

Species Summaries and Species Discussions

Author: Aguiar, John M.

Source: Edentata, 2004(6) : 3-26

Published By: IUCN/SSC Anteater, Sloth and Armadillo Specialist Group

URL: <https://doi.org/10.1896/1413-4411.6.1.3>

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

Species Summaries

The following summaries provide an overview of the geographic distribution and conservation status of the thirty-one recognized edentate species, as agreed upon by the participants of the Edentate Species Assessment Workshop. These summaries represent the consensus view for each species based on the most current information available from the field, combined with recently published distributions and assessments. New data are continually made available, however, and we encourage anyone who has made sightings or field observations of any of these species to contact the Edentate Specialist Group, and to submit a note for publication in a future issue of *Edentata*.

The names listed with each species are those participants who were the primary contributors to its assessment. The species are presented here in the order in which they were considered during the workshop, and no particular taxonomic scheme is implied in their arrangement.

Bradypus torquatus - EN

Adriano Chiarello, Paula Lara-Ruiz

Bradypus torquatus is separated into three isolated and genetically distinct populations, each homogeneous within itself but strongly demarcated from the others – to the extent that the northernmost population, in Bahia, is potentially a distinct subspecies. These differences may reflect divisions dating from the Pleistocene or earlier. Maned sloths appear to be relatively abundant in southern Bahia and in parts of Espírito Santo, but their local density is unpredictable and varies widely between sites. They are present in a number of protected areas, but the total area of forest fragments supporting these sloths is likely well below 5000 km². Any efforts for population management should recognize and preserve the unique genetic character of the three separate populations.

Bradypus tridactylus - LC

Adriano Chiarello

Bradypus tridactylus is found in a broad area across the Guyana Shield, perhaps extending to Colombia. Although threatened by general forest loss, it remains locally abundant and widespread throughout pristine regions of the Amazon, and occurs in many protected areas.

Bradypus variegatus - LC

Adriano Chiarello

Bradypus variegatus occurs across an immense area of Central and South America, although it has been extinct from Argentina since 1916. Its vast range may cover cryptic species or unrecognized populations, and the fine taxonomy of subspecies should be examined, as recent molecular studies suggest that certain populations may be genetically distinct. It is currently under no serious threat across its range as a whole.

Bradypus pygmaeus - CR

Rafael Samudio

The pygmy sloth is endemic to the mangrove forests of a single island off the northern coast of Panama. With a total area of 4.3 km², only 30% of which is covered by mangroves, the pygmy sloth has the most confined range of any known edentate, and its total population is probably no more than a thousand individuals. Although the island is not permanently inhabited, it is used as a base camp for seasonal divers and fishermen, who hunt the sloths at will. There is no presence of authority on the island and no enforcement of wildlife law, leaving the pygmy sloth with a complete absence of real protection.

Choloepus didactylus - LC

Dennis Meritt

Choloepus didactylus occurs across the Guyana Shield and the northern Amazon, extending to the eastern flanks of the Andes. It is common throughout its range, occurs in numerous protected areas, and is not considered to be threatened.

Choloepus hoffmanni - LC
Dennis Meritt

Hoffman's two-toed sloth is divided into two separate populations along the northern and central Andes; these populations may qualify as subspecies if their taxonomic status is studied in detail. The northern population is probably under threat from the severe habitat loss in Central America, but the more southerly population is assumed to be in no immediate danger.

Cyclopes didactylus - LC
Adriano Chiarello, Flávia Miranda, Rafael Samudio

The range of the silky anteater extends from southern Mexico across the entire Amazon basin, with an outrider population on the northeastern coast of Brazil that may be a distinct subspecies. That population is probably endangered, but the species as a whole is widespread and apparently adaptable to a variety of habitat types.

Myrmecophaga tridactyla - NT
Gustavo Porini, Anthony Rylands, Rafael Samudio

Although threatened by heavy hunting, highway mortality and agricultural fires, giant anteaters occupy an immense geographic range, and the previous listing of Vulnerable was considered inappropriate for such a widespread species. They are often rare in particular localities, however, and progressive habitat destruction may have isolated populations across their range.

Tamandua mexicana - LC
Dennis Meritt, Rafael Samudio

The Mexican tamandua is impacted by highway mortality, as well as fire, habitat conversion and loss, but these are not considered to be major threats. The species is widespread and well-represented in a number of protected areas, and is not thought to be in particular danger.

Tamandua tetradactyla - LC
Agustín Abba, Paula Lara-Ruiz

Lesser anteaters occur in a broad range of habitats from Colombia to northern Argentina, taking advantage of both open and forested areas. Fire and highway mortality may present a threat to local populations, as well as hunting in some regions, but the species as a whole is widespread and well-represented in protected areas.

Tolypeutes matacus - NT
Agustín Abba, Erika Cuéllar, Dennis Meritt, Gustavo Porini, Mariella Superina

Once present across a broader area of Argentina, this armadillo has lost habitat naturally – as the Chaco biome gradually contracted – and also to the more recent incursions of human agriculture. Although *Tolypeutes matacus* may prosper in areas of moderate agriculture, too much habitat loss will still have a damaging effect. Its reproductive rate is slow and it is heavily hunted, both for food and for export to other countries.

Tolypeutes tricinctus - VU
Adriano Chiarello, Gustavo Fonseca

Once thought to be extinct, *Tolypeutes tricinctus* was rediscovered in 1990 and is now known from a broad wedge of northeastern Brazil. Hunting and habitat destruction are major threats to this species, and it is not well represented in protected areas. In addition, its population has almost certainly dropped more than 30% in the past decade.

Cabassous centralis - DD
Paula Lara-Ruiz, Rafael Samudio

One of the most fossorial armadillos, *Cabassous centralis* is selective in its diet and notably insectivorous. It prefers dry to mesic forests, but now exists mainly in patchy, degraded habitat, and it is considered rare wherever it occurs. The lack of other information favors the Data Deficient category, which may help to stimulate further research on this species.

Cabassous chacoensis - NT

Agustín Abba, Dennis Meritt, Gustavo Porini

This species occupies a small area in the midst of the Chaco, occasionally found in Paraguay and northernmost Argentina, but never in Bolivia. It is hunted for subsistence throughout its small range, appears to be extremely rare, and reportedly avoids degraded areas. Its remaining habitat is quickly being destroyed, but it has at least nominal protection in the Defensores del Chaco National Park. At present there is no information to confirm that its population has dropped past any critical thresholds.

Cabassous tatouay - LC

Gustavo Porini

This species is widespread across central and southern Brazil; its primary habitat is forest, and it will tolerate secondary habitat, but not degraded or agricultural lands. It is often difficult to see, and widely hunted, but it is locally common and present in a number of parks and protected areas in Brazil.

Cabassous unicinctus - LC

Erika Cuéllar

Cabassous unicinctus is much like *C. tatouay*, with similar habitat requirements and ecology. There may be two subspecies, one centered in the Guyanas and the other in the Cerrado. Although hunting is a serious threat, and habitat loss is also a concern for the Cerrado populations, the species is broadly distributed and common throughout.

Chaetophractus nationi - VU

Erika Cuéllar, Agustín Abba

Found in the Bolivian Andes and a short distance beyond, *Chaetophractus nationi* reaches altitudes up to 3500 m; it occurs in the Andean puna, where it is at some risk from the destruction of that rare biome. But the greater threat to this species comes from the heavy harvest of their shells for *charangos*, small guitarlike instruments which are popular in Andean culture and sold in great

numbers for the tourist trade. Although listed as endangered in Bolivia, there is no adequate legal protection, and hunting has become intense enough to easily reduce the total population by more than 30% in the past decade.

Chaetophractus vellerosus - LC

Erika Cuéllar, Dennis Meritt, Agustín Abba

This species occurs mainly in northern Argentina, where it is heavily hunted to provide raw materials for the guitarlike *charangos*. Although they are extremely sensitive to soil disturbance, they also appear to thrive in newly cultivated fields, where they feed on insects. They are often hunted as agricultural pests, but in some areas their numbers have shown a visible increase in the past five years, and they are not considered to be in immediate peril.

Chaetophractus villosus - LC

Adriano Chiarello, Erika Cuéllar, Dennis Meritt, Gustavo Porini, Agustín Abba

This species occurs throughout Argentina and the Chaco of Paraguay, where they are hunted for local subsistence and by domestic dogs. Despite this, the species is widespread and relatively common.

Chlamyphorus (Calyptophractus) retusus - NT

Sergio Vizcaíno, Agustín Abba, Gustavo Porini, Mariella Superina, Erika Cuéllar, Dennis Meritt

This species is restricted to sandy, loose soils in the central Chaco of Bolivia and Paraguay. Although there are no firm population estimates, it is extremely rare throughout its small range. In addition, it is relentlessly persecuted by local people, in whose lore it is considered an evil apparition which must be killed on sight. The intensity of this pressure on a rare and near-endemic species is certain to have severe effects on its population.

Chlamyphorus truncatus - NT

Sergio Vizcaíno, Gustavo Porini, Mariella Superina

Endemic to central Argentina, the pink fairy armadillo lives in sandy plains, dunes and scrubby grassland. They are nocturnal, fossorial, and exceptionally difficult to observe, and thus no data exist on their population dynamics. Although they are not hunted by humans, they are preyed on by domestic cats. They are known from several protected areas, but much of their former habitat has been severely degraded, and they must certainly be affected by the pesticides and fertilizers in heavy use all around them.

Zaedyus pichiy - NT

Mariella Superina

One of the southernmost of all edentates, the pichi is found across a wide area of central Argentina and Patagonia, but restricted to arid regions within. There is a strong human presence throughout its range, and much of its habitat has been severely degraded or converted for agriculture. Pichis are hunted intensively and illegally, both for food and for sport, while highways take a steep toll with roadkill as well.

Dasypus hybridus - NT

Agustín Abba, Paula Lara-Ruiz, Sergio Vizcaíno

This species is extremely susceptible to anthropogenic land change and general human activity, both of which have affected its range. They were known to have been more widespread thirty years ago, but severe hunting – combined with agricultural expansion – has caused a rapid decline.

Dasypus kappleri - LC

Teresa Anacleto, Erika Cuéllar

Ranging across a wide area of the northern Amazon and Guyana Shield, this species prefers forest patches within a savanna matrix. Although there are no data on its populations, it occurs in

numerous protected areas, and is not believed to be under unusual hunting pressure.

Dasypus novemcinctus - LC

all participants

The nine-banded armadillo is the most widespread and abundant of any living edentate, and the only one to have successfully expanded into the heart of North America. Although commonly hunted, it is by no means threatened.

Dasypus pilosus - NE

Dennis Meritt, Gustavo Porini, Anthony Rylands

A final decision is still pending for this species, which is endemic to central Peru. It is found primarily in the Río Abiseo National Park, but is otherwise unknown.

Dasypus sabanicola - LC

Paula Lara-Ruiz

This species is found in a moderate region of east-central Colombia and central Venezuela, primarily in savanna habitat and associated gallery forest. It occurs in several national parks – although not the Gran Sabana – and is not considered to be under particular threat.

Dasypus septemcinctus - LC

Teresa Anacleto

Lack of pertinent information, more than any informed consideration, led to this species being classified as Least Concern. In central Brazil this species is common in pastures and natural open areas.

Dasypus yepesi - DD

Sergio Vizcaíno

Described in 1995 by Sergio Vizcaíno, this species is known only from the northwestern Argentine provinces of Salta and Jujuy. There are no data on its population size, and virtually no information on any other aspect of its biology.

Euphractus sexcinctus - LC
Erika Cuéllar

Tough and resilient, the yellow armadillo is widespread across much of southeastern Brazil, the Chaco and beyond. Heavily hunted in the Cerrado despite its notorious taste, this species remains resistant to human disturbance and is not considered threatened.

Priodontes maximus - VU
Erika Cuéllar, Dennis Meritt, Gustavo Porini

By far the largest of the armadillos, and perhaps of all the living edentates, the giant armadillo is also one of the widest-ranging. Everywhere it is found, it is hunted for its wealth of meat, and for some indigenous peoples it is their primary source of protein. Despite its broad distribution, its actual occurrence is rarefied and sporadic from site to site. Thinly spread throughout the Amazon, individuals are most likely to be found in the *llanos* of Guyana and the region surrounding the Chaco of Paraguay and Argentina. They are rarely found in altered landscapes.

Virtually nothing is known of its reproductive parameters; it has never reproduced in captivity, and the chances for success will not improve until a great deal more is learned about its social and reproductive behavior in the wild. Its overall population has dropped 30-50% in the past three decades, and it may have experienced a greater crash earlier in the century. Aside from being targeted for hunting wherever it exists, the giant armadillo is also frequently captured for trade on the black market, where the captives invariably die. As a locally rare and heavily persecuted species, the giant armadillo is considered to be vulnerable at the very least.

Species Discussions

This section summarizes the discussions which formed the core of the workshop and led to its final recommendations. Prepared from the notes of one of the organizers, this section is intended

to provide an insight into the dynamics and rationale of the assessment process. Arriving at a decision for each species required debate and consensus from all the participants, and some discussions were longer and more involved than others, depending on the information available and the expertise of the various field researchers. Different experiences from different regions sometimes led to contrasting opinions on the status of a species. These notes represent the perspective of one observer, and do not serve as the official minutes of the workshop.

Bradypus torquatus - EN
Adriano Chiarello, Paula Lara-Ruiz

There is a gap in the distribution of *Bradypus torquatus* in northern Espírito Santo. It no longer occurs in southern Sergipe – the forest is gone – but it has a stronghold in southeastern Bahia, in Ilhéus, Una and Itabuna. Although there are two large forest reserves in Espírito Santo, totaling perhaps 40,000 ha, the maned sloth has never been seen in either. Its second largest stronghold is in the mountains of Espírito Santo. There is no historical presence in the Caparaó National Park, but there are reports that IBAMA has been releasing confiscated individuals there. The third and smallest stronghold is in Rio de Janeiro, in the Biological Reserves of Poço das Antas and União.

According to Paula, maned sloths are also in the Desengano State Park, north of the city of Rio de Janeiro. In the early 1970s, there were reports of sloths near the city itself, but none have been seen in thirty years. Paula suggests they may occur in Pernambuco – their historic range may have extended that far. Chiarello says that Olivério Pinto made a comment on Wied's book, that he (Pinto) had seen a maned sloth in Pernambuco.

They are reported from just south of the Rio Mucuri; the gap in distribution runs from the left bank of the Rio Doce to the vicinity of the Mucuri. Their elevation ranges from sea level to 900-1000 meters. They are reported, but not verified, from the extreme northeast of Minas Gerais, on the left bank of the Rio Jequitinhonha.

Population size is difficult to guess, since we have only a crude estimate of their density; it's more feasible to sample with plots than a line-transect. According to Chiarello, they seem to be abundant in southern Bahia – in one day you can find 3–5 sloths in a five-kilometer transect. Paula says it depends: some areas don't have much forest, but many sloths, while other areas have a great deal of forest, but you can't find a single sloth. Apparently *Bradypus torquatus* has very little sympatry with *B. variegatus*; in more than 500 hours of fieldwork, Paula found over 60 maned sloths but not a single *B. variegatus*.

Paula sampled sloths in a number of areas: from Ilhéus, in the *município* of Una in southern Bahia; from the *municípios* of Santa Teresa, Aracruz, Santa Maria and Itarana in central Espírito Santo; and from the União and Poço das Antas Biological Reserves in Rio de Janeiro. She found three distinct populations with no gene flow among them, leading to major genetic differences among the populations, potentially species-level differences. IBAMA, however, has a triage center in southeastern Bahia, where sloths which have been confiscated from the wildlife trade are released without regard to their disparate origins. These populations may have been isolated since the Pleistocene, or earlier; they are distinct and individually homogeneous, with very low genetic diversity within each one, but major differences between all three. The high-altitude populations are physically larger than those at sea level. All confiscated animals are released in a single location: "Genetically damaging," says Rylands; "– dangerous," says Paula.

The northern population is genetically more distinct than the two southern ones, and it is potentially a new subspecies: this Bahian population is dramatically different, according to Paula's mtDNA testing, and she believes this separation is historical rather than the result of recent habitat fragmentation. Chiarello agrees with Rylands that the lack of animals in Espírito Santo may be related to the more deciduous forest there. *Bradypus torquatus* does not live in mangroves,

although it does occur in *restinga*, and it can survive in secondary as well as primary forest.

As for threats and conservation measures, the species is present in several reserves, with little genetic variation within specific populations; Rylands recommends that any plans for population management take these genetic issues into account. Sechrest reviews the Red List threat criteria, and says (a) and (b) are the main ones to consider. 20,000 km², or two million hectares, is the threshold for the Vulnerable category. União covers 3000 ha, and Poço das Antas has 5000 ha, but much of the habitat they protect is eucalyptus forest or grassland, and not optimal for sloths. 41,000 hectares, or 410 km² of protected areas – the largest areas of forest left. 5000 km² is the cutoff for Endangered status, and Fonseca and Rylands think it's likely under this amount. Paula notes there are many forest fragments without sloths, so category (a) could be appropriate.

Considering the criteria for population decline, Chiarello notes that a sloth generation spans five years, meaning 15 years for three generations. Most of the decline has been in Bahia, where vast areas of forest were destroyed in the 1980s – but Rylands says things are changing: in many areas, although there was a dramatic loss in the recent past, the situation is more stable now. Owing to the density of human populations, almost all the forest has been destroyed in the lowlands of Sergipe, Rio de Janeiro and Espírito Santo, where once the maned sloths were found. According to Chiarello, some consider this a separate genus; Paulo Couto suggested this in the mid-1970s, an opinion which others only repeated; but Fonseca is not convinced.

Bradypus tridactylus - LC
Adriano Chiarello

This species is found across the Guyana Shield, in northern Brazil, Venezuela, Guyana, French Guiana – and perhaps Colombia. There is one potential record from the Field Museum, from the Río Caquetá, which is of special note: FMNH

140254. (According to Rylands, this specimen is “enigmatic.”)

Rylands notes this species occurs just north of the Rio Negro, but extends only to the south of the Orinoco. It's not likely to be in savanna, which militates against much of south-central Venezuela as potential habitat. It is unlikely to occur in white-sand forest, the *caatinga alta*, which Rylands says is a much more “venomous” habitat in terms of phytotoxins – each leaf is an investment, and they have plenty of phenols and other secondary compounds, which would make it more difficult for a sloth to survive there.

The three-toed sloth is threatened by general forest loss, but there are no imminent threats, and it is found in a number of protected areas. The decision is for Least Concern, since it is widespread throughout pristine areas of the Amazon, and abundant in many locations.

Bradypus variegatus - LC
Adriano Chiarello

This species occurs over an immense area, but is now extinct in Argentina – the last sighting there was in 1916 – and its status in Paraguay is uncertain. Vizcaíno says there can't be a continuous extension from Misiones, since most of the forest there is secondary, and was modified in the last century. There are two subspecies in Venezuela. One value for density from Panama was 5-8 sloths/ha. The elevation ranges from 25-2300 m.

Rylands notes that with such a wide-ranging species, conservation measures should include a look at the genetics, to find cryptic species or unrecognized populations, and to examine the taxonomy at the subspecies level. According to Fonseca, the southernmost specimen known is from Londrina in Paraná. Chiarello notes that Cabrera mentions Rio Grande do Sul, but there is no specimen and this has not been verified. It could have reached northern Argentina through Paraná/Iguaçu, but it has been historically absent from Rio Grande do Sul and Santa Catarina. It prefers mesic/humid

tropical forest, although Samudio claims it may also be found in mangroves.

Choloepus didactylus - LC
Dennis Meritt

This species is geographically widespread; in Suriname, the density is given as 0.9 sloth/km², but Chiarello says this is an underestimate. Without more ado, it is declared Least Concern.

Choloepus hoffmanni - LC
Dennis Meritt

The northern population of Hoffmann's two-toed sloth occurs in the far northwestern corner of Venezuela, as well as the lower Colombian Andes, the Pacific coast of Colombia and up to Nicaragua and Honduras. The main issue is its discontinuous distribution, but according to Samudio and Meritt the same pattern shows up with other mammals. There is a need for survey work in the main lacuna, in eastern Ecuador and northeastern Peru. It is found in lowland and montane forests up to 7000 feet, and is uncommon in dry lowland forest. It reaches up to 3300 m altitude in Costa Rica. Its range also extends down in long fingers on either side of the Andes in northern Colombia. There is one specimen by Ávila-Pires listed from Aripuanã, in Mato Grosso, but this record is a dubious outlier. The species reaches into southwestern Acre.

According to Genoways and Timm (2003) there are actually two populations, and Fonseca feels the northern population is probably in bad shape, given the habitat loss in Central America. Fonseca wonders if we should consider these populations as two subspecies, given their separation; he says there should be studies on its taxonomic status. Sechrest wants a rationale for a listing: widespread, and the disjunct southern population is okay? Rylands notes that *Lagothrix lugens* is in the same area. Sechrest speculates that the two species of *Choloepus* are competing in one area, and Fonseca agrees.

Rylands points out that if the two populations are indeed distinct, then the nominate subspecies in the north would be Near Threatened due to habitat loss, since the southern population is thought to be doing better. Surveys should be undertaken in the upper Amazon and Peru.

Cyclopes didactylus - LC

Adriano Chiarello, Flávia Miranda, Rafael Samudio

There is an old record for *Cyclopes* from Alagoas, according to Rylands: Vieira (1955). Chiarello says we should ask Tabarelli if *Cyclopes* is in either Alagoas or Sergipe. Flávia Miranda believes *Cyclopes* is distinct in Recife, much lighter in color; but this lighter form is found only in Pernambuco, and nowhere else – not in Alagoas, Sergipe or Ceará. Samudio says there are no *Cyclopes* in El Salvador; they haven't been mentioned in the past few decades, or at least the last ten years. This fits a pattern, says Samudio, with what the Mexicans have found, and the Mexicans are very thorough in their surveys.

There are no *Cyclopes* in Paraguay; the southernmost record is in Alto Beni, in northern Bolivia. Silky anteaters prefer wet tropical forest and semi-deciduous forest, according to Chiarello, and are also found in *cerrado* vegetation. Meritt says they're found in "strange places," secondary growth, and the like – but not mangroves or freshwater swamps. In Panama the species reaches to 1500 m altitude. Rylands comments that there are most likely subspecies within its great range – and if the population in the Northeast were taxonomically distinct, it would be Critically Endangered. There isn't much forest left around Recife, only secondary forest, and Rylands believes that this population is highly endangered no matter what, owing to heavy forest destruction. Rylands classifies the species as a whole as Least Concern – widespread, but possibly with distinct subspecies.

Myrmecophaga tridactyla - NT

Gustavo Porini, Anthony Rylands, Rafael Samudio

The giant anteater is extinct in Uruguay, although they still exist to the north in Argentina's Misio-

nes province. They are heavily hunted throughout their range, especially from highways, and roadkill is a serious threat; they are also threatened by fires set for agriculture, and the regions where they occur need better fire management.

This species is a challenge for Red Listing: Vulnerable is not considered appropriate, so it is changed to Near Threatened – widespread, but rare, with internal factors affecting its listing. Some researchers will be annoyed when their species is downgraded, but this may actually stimulate more research, although Fonseca says this was not the rationale behind the change.

Tamandua mexicana - LC

Dennis Meritt, Rafael Samudio

Roadkill is a threat to this species, as well as fire and habitat change – but they are not major threats, and this species should occur in a number of protected areas. Fonseca notes there are some taxonomic issues with several subspecies, and it needs taxonomic revision. Since it is widely-distributed and well-protected, the final vote is Least Concern.

Tamandua tetradactyla - LC

Agustín Abba, Paula Lara-Ruiz

Lesser anteaters are widely distributed from Colombia to northern Argentina. They are threatened by fire and highway strikes, as well as hunting in some areas, but overall the species is widespread and well-represented in protected areas.

Tolypeutes matacus - NT

Agustín Abba, Erika Cuéllar, Dennis Meritt, Gustavo Porini, Mariella Superina

This species is now extinct in Mendoza, Argentina. According to Vizcaíno, drier conditions once existed further south into the pampas; but there are written records of its former presence dating from 1828, although no museum specimens from that time and region.

Rylands says hunting is a major issue, since *Tolypeutes* isn't fossorial. It is also a slow reproducer – only birthing 1-2 young per year, according to Meritt – and takes 3-5 years to reach maturity. Unless something is done quickly, Meritt says, especially with the habitat loss, this species will soon reach the 30% threshold. *Tolypeutes matacus* actually does better with some agriculture around, but it still needs habitat of its own.

Meritt comments that 90-95% of captured individuals will die; 80% of the ones headed for Europe die before they reach their destinations. Sechrest notes the need to evaluate the effects of hunting and agriculture.

Tolypeutes tricinctus - VU

Adriano Chiarello, Gustavo Fonseca

This species has been found in Alagoas, Sergipe, Piauí, Ceará, Pernambuco, Goiás, Rio Grande do Norte, Mato Grosso, Tocantins, the Distrito Federal and possibly Minas Gerais. Density estimates are made in Ilmar Santos' thesis, and also from early issues of *Edentata*, plus work by Jader Marinho-Filho and Marília Guimarães.

Major threats include hunting and habitat destruction, and the species is poorly represented in protected areas. Its population is suspected to have dropped more than 30% in the past 10 years, so it qualifies as Vulnerable.

Cabassous centralis - DD

Paula Lara-Ruiz, Rafael Samudio

Samudio says this species reaches up to 1800 m in Panama. Fonseca says it prefers dry to mesic forests; it also occurs in secondary forest, according to Samudio, and may also be able to tolerate an agricultural mix.

Fonseca notes this is one of the most fossorial armadillo species, and not common in museum collections – so there isn't much information available for the Red List assessment. The Data Deficient category calls attention to this lack of knowledge and helps stimulate research. Accord-

ing to Fonseca, anything weighing 5 to 6 kilos and scattered in patchy, degraded habitat needs attention.

Chiarello says they have a more selective diet than other armadillos, much more insectivorous than omnivorous. Sechrest notes that the extent of habitat loss for this species is unknown, so Data Deficient is the choice.

Cabassous chacoensis - NT

Agustín Abba, Dennis Meritt, Gustavo Porini

This species is also found in Brazil, according to Fonseca – confirmed from Mato Grosso. Cuéllar says there are no records for this one from Bolivia; as an example, she says, an average of two thousand armadillos are hunted every year from one area of *chaco* habitat in Bolivia, but not a single *C. chacoensis* was found among them. There is no idea at all of its population size. It is occasionally found in Paraguay, according to Meritt, who has seen four individuals in twenty years of fieldwork. Its habitat there is shrubland, which is almost desert for nine months out of the year – it doesn't occur in strict desert, but rather in *chaco seco*.

It suffers from habitat loss in Paraguay, and is hunted by dogs there, according to Meritt. Porini says that in Argentina it is taken for subsistence hunting. Because of the difficult conditions, it is virtually unknown: "Somebody needs to study this animal," says Meritt, "but it's impossible." Fonseca mentions one record in Córdoba, far south in Argentina, which is not recent – it's early historical, not to be used for the current range. Meritt says we don't know enough about this species, and there is hardly any published literature; there are three people here at the workshop with extensive field experience who have never seen it once themselves.

Fonseca believes that given what we know, the populations may not be hunted that much. Meritt says they occur in the Defensores del Chaco National Park – but the rangers there hunt animals for their dinner, so there's no real

protection there. Abba says there is one guard per 15,000 hectares.

Sechrest asks Fonseca if he thinks habitat loss is severe; Fonseca doesn't know, but doesn't believe the species is threatened right now. Abba says there are no direct actions to protect it, but Fonseca doesn't see enough information to put it into a threatened category, and the trend is towards Data Deficient. Abba claims it doesn't occur in degraded areas, and is hunted throughout its range; Fonseca also mentions Near Threatened as a possibility. Will the pressure continue over three generations to drop it 30%? Porini says it is losing important habitat, though he's not certain of the primary cause.

Fonseca agrees the habitat is being destroyed extremely rapidly, owing to habitat conversion; the trends are not good, and the species is susceptible to disturbance. Meritt supports *any* category that would be useful in Paraguay for the wildlife authorities; but Fonseca says no, we don't want the Red List to become a conservation strategy – we need to use the information at hand, not the hoped-for result. Sechrest says we can't go over the thresholds; is there any question that it's *not* Near Threatened? With habitat loss, present and future, do we know it won't go over the threshold? Fonseca notes that as the range becomes smaller, the species is more susceptible to changes.

Sechrest considers that it might go into a threat category with more information – he says we're confident it's definitely not Least Concern, and Fonseca agrees, so the listing is Near Threatened.

Cabassous tatouay - LC
Gustavo Porini

Rylands says it occurs in the Iguazu and San Antonio National Parks in Argentina. According to Fonseca, "this species is in almost every park we have in Brazil." Chiarello notes it is in the Serra da Canastra National Park. Its basic habitat is temperate forest. Fonseca claims it is hunted, but covered in a number of protected areas and not uncommon. Chiarello says it's difficult to see,

but can be caught on camera traps. Fonseca says it's not really found in secondary habitat, but is frequent in areas not hunted, with good habitat – but not in degraded habitat.

Fonseca says it's fairly frequent, and can tolerate secondary habitat, if not agricultural areas. It's present in a number of protected areas, so Fonseca proposes Least Concern, and everyone else agrees.

Cabassous unicinctus - LC
Gustavo Fonseca

Fonseca suggests there may be two subspecies: one centered in the Guyanas, and the other in the Cerrado, as described by Lund. He says it's quite frequent, with habitat and ecology similar to *C. tatouay*. According to Fonseca, hunting is a major threat, and habitat loss is also an issue for populations in the Cerrado. Cuéllar extends the range far into south-central Bolivia; Fonseca decides for Least Concern, and we move on.

Chaetophractus nationi - VU
Agustín Abba, Erika Cuéllar

According to Abba, the map is essentially correct. Vizcaíno asks whether it could be a subspecies of *Chaetophractus vellerosus*; he's seen the type specimen in the British Museum, which is just a piece of shell, so he's not sure if it's a real species. Fonseca says it's intermediate in size (quoting another source) while Vizcaíno says that according to Meritt, it's smaller than *vellerosus*. "They look completely different from any *vellerosus* I've ever seen," Meritt affirms. – But there are two subspecies, says Vizcaíno: has Meritt seen them both? Meritt says there aren't enough observations and specimens.

Abba says they reach an altitude of 3500 m at Abra Pampa. Cuéllar notes they are heavily hunted as the raw material for the *charango*, a traditional Andean instrument shaped like a small guitar and built around an armadillo shell.

As for threats, Fonseca simply says, “They’re in trouble.” Hunting is a major issue, as well as loss of habitat, since they are found in the puna. But according to Cuéllar, habitat loss is not the greatest threat – hunting is the real worry. The species shows up in at least one park, Sajama in Bolivia – but not in any national parks in Argentina. According to Fonseca, there is tremendous pressure on it, and it’s reasonable to assume it will fall into the 30% criterion. Most of the population is in Bolivia, and this species is listed as Endangered in the Bolivian *Libro Rojo*. Despite this, Cuéllar says, the hunting continues, and worsens, and there are no laws to stop it.

Fonseca recommends we list it as Vulnerable. Sechrest asks if the population decline has really been more than 30% in ten years or three generations; Fonseca and Cuéllar both give an emphatic “Yes.” Fonseca estimates they take 1-2 years to mature, so the generation time is probably 3-4 years.

Chaetophractus vellerosus - LC

Erika Cuéllar, Dennis Meritt, Agustín Abba

Superina notes this species is not in the south of Mendoza province in Argentina; Fonseca says it doesn’t reach into Brazil, and Cuéllar agrees. Anacleto asks Cuéllar if it might possibly occur in the Chaco of Mato Grosso. The species shows changes in its home range size – Superina says that in humid areas, the home range is about four hectares, but its range becomes much larger in dry areas. The general habitat is subtropical/seco.

The species is threatened by hunting for *charangos*, in Argentina; Cuéllar says it’s hunted in Bolivia as well. Meritt reports that in the central Chaco, it feeds on insects in newly cultivated fields, and the population has shown a visible increase in the past five years; they can be caught on the road now. Fonseca asks if they are hunted as an agricultural pest, and Superina says yes.

Abba says there is a more distant area around Buenos Aires, with a great deal of habitat destruction, and more cattle – this species is extremely

sensitive to soil disturbance, and will not tolerate even a slight alteration.

Chaetophractus villosus - LC

Adriano Chiarello, Erika Cuéllar, Dennis Meritt, Gustavo Porini, Agustín Abba

“Many habitats,” says Abba; – “Solo en Chaco,” counters Cuéllar, who insists that they only occur in *chaco*, with which Meritt agrees: they prefer dry land, and don’t occur at all in the south or east of Paraguay. “If you are crazy,” says Cuéllar, “you are going to study *villosus*.”

Vizcaíno says they are hunted for human subsistence, and also persecuted by dogs. The people in the south of Argentina hunt more for sport, but in the northwest the people eat whatever they can. Cuéllar says they occur in grasslands, semi-arid dry forest and Chaco in Bolivia, and also in Paraguay.

Sechrest says they’re widespread, common, and should be Least Concern.

Chlamyphorus (Calymnophractus) retusus - NT

Sergio Vizcaíno, Agustín Abba, Gustavo Porini, Mariella Superina, Erika Cuéllar, Dennis Meritt

Cuéllar will soon begin camera-trapping for jaguars in far southeastern Paraguay; she knows that the greater fairy armadillo is widespread, but has no idea of the population. She has come across it right in the city of Santa Cruz. Agustín Abba is not convinced that it’s so common; Cuéllar thinks it’s in Brazil. Rylands agrees that it probably occurs in the Pantanal, in sandy areas. Cuéllar adds that it occurs in the Chaco, in a huge protected area – which will get bigger, Meritt adds.

Fonseca feels that it’s likely this species is actually a separate genus, representing one of two divergent groups. He says they are convergent in terms of morphology, but that according to Wetzel they aren’t closely related. Vizcaíno uses the name *Calymnophractus*, which we will officially adopt. (No further mention of this change is made during the workshop.)

According to Cuéllar, the locals will kill it on sight, believing it's an evil sign: if they don't kill it, they believe a family member will die, and she can't convince them otherwise. She tells how she once told a driver to suddenly stop on the road one day; she dashed out of the truck to grab a fairy armadillo, while the driver sat stone-faced behind the wheel, staring straight ahead, and then slid away from her when she brought it into the cab. Meritt then comments that he saw one in the Brookfield Zoo, which had been taken out by a Peace Corps volunteer; it lived on cooked rice in a fish tank filled with soil.

As far as the assessment, "No tenemos datos," says Cuéllar: it's very rare, but there is no solid information. Rylands says it has a well-known if moderate range. Fonseca wonders if it will be threatened in the near future; it doesn't qualify as Vulnerable, but it's still fairly rare – very rare, in fact. Cuéllar emphasizes that it's persecuted wherever it's found. Fonseca allows that it has a very small range.

"...Relatively," Sechrest says: but still half a million square kilometers. He notes that we have no population information, and to list it as Near Threatened, we need some knowledge of how it's threatened. Sechrest and Rylands argue that it should be Data Deficient, since it's moderately common; Fonseca and Cuéllar disagree. Cuéllar says it's naturally rare; Meritt says you couldn't pay people money to find them quickly.

Sechrest is convinced it should be Data Deficient, and Rylands agrees; Fonseca does *not*, and believes it should be Near Threatened. He reiterates how rare it is, and that it's actively hunted; it might not be in immediate danger, but "if you forget about it," you might wake up in five years and discover a problem.

Aguiar comments on the relentless persecution of an already rare species. Rylands agrees it could be Near Threatened, saying it is "very rare and actively hunted" – this has tipped him over the edge. Meritt emphasizes that in the local culture, once it's seen it *has* to be killed.

Sechrest is unconvinced.

Vizcaíno says it has a wide distribution, but only from this continent; he doesn't want to compare it with "the feeling you are bringing from other continents." Sechrest reiterates that if we classify it as Near Threatened, we need to be confident its situation is getting worse. Chiarello thinks it could be Data Deficient. Fonseca says the range is not very extensive at all, and that it's almost an endemic to the Chaco; it suffers severe hunting pressure, and he points out that the general feeling is for Near Threatened – "that's what I hear."

Meritt adds that it's particular to one soil type: loose soils, not the clays of the Chaco, and there are very few areas in the Paraguayan Chaco with the appropriate soil. So, it is patchily distributed as well as rare and heavily hunted, and this leads it to be listed as Near Threatened.

Chlamyphorus truncatus - NT

Sergio Vizcaíno, Gustavo Porini, Mariella Superina

This species lives in sandy plains and dry grassland; according to Superina, in four years of fieldwork in Mendoza she's never seen a single one alive. She has heard of a few of them drowned, though, and domestic cats will catch them. The locals don't keep them, and claim they can't be kept, though they keep everything else. Dogs aren't a threat – only cats. One of her friends raises earthworms, and there's a pink fairy armadillo that raids his worms.

Meritt describes it as an "armadillo mole," and says they show up when a field is tilled. Superina says they occur in several parks; they live in sand dunes with scrubby grass and shrubs. They will live in and under logs, perhaps because of the associated insects. There is specific legislation in place to protect them in Argentina: National Resolution 1089.

This species is not extinct, but has a restricted range. There are no real data on the population, and no idea of the dynamics. Superina says they

are nocturnal and stay in their burrows...she feels they are Near Threatened at least. Rylands asks about the rationale for the 1089 legislation.

Meritt and Superina emphasize that the species is hardly ever seen; Superina knows rangers who have worked in one protected area for ten full years and have only seen a single individual. Sechrest wants an estimate of habitat loss across the area; the habitat in question is temperate desert and temperate shrubland. Threats include the smallholder farms. Sechrest wants an estimate of population decline – we have no hard data on populations, but how much habitat has been converted? Superina points out that the habitat has been *degraded*.

Fonseca: “Is this a Data Deficient species?”

Rylands: “I think we’re getting there.”

Sechrest asks if we could have confidence in its being Least Concern. Superina states emphatically that it is *not* Least Concern. Sechrest reviews the choices of Vulnerable, Near Threatened or Data Deficient; there are no data for Vulnerable, so it’s back to Data Deficient or Near Threatened.

Meritt mentions pesticides and fertilizers and their impact on soil organisms. Superina reiterates that habitat degradation is considerable in this area. The consensus is for Near Threatened...and after this decision, it is revealed that the prior designation had been Endangered. Fonseca doesn’t like the Near Threatened judgement; he feels the species is in too much danger, and would prefer to list it as Data Deficient. Sechrest now argues in favor of Near Threatened status. Fonseca says this is putting it in a low-risk category even though it’s rare and its habitat is not doing well. Sechrest asks about estimates of habitat loss.

Cuéllar mentions the conversion of forest to soya; Superina feels the rate of conversion to pasture is much higher. Fonseca agrees there is severe transformation, but no real statistics; he allows Near Threatened is valid, and asks if anyone is

working on this species. Superina says no: lack of funding. Fonseca says the choice is between Near Threatened or Data Deficient; Rylands calls for a vote. Fonseca gives the decision to the Argentine contingent, who unanimously decide for Near Threatened. The reason for the change is “new and better information.”

Bradypus pygmaeus - CR
Rafael Samudio

Samudio explains that the island group where the pygmy sloth is found is, in a sense, the Galápagos of Panama. Chiarello says that only on this island is the sloth statistically significant in cranial measurements from *Bradypus variegatus* elsewhere. The island is only 4.3 square kilometers all told, according to Samudio, and is mainly covered with red mangrove stands; the sloth itself is only found in mangroves, and a few small patches of other forest. Its entire range is thus 4.3 km², at most, but there are no population estimates or information on density.

Samudio says the density of *Bradypus variegatus* is about eight per hectare; Chiarello says seven to eight, and Fonseca agrees with their high values: “What’s not a leaf is a sloth at BCI.” Samudio gives a very rough estimate of 30% for total mangrove cover on the island. No one lives on the island permanently, but fishermen and local Indians will come to the island on a seasonal schedule, and hunt sloths when they do. There is no presence of authority nor enforcement of wildlife law on the island, which is part of the Comarca Indigenous Reserve. Sloths are hunted throughout this small archipelago, but the people are generally more focused towards the marine environment.

Sechrest and Fonseca don’t believe it’s Data Deficient; there is one population at a single site. Fonseca says NatureServe has it listed as G1G2, critically imperiled. Sechrest says this species is Critically Endangered, since it’s restricted to one island with minimal protection, and hunting is an issue.

Zaedyus pichiy - NT
Mariella Superina

Superina says there are many illegal hunters in Mendoza, searching for pichis with hunting dogs. There have been two serious droughts recently, 9-12 months without rain; she's had a hard time finding pichis herself, here lately. September to November is the reproductive season, when they should be out. There is a disease called "pichi pest" which appears in the rainy season, but it hasn't shown up lately owing to the lack of rain.

Superina says the hunting pressure is extreme, and also habitat change. Hunting pichis is illegal, but still widespread. The species goes into torpor in the winter. They don't seem to drink any water, and always live in arid areas. They usually have 1-2 offspring, which take over a year to reach maturity. There may have been a great many spontaneous abortions owing to the recent drought.

Major threats include roadkill, which becomes a strange sort of predation: "Anyone who hits a pichi by car," says Superina, "will stop and pick it up and eat it." Dogs and sport hunting are also an issue, and according to Superina some populations have been completely hunted out.

Sechrest points out how secure it is in the central-south portion of its range, and says there hasn't been a 30% decline in population. It's hunted significantly, he says, but the south is relatively secure. Superina says they appear to be stringently solitary. They are spread thinly through their habitat, and there is the same problem with lack of sightings in the Pampa.

Fonseca is tending towards Near Threatened; Sechrest is uncommitted. Superina reminds him that they are hunted all across their range. Fonseca agrees that Superina is in the field, witnessing a heavy decline due to hunting pressure. Superina says the habitat in Patagonia is also extremely degraded, and there can't be that many in Chile – the area around Aconcagua has all been changed

to agricultural land. "But further down here..." Sechrest says, but Superina negates that: it's too wet, and pichis are restricted to dry areas.

Fonseca: "I don't know, I could go for NT." – but Sechrest is not certain.

Abba and Superina emphasize that there is a strong human presence throughout the entire range of this species. Fonseca says there is hunting in Patagonia, and we know that intensive hunting impacts their population – so, it will most likely continue to be an issue. "Can we go with that?" he asks, and the agreement is for Near Threatened.

Dasypus hybridus - NT

Agustín Abba, Paula Lara-Ruiz, Sergio Vizcaíno

First, a discussion of *Dasypus* taxonomy in general: *Dasypus pilosus* should be *Cryptophractus pilosus*, according to Vizcaíno.

Next, Vizcaíno and Meritt note that *Dasypus hybridus* is extremely susceptible to anthropogenic land change and human activity – it is absent in many areas now. They occur mainly in grasslands; Fonseca considers it a low-risk species. Vizcaíno says they were more widespread, thirty years ago, but there has been severe hunting throughout the range. Vizcaíno and Abba believe it should be listed as Near Threatened; Fonseca wants their rationale. Rylands points out the population is in decline, but Fonseca says we need a 30% decline. Vizcaíno says the species is going fast, and is very sensitive to agriculture, much more so than others. The species is decided as Near Threatened on account of severe hunting and rapid decline.

Dasypus kappleri - LC

Teresa Anacleto

This species is found in savanna as well, but mainly in forest patches within the savanna. We have no idea about its population; it occurs mainly in the Amazon and Orinoco basins. It occurs in many protected areas.

Dasypus novemcinctus - LC

All participants

There are no serious threats to this species, although it is often hunted.

Samudio says that there is a population in the same archipelago where the pygmy sloth occurs – and that one island has smaller armadillos...

Dasypus pilosus - NE

Dennis Meritt, Gustavo Porini, Anthony Rylands

After much discussion – hampered by the lack of a Peruvian biologist – it is decided that the two southern localities are invalid, and the presumed southern population does not actually exist. Although unable to attend, Jim Loughry writes afterward that they may have an extremely restricted range, as the Río Abiseo National Park is the only place they have recently been reported from. According to Abba, they are found in the Peruvian Departments of Amazonas, Huánuco and San Martín. A final decision is still pending for this species.

Dasypus sabanicola - LC

Paula Lara-Ruiz

Rylands notes that it's savanna-based, and occurs in several large national parks, but not in the Gran Sabana. According to Lara-Ruiz, it is often found in gallery forest associated with savannas.

Dasypus septemcinctus - LC

Teresa Anacleto

This species may prefer savanna, and Teresa Anacleto believes that it's common. There is no information on the population, and no one present who knows the species.

Jim Loughry later wrote that he has captured several in the Poço das Antas National Park in Brazil, and they appear to be capable of surviving

in secondary shrubland and adapting to human disturbance.

Dasypus yepesi - DD

Sergio Vizcaíno

Sechrest asks Vizcaíno if he feels it's a valid species. Vizcaíno certainly does; but there are no data on its population. Its entire known range is within the northwestern Argentine provinces of Salta and Jujuy.

Euphractus sexcinctus - LC

Erika Cuéllar

Rylands comments that this species is heavily hunted in the Cerrado, even though it tastes awful. It's widespread and resistant to human disturbance, he says, and should be considered Least Concern.

Priodontes maximus - VU

Erika Cuéllar, Dennis Meritt, Gustavo Porini

Superina doubts the giant armadillo ever occurred in Uruguay. Rylands suggests it might be in the Atlantic Forest, but he's not certain about now – although he's positive that it did at one point.

Meritt says that in the Chaco, temperatures can fall below zero: and *Priodontes* just goes under the soil, and stays there until conditions are warmer. It has a patchy distribution, widespread but with rarefied populations wherever it occurs – “One of those living fossils.” Although they're all across the Amazon, there are two places where they're most likely to be found: the zone of northern Argentina and the Chaco, and the *llanos* of Guyana.

According to Paula Lara-Ruiz, they're declining all over their range. Superina says a major problem is that animals are caught for the black market, but they die before they ever actually reach the black market. Meritt says that in some parts of its range, the giant armadillo represents the single largest source of protein for indigenous people.

This is especially true in Paraguay, Argentina and Brazil: “When it’s encountered, it’s eaten!”

Sechrest calls this a “very difficult species,” since obviously it’s wide-ranging and present in many intact areas. He asks about the level of hunting and what impact it has, whether there are any studies on these issues. Vizcaíno says there has been a major decline in the past ten years. Superina says they have yet to reproduce in captivity. Meritt replies this is because no one’s had a pair together long enough, at least not until recently – no one has any idea what the generation time is.

Vizcaíno asserts there has been an important reduction of the overall distribution in the past three generations. No one is sure what the generation time is.

Porini comments that you never find small ones. Vizcaíno is having a hard time working out the generation time; Meritt says it’s six to ten years all told – “only an educated guess.” They have huge bodies, he says, with no room for many offspring. No one has ever seen their young.

Sechrest wants to know about the population parameters. What is the rate of population decline in the past twenty or thirty years? Paula Lara-Ruiz says it has declined 50% in the past thirty years.

After much discussion, Sechrest asks about its status in the Amazon. Rylands isn’t sure: but wherever it’s found, it’s killed, and there are few places in its range without people. Rylands speculates there might be only three to five thousand individuals in the entire Amazon.

The population may have been reduced by 30% over the past 20-30 years. Rylands points out that the original population has *already* suffered a tremendous crash; now it’s stable, but dying. The species is heavily hunted and rare; Rylands says it should be considered Vulnerable, or more. Meritt notes there are not many specimens in museums, despite its immense distribution. The consensus of the group, then, is for Vulnerable.

John M. Aguiar, Center for Applied Biodiversity Science, Conservation International, 1919 M Street NW, Suite 600, Washington, DC 20036, USA. E-mail: <j.aguiar@conservation.org>.



Illustration by Stephen D. Nash.



FIGURE 1. *Bradypus torquatus*.



FIGURE 2. *Bradypus tridactylus*.



FIGURE 3. *Bradypus variegatus*.

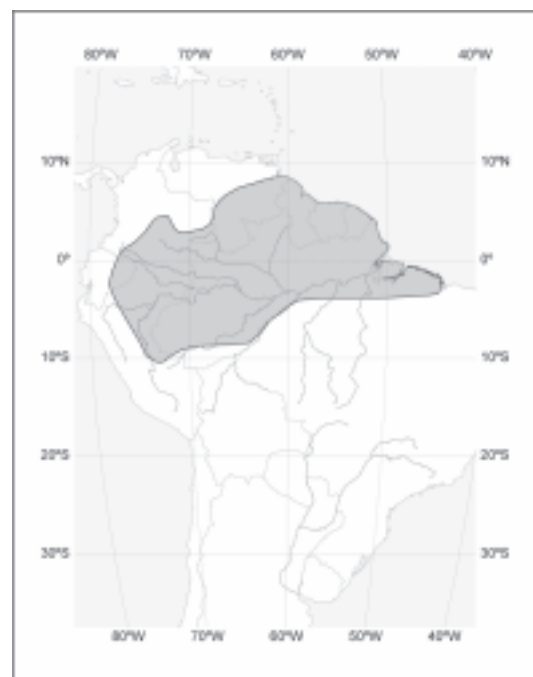


FIGURE 4. *Choloepus didactylus*.

Maps: IUCN Global Mammal Assessment and the Edentate SG.

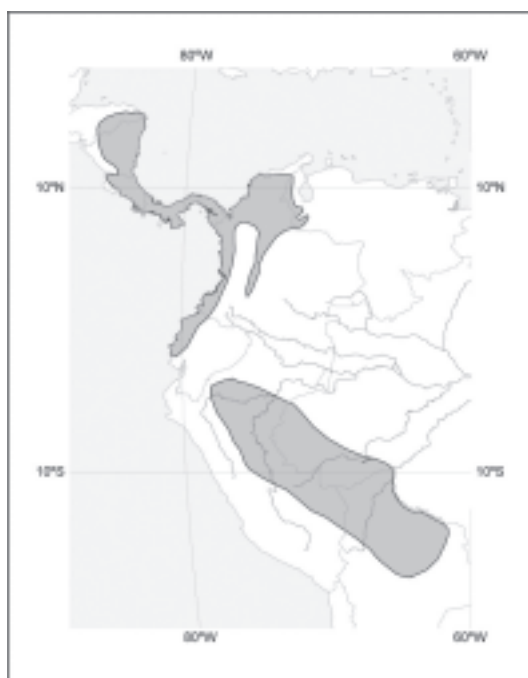


FIGURE 5. *Choloepus hoffmanni*.



FIGURE 6. *Cyclopes didactylus*. Central America detail.



FIGURE 7. *Cyclopes didactylus*. South America detail.



FIGURE 8. *Myrmecophaga tridactyla*. Central America detail.

Maps: IUCN Global Mammal Assessment and the Edentate SG.



FIGURE 9. *Myrmecophaga tridactyla*. South America detail.



FIGURE 10. *Tamandua mexicana*.



FIGURE 11. *Tamandua tetradactyla*.

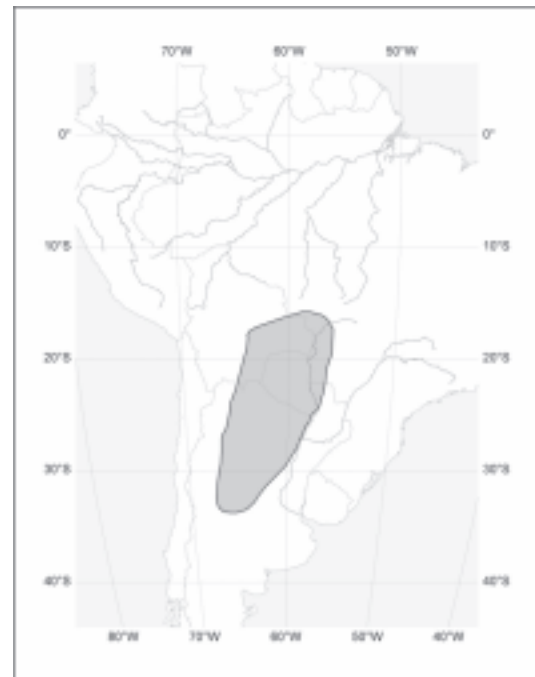


FIGURE 12. *Tolypeutes matacus*.

Maps: IUCN Global Mammal Assessment and the Edentate SG.

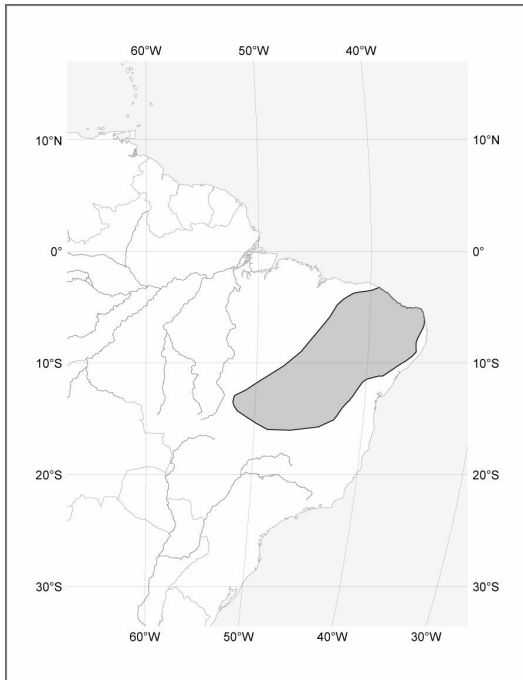


FIGURE 13. *Toxotes jaculator*.



FIGURE 14. *Cabassous centralis*.

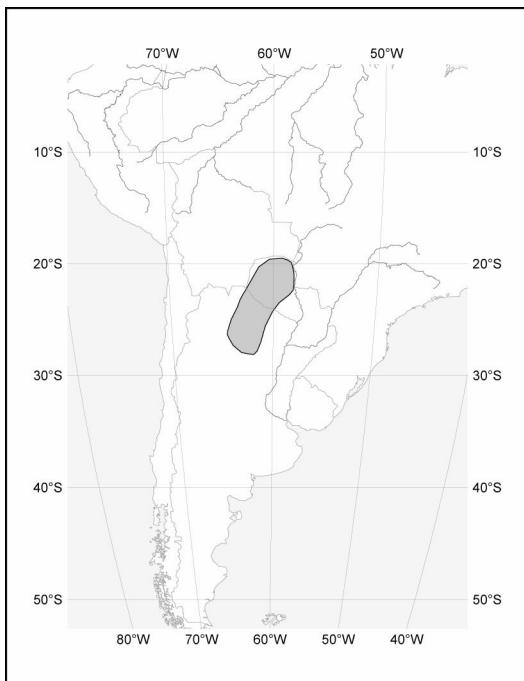


FIGURE 15. *Cabassous chacoensis*.

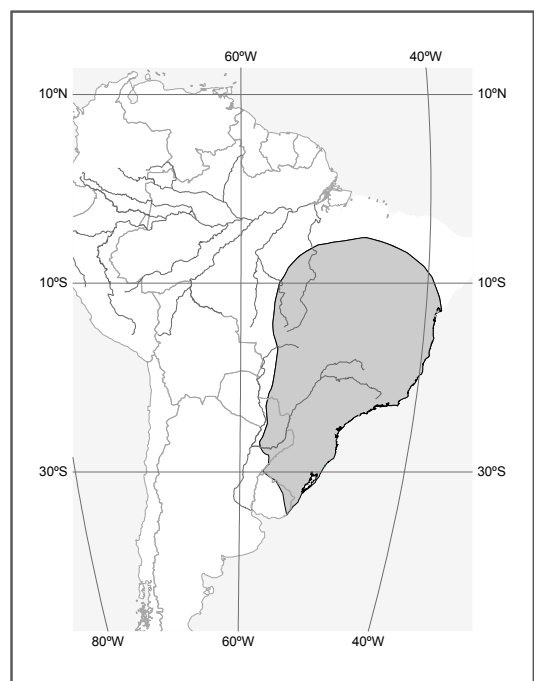


FIGURE 16. *Cabassous tatouay*.

Maps: IUCN Global Mammal Assessment and the Edentate SG.



FIGURE 17. *Cabassous unicinctus*.

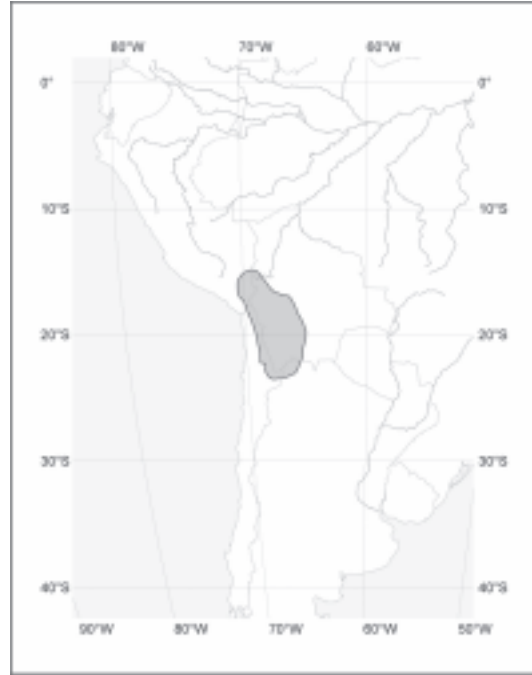


FIGURE 18. *Chaetophractus nationi*.



FIGURE 19. *Chaetophractus vellerosus*.



FIGURE 20. *Chaetophractus villosus*.

Maps: IUCN Global Mammal Assessment and the Edentate SG.



FIGURE 21. *Chlamyphorus retusus*.

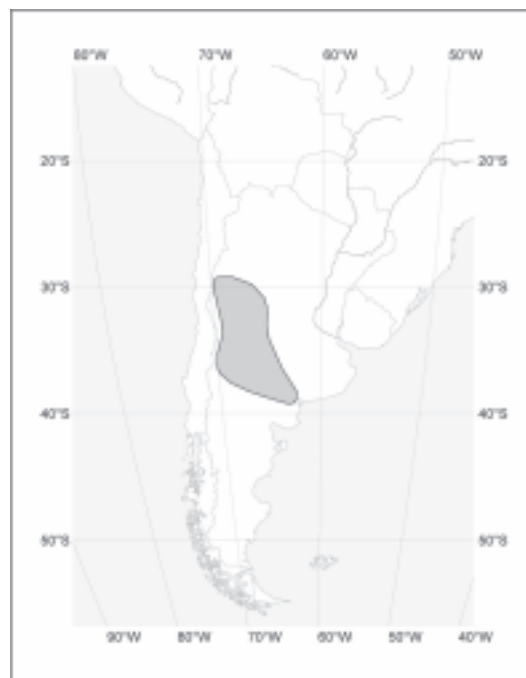


FIGURE 22. *Chlamyphorus truncatus*.



FIGURE 23. *Zaedyus pichiy*.



FIGURE 24. *Dasypus hybridus*.



FIGURE 25. *Dasyus kappleri*.



FIGURE 26. *Dasyus novemcinctus*. South America detail.



FIGURE 27. *Dasyus novemcinctus*. North and Central America detail.



FIGURE 28. *Dasyus pilosus*.

Maps: IUCN Global Mammal Assessment and the Edentate SG.

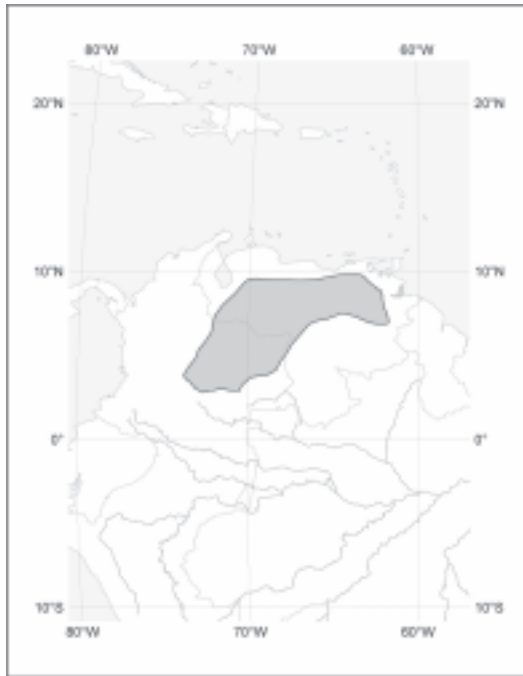


FIGURE 29. *Dasypus sabanicola*.



FIGURE 30. *Dasypus septemcinctus*.



FIGURE 31. *Euphractus sexcinctus*.



FIGURE 32. *Priodontes maximus*.

Note: No range map was available for *Dasypus yepesi*.

Maps: IUCN Global Mammal Assessment and the Edentate SG.