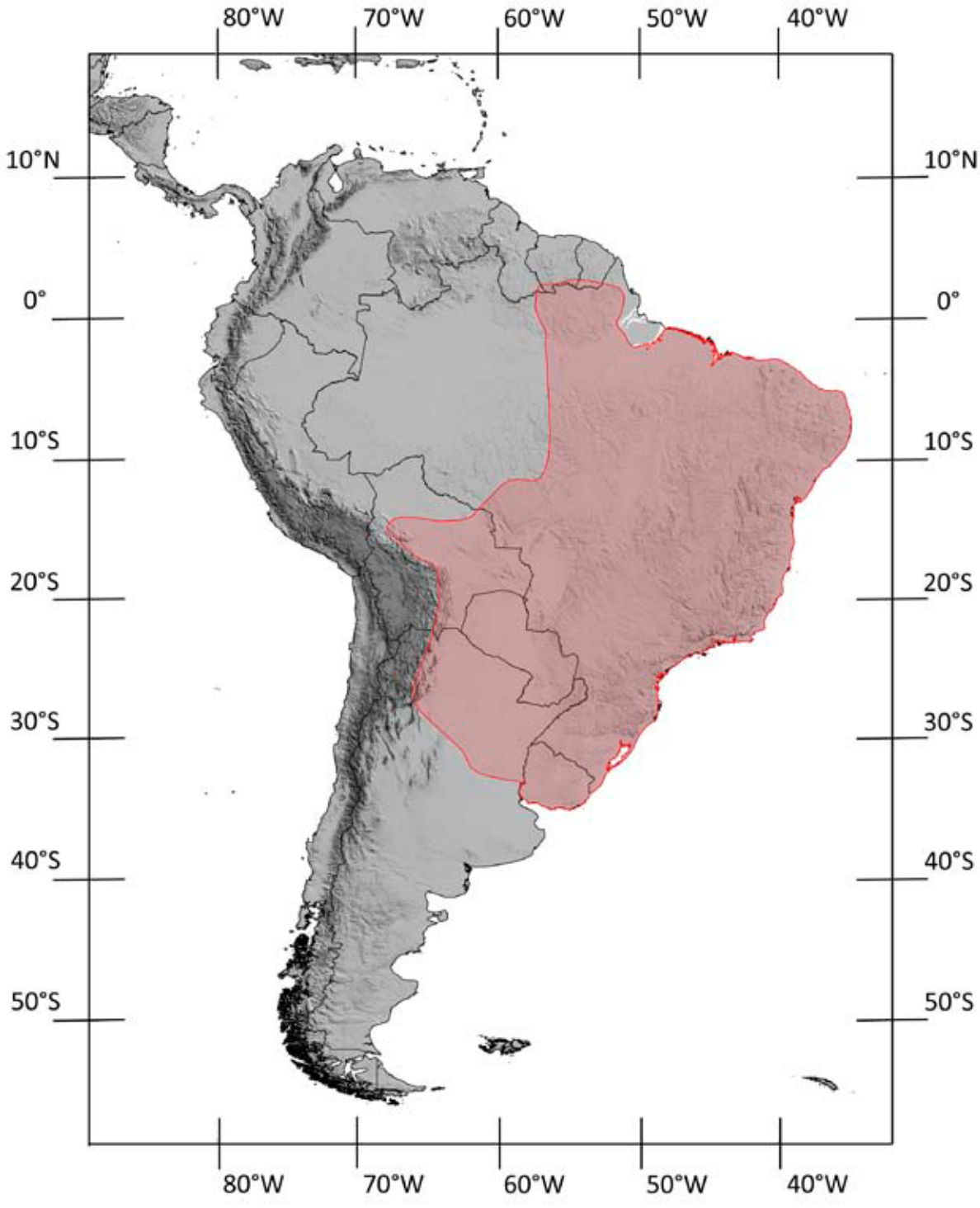

Figure 21. *Euphractus sexcinctus*. Based on Wetzel (1982); Redford and Wetzel (1985); Emmons and Feer (1997); Silva Júnior *et al.* (2001); Silva Júnior and Nunes (2001); Gardner (2005); Silva Júnior *et al.* (2005a, b); Andrade *et al.* (2006); Oliveira *et al.* (2006); Abba and Vizcaíno (2008); Aguiar and Fonseca (2008); Flores *et al.* (2009); Lima *et al.* (2009); A. M. Abba, pers. comm. (2009); Í. M. Medri, pers. comm. (2009).

Priodontes maximus

Vulnerable (VU A2cd)

Photograph: Mariella Superina

Common Names: Giant armadillo (English), tatú guazú (Spanish), tatú carreta (Spanish), armadillo gigante (Spanish), carachupa maman (Spanish), cuspón (Spanish), tatu-canastra (Portuguese), tatou géant (French).

Assessment Rationale: *P. maximus* is listed as Vulnerable because, although widespread, it is rare over its entire range. Estimates for population declines based on habitat loss and hunting are at a level of at least 30% in the past three generations.

Geographic Range: *P. maximus* ranges from northern Venezuela (east of the Andes) and the Guianas (French Guiana, Guyana, and Suriname) south to Paraguay and northern Argentina (Fig. 22). Srbek-Araujo *et al.* (2009) recently confirmed its presence in Espírito Santo, Brazil, although the populations in southeastern Brazil seem to be very reduced. The species may be extinct in Uruguay, and is not listed at all for this country by Fallabrino and Castiñeira (2006). It has been recorded from sea level up to 500 m asl. The extent of occurrence is approximately 9,750,000 km² but no information is available on the area of occupancy. This species has disappeared from large parts of its southern range, and possibly from other portions of its range.

Population: *P. maximus* appears to be naturally rare where it occurs, with a very patchy distribution. Surveys in Suriname over an 18-year period recorded seven individuals in an area of 650 km² (Walsh and Gannon, 1967). The density has been estimated to be from 5.77 to 6.28 per 100 km² using camera trapping (Noss *et al.,* 2004). The wild populations are decreasing.

Habitats and Ecology: This terrestrial species is found close to water within undisturbed primary rain forest habitats. It excavates burrows, usually in grasslands or open areas of the forest. Nowak (1999) suggested that the species had declined by at least 50% over the last decade. In 1954, three individuals were found in an area of 16.7 km² in Espírito Santo, Brazil (Ruschi, 1954). Home range size has been estimated to be at least 450 ha in Brazil (Carter and Encarnação, 1983). There is ongoing deforestation in the range of this species.

Threats: *P. maximus* is threatened by hunting for meat (generally for subsistence) and deforestation of habitat. The illegal capture of giant armadillos for clandestine sale to wealthy animal collectors may also be a threat, but is difficult to quantify.

Conservation: *P. maximus* is listed on Appendix I of CITES. It is present in many protected areas. There is a need to decrease hunting pressure and maintain habitat where viable populations occur.

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

Evaluators: Porini, G. and Anacleto, T.C.S.

Contributors: Porini, G., Anacleto, T.C.S., Medri, I.M., Miranda, F. and Cuéllar, E.

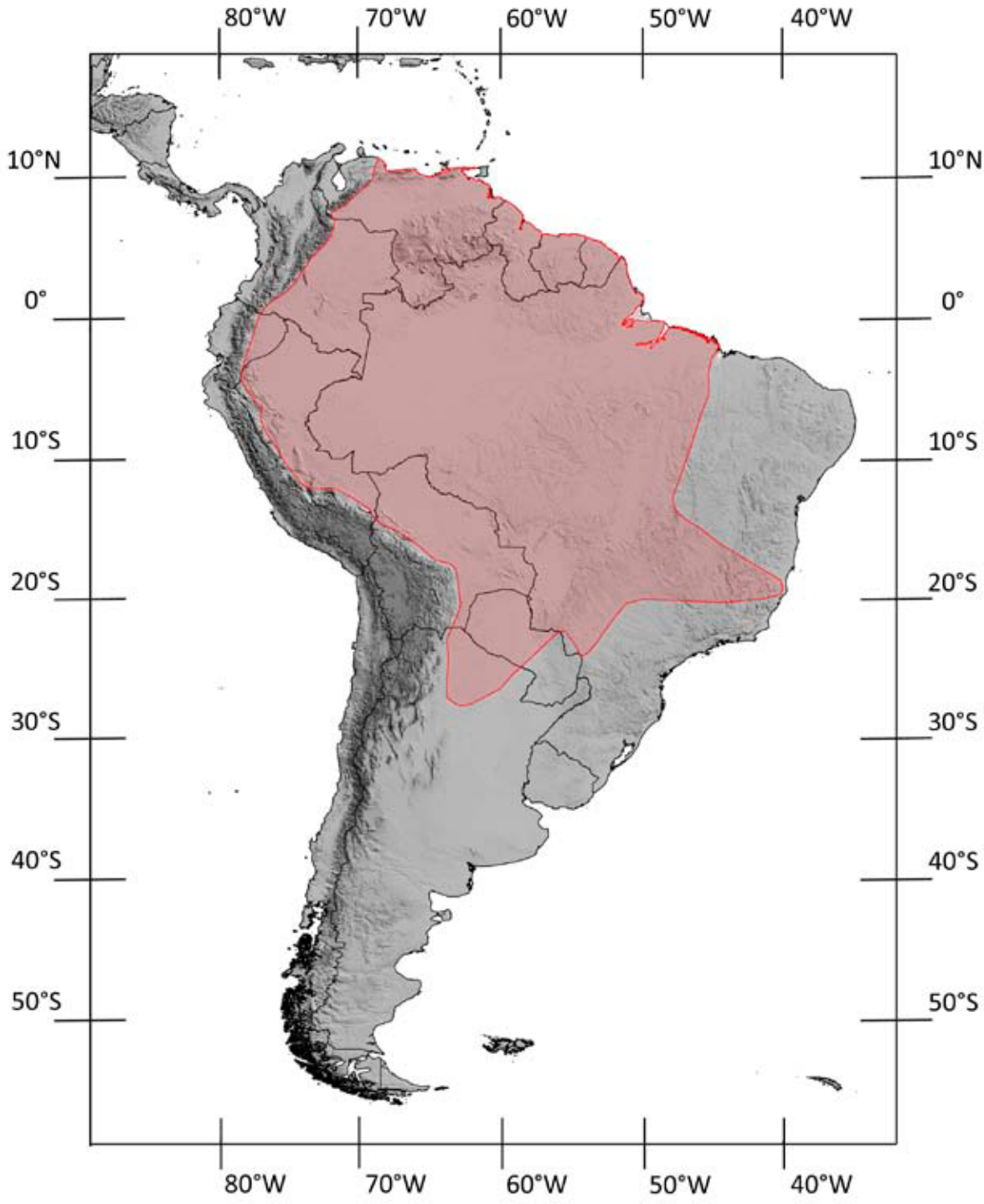

Figure 22. *Priodontes maximus*. Based on Ruschi (1954); Walsh and Gannon (1967); Wetzel (1982); Redford and Eisenberg (1992); Chebez (1994); Emmons and Romo (1994); Pacheco *et al.* (1995); Mares *et al.* (1996); Anderson (1997); Emmons and Feer (1997); Tirira (1999); Engstrom and Lim (2000); Gardner (2005); Fallabrino and Castiñeira (2006); Vizcaíno *et al.* (2006); Tirira (2007); Aguiar and Fonseca (2008); Srbek-Araujo *et al.* (2009); Tarifa (2009b); A. M. Abba, pers. comm. (2009); C. B. Kasper, pers. comm. (2009); Í M. Medri, pers. comm. (2009) ; G. Porini, pers. comm. (2009).

Tolypeutes matacus

Near Threatened (NT)

Photograph: Erika Cuéllar

Common Names: Southern three-banded armadillo (English), corechi (Spanish), tatú bolita (Spanish), mataco bola (Spanish), quirquincho bola (Spanish).

Assessment Rationale: *T. matacus* is listed as Near Threatened because this species is probably in significant decline (albeit at a rate of less than 30% over ten years) due to widespread habitat loss through much of its range, and because of exploitation for food, thus making it close to qualifying for Vulnerable under criterion A2cd.

Geographic Range: It is found from eastern Bolivia and south-western Brazil, south through the Gran Chaco of Paraguay, to Argentina (San Luis Province; Fig. 23). The species was once present in southern Buenos Aires Province (Yepes, 1928) but recent surveys suggest that it is now extinct in this area (Abba and Vizcaíno, 2008; A.M. Abba, pers. comm., 2010). The reason for its disappearing from Buenos Aires is unknown, but may be related to climate. It ranges from sea level up to 800 m asl (Argentina). The extent of occurrence is approximately 1,200,000 km^2 but no information is available on its area of occupancy.

Population: It is abundant in most xeric parts of the Paraguayan Chaco (Redford and Eisenberg, 1992). It was recorded at densities of 1.9 animals per km^2 in the Bolivian Chaco (Cuéllar, 2002). The wild populations are decreasing, mainly due to intense hunting and habitat loss throughout its range.

Habitats and Ecology: *T. matacus* is found in areas of dry vegetation within the Chaco (Bolkovic *et al.*, 1995). It has a low reproductive rate. Both genders reach maturity at one year of age. Females give birth to one yearly litter of one young, and gestation length is between 104 and 116 days.

Threats: *T. matacus* is threatened by hunting for food. As it is not fossorial, it is easier to hunt than other armadillo species. It is also threatened by habitat destruction through conversion of suitable habitat to cultivated land; however, it is able to adapt to low levels of agricultural disturbance. This species is exported to zoos and for pet trade, and there is a high mortality of individuals during this export process.

Conservation: *T. matacus* has been recorded from a number of protected areas. There is a captive population in North America.

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

Evaluators: Howell, J., Rogel, T. and Agüero, J.

Contributors: Medri, I.M., Miranda, F., Moraes Tomas, W. and Rogel, T.

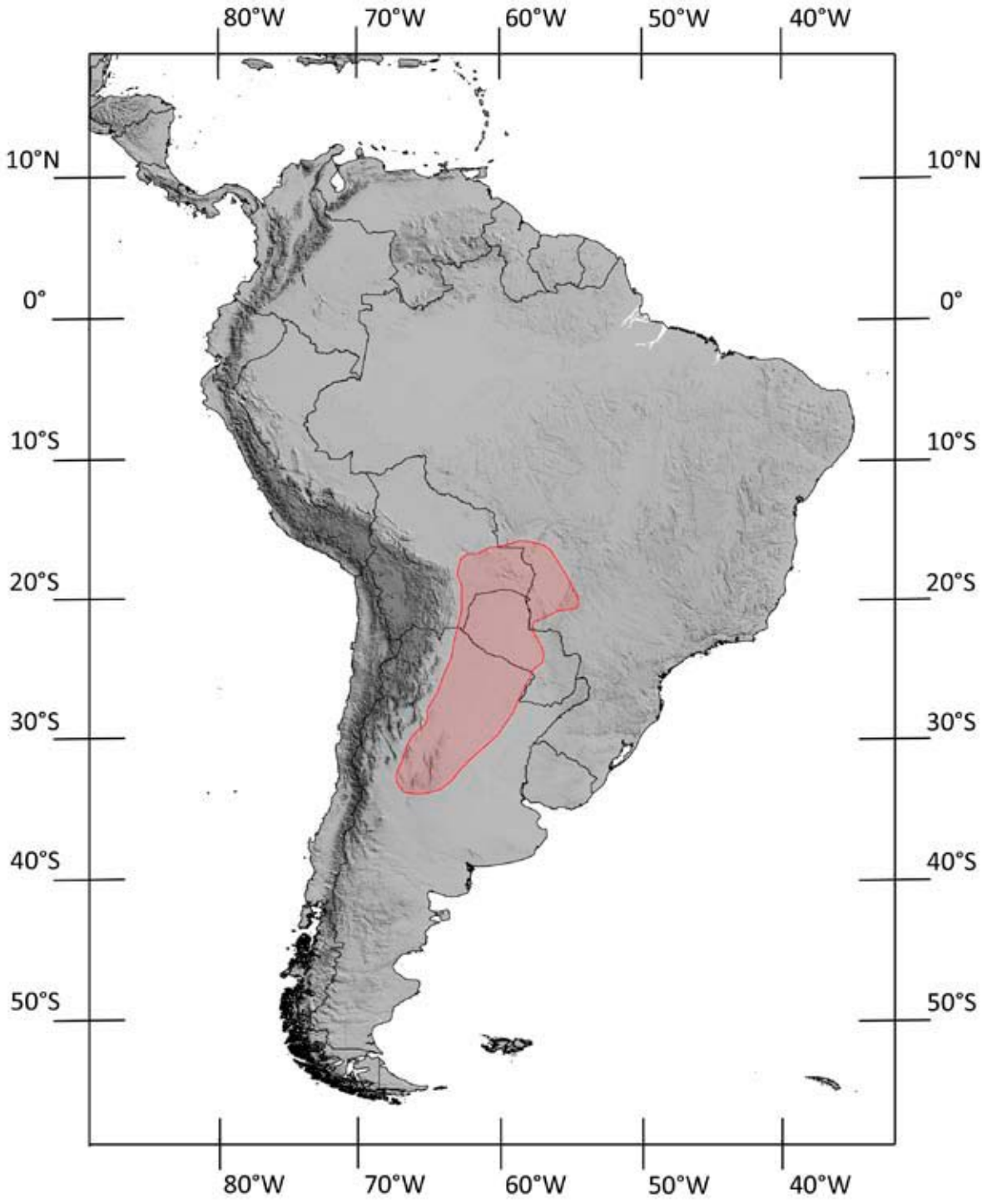

Figure 23. *Tolypeutes matacus*. Based on Redford and Eisenberg (1992); Gardner (2005); Abba and Vizcaíno (2008); Aguiar and Fonseca (2008); Smith (2009); Tarifa (2009a); A. M. Abba, pers. comm. (2009); Í. M. Medri, pers. comm. (2009); T. Rogel, pers. comm. (2009).

Tolypeutes tricinctus

Vulnerable (VU A2cd)

Photograph: Joares May

Common Names: Brazilian three-banded armadillo (English), tatu-bola (Portuguese).

Assessment Rationale: *Tolypeutes tricinctus* is listed as Vulnerable because of a population decline — estimated to be more than 30% over the last 10–12 years — inferred from ongoing exploitation and habitat loss and degradation.

Geographic Range: *T. tricinctus* is endemic to Brazil, where it has been recorded from the states of Bahia, Ceará, Pernambuco, Alagoas, Sergipe, Piauí, Mato Grosso (extreme central eastern portion), Goiás (extreme north), Minas Gerais (extreme northwest), Tocantins (eastern portion), Paraíba, and Rio Grande do Norte (Fig. 24). The extent of occurrence is approximately 700,000 km^2 but no information is available on the area of occupancy. Continuing declines in the areas of occurrence and occupancy are probable due to habitat loss.

Population: *T. tricinctus* was believed to be extinct until its rediscovery in the early 1990s in a handful of scattered localities. It has probably disappeared over much of its range, but it is difficult to survey its populations (Nowak, 1999). This armadillo has a patchy distribution; population densities may be relatively high within certain patches (J. Marinho-Filho, pers. comm., 2010), except in areas where the species is exposed to human pressure.

Habitats and Ecology: *T. tricinctus* mainly occurs in caatinga habitat (dry thorn scrub of north-eastern Brazil), but it is also found in the eastern parts of cerrado habitat (bush savanna in central Brazil). It is not fossorial and has the habit, when threatened, of rolling into an easily portable ball. Population densities have been estimated at 0.97 individuals/km^2 but are expected to be considerably lower in areas with hunting pressure. Significant habitat loss has been recorded in its range, especially in the Cerrado.

Threats: *T. tricinctus* is threatened by heavy hunting pressure and habitat loss. In the Caatinga, the remaining populations are practically isolated in protected areas and are subjected to subsistence hunting. In the Cerrado, the main populations live outside protected areas and are especially threatened by conversion of their natural habitat to sugar cane and soybean plantations.

Conservation: T. tricinctus has been observed in Serra da Capivara and Serra das Confusões National Parks, both in southern Piaui (Marinho-Filho and Reis, 2008). It is present in the Grande Sertão Veredas National Park, northern Minas Gerais (M. L. Reis, pers. comm., 2010). It was also recorded in the Ecological Station of Serra Geral do Tocantins and Jalapão State Park (Tocantins), as well as in the Raso da Catarina Biological Reserve and Veredas do Oeste baiano Wildlife Refuge (Bahia; Marinho-Filho and Reis, 2008; M. L. Reis, pers. comm., 2010). No protected areas exist in the area of highest population density (J. Marinho-Filho, pers. comm., 2010).

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

Evaluators: Marinho Filho, J. and Reis, M.

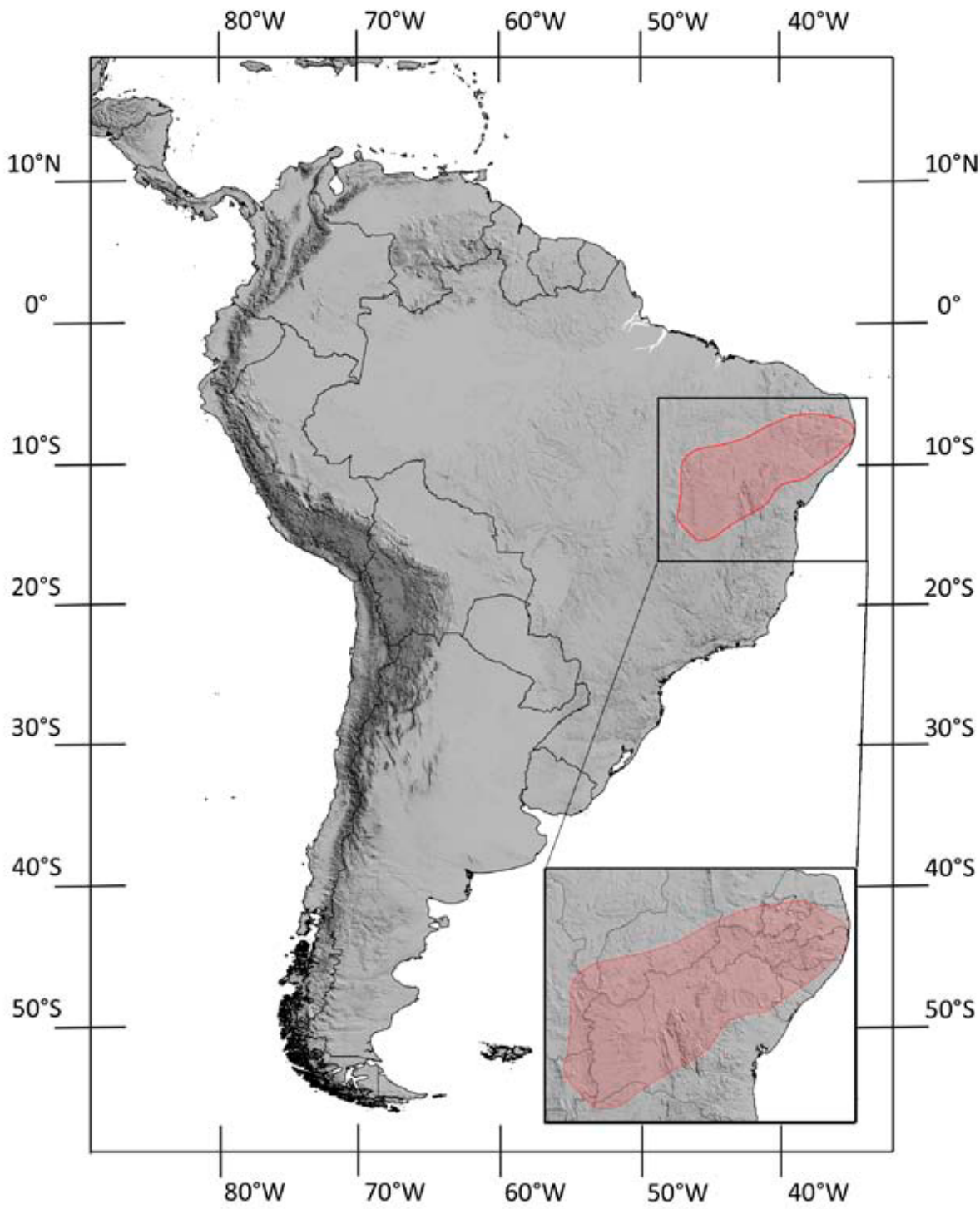

Figure 24. *Tolypeutes tricinctus*. Based on Sanborn (1930); Wetzel (1982); Wetzel (1985); Santos (1993); Silva and Oren (1993); Santos *et al.* (1994); Marinho-Filho *et al.* (1997); Eisenberg and Redford (1999); Reis *et al.* (2002); Reis *et al.* (2005); Gardner (2007); Marinho-Filho and Reis (2008).

Zaedyus pichiy

Near Threatened (NT)

Photograph: Mariella Superina

Common Names: Pichi (English), piche (Spanish).

Assessment Rationale: *Z. pichiy* is listed as Near Threatened because, although relatively widespread and present in a number of protected areas, it is hunted significantly, especially in northern and eastern portions of its range. Local extinctions have been recorded in some areas, although there is little known about the declines in the southern part of its range. Across its range, the species is thought likely to have undergone a decline on the order of 20% over the past ten years or so. It almost qualifies as Threatened under criterion A2d.

Taxonomic Note: Two subspecies are described but require confirmation: *Z. p. pichiy* and *Z. p. caurinus* (Gardner, 2007).

Geographic Range: *Z. pichiy* ranges from central Argentina and eastern Chile south to the Straits of Magellan (Fig. 25). It is found from sea level to 2,500 m asl. The extent of occurrence is approximately 1,300,000 km^2 but no information is available on its area of occupancy.

Population: *Z. pichiy* is not abundant in southern Buenos Aires Province (A.M. Abba, pers. comm., 2004), and its abundance has declined in Mendoza Province within the last ten years (M. Superina, pers. comm., 2004). No data are available on the population size. However, a population reduction of 20% in the past ten years is probable. The negative impact on wild populations has not ceased, and an ongoing decline in mature individuals is probable.

Habitats and Ecology: This mostly solitary species is found in xeric grasslands and shrublands, as well as Patagonian steppe habitats, always with sandy soils (including volcanic soil; Superina, 2008). It can be found in some degraded habitats. Suitable habitat is declining. Animals have a relatively large home range within their arid habitat. Both genders reach maturity at nine months of age, and the female gives birth to one yearly litter of one or two young after a gestation length of 60 days (Superina and Jahn, 2009; Superina *et al.*, 2009a).

Threats: *Z. pichiy* is threatened by hunting for food and sport, including hunting with dogs. An epidemic of an unknown disease has locally affected the species in some areas, and appears to be associated with rainy periods (Superina *et al.*, 2009b). It is threatened to some degree by overgrazing of its habitat by cattle.

Conservation: *Z. pichiy* is present in many protected areas, such as the National Parks Bosques Petrificados, Los Glaciares, Laguna Blanca, Lihué Calel, and Monte León. Hunting of this species in Argentina and Chile continues, even though this is prohibited.

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

Evaluators: Seitz, V. and Roig, V.G.

Contributor: Roig, V.G.

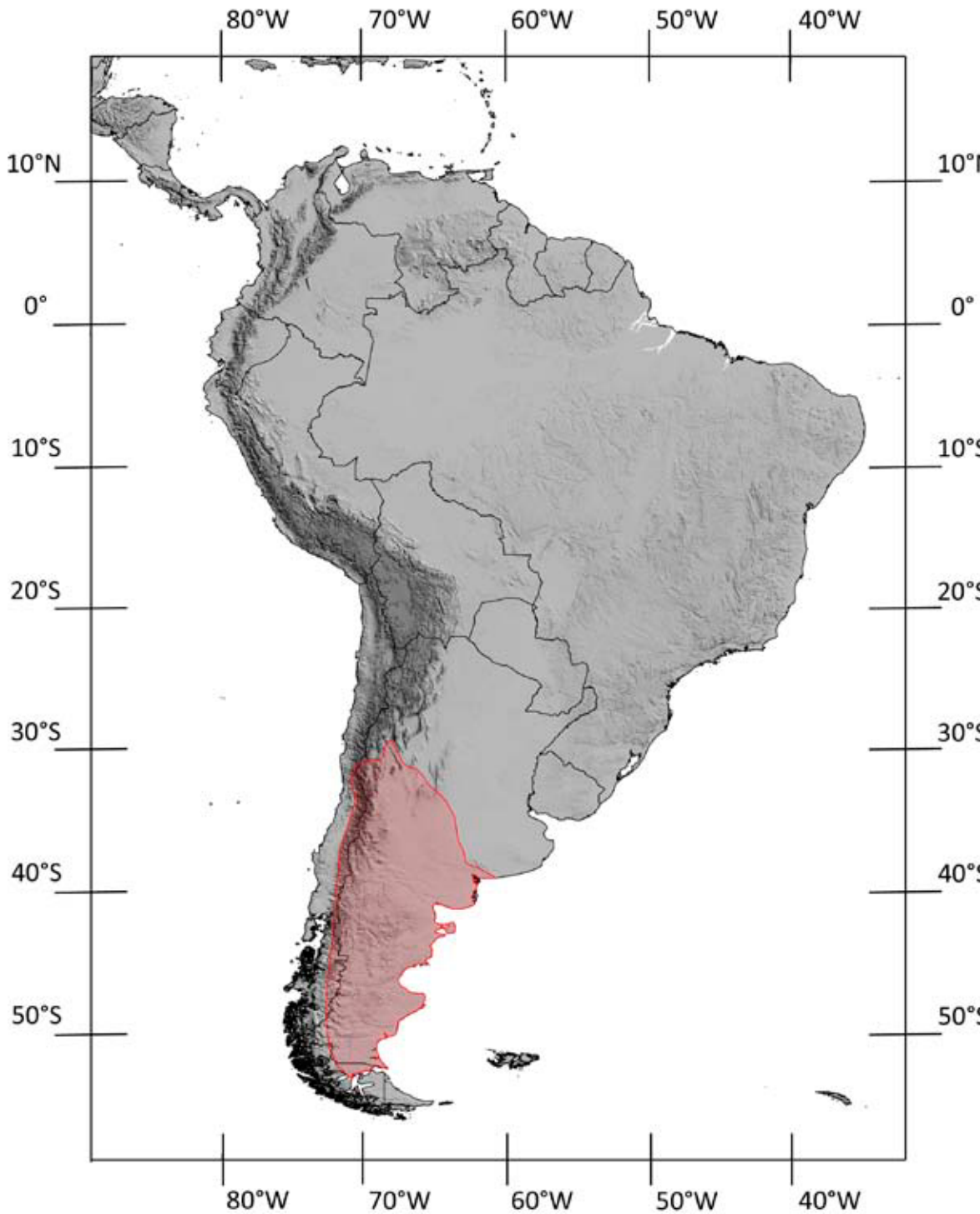

Figure 25. *Zaedyus pichiy*. Based on Wetzel (1982); Redford and Eisenberg (1992); Gardner (2005); Vizcaíno *et al*. (2006); Iriarte (2008); Abba and Vizcaíno (2008); Aguiar and Fonseca (2008); A. M. Abba, pers. comm. (2009); M. Superina, pers. comm. (2009).

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