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Urban bushmeat trade in different ecoregions in Colombia

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Abstract

The bushmeat trade in ecosystems (e.g. tropical dry forests, mountain forests, savanna) other than those within the Amazon basin is presumed insignificant in South America. Wild meat is considered irrelevant in non-moist forests because alternative protein sources (e.g. beef, chicken, fish) are considered more readily available. Some studies and confiscation reports in countries such as Colombia, suggest that bushmeat is consumed in a variety of ecosystems. However, knowledge of the nature of market chains operating (often through clandestine channels) particularly in urban areas, is still unknown. Here, we studied the urban bushmeat trade in markets in the five main eco-regions in Colombia. We recorded a total of 85 species traded; the most frequent species on sale being the paca (*Agouti paca*), red brocket deer (*Mazama americana*), grey brocket deer (*Mazama gouazoubira*), capybara (*Hydrochoerus hydrochaeris*), armadillo (*Dasypus* spp.) and black agouti (*Dasyprocta fuliginosa*). Most sale of wild meat occurs through hidden channels. Bushmeat is a luxury product in urban areas from the Caribbean, the Pacific and the Andean regions. There are a limited number of stakeholders operating in a reduced geographical area. Further work is needed to quantify and monitor volumes, comprehend motivations, explore ways of reducing threats, and engage with stakeholders to organize legal and sustainable bushmeat use.

Introduction

Use of wildlife in South America for food or gifts is deeply embedded in traditional rural lifestyles. An estimated 5 to 8 million people throughout the continent are thought to regularly consume bushmeat; a source of protein, fat and micronutrients (Sirén & Machoa, 2008; Golden et al., 2011). Most people that rely on bushmeat include some of the poorest in the region (Rushton et al., 2005). In some cases, bushmeat is also eaten because people prefer it over domestic meat, or as a festival food (Wilkie & Godoy, 2001; Siren, 2012). Bushmeat trade is an important part of local economies, contributing to local livelihoods, food security and diet diversity (van Vliet et al., 2014; Parry et al., 2014; Siren, 2012). Bushmeat trade is illegal in most South American countries, but can be conducted legally if local authorities issue approved licenses (van Vliet et al, in press). Often, because administrative procedures to obtain a permit are unclear or extremely complex, bushmeat trade is illegal. Existing data on bushmeat sold in towns in some South American countries are largely derived from confiscations by environmental agencies (OTCA, 2009), and therefore may underestimate the situation. Some information exists on the extent of urban bushmeat markets in Iquitos in Peru (Rushton et al. 2005), Pompeya in Ecuador (WCS 2007) and Abaetetuba in Brazil (Baía et al., 2010). More recently, Parry et al. (2014) examined the scale and drivers of urban wildlife consumption in the forested pre-frontier of Brazilian Amazonia and found that bushmeat was eaten at least once a month by nearly half of urban households surveyed. In a recent paper describing the species and volume of bushmeat sold in the tri-frontier (Brazil-Peru-Colombia) Amazonian towns of Leticia, Tabatinga and Caballococha, (van Vliet et al., 2014), showed that 473 tons of bushmeat were potentially traded per year. Given the known urban population size of this region, around 3.2 kg/capita/year were likely to be

consumed; an amount comparable to that estimated for Central African urban areas where bushmeat consumption is commonplace (Nasi et al., 2011).

Available literature on bushmeat trade in South America has mostly focused on the Amazon region. This is probably because bushmeat trade in other ecosystems such as tropical dry forests, mountain forests or savannas, is thought to be insignificant and assumed to largely absent due to the greater availability of other alternative sources of protein e.g. beef, chicken, fish (Rushton et al., 2005). Regular bushmeat consumers have been estimated to include only around 1.5 - 2.0% of the total population in South America (Rushton et al., 2005). Bushmeat consumption is considered to be absent in urban areas.

A number of studies have highlighted the importance of wildlife in different regions in Colombia (see Vargas-Tovar 2012, for a review). Despite the existence of sanctions (including imprisonment), commercial hunting is a regular occurrence within rural communities in the country. For example, an estimated 43% of animals taken by hunters in Puerto Nariño (Amazon region in the border with Peru) was sold to consumers (Quiceno et al., 2014). Species traded were mostly mammals (60% of reports), followed by birds (26%) and reptiles (14%). Hunting was essentially for subsistence reasons, as a direct source of food or as a means of generating income to purchase commercially available foodstuffs and beverages, processed products, or hunting supplies. In Inírida (Colombian Amazonas bordering Venezuela) Ortega (2014) also indicated that 31-53% of hunter offtake was sold. In the Andes region, however, Casas (2007) suggests that commercial hunting in Boyacá was relatively

insignificant, but sometimes rodents and birds are sold to meet short-falls in agricultural production.

Countrywide data on bushmeat trade in Colombia is available from official sources. Confiscations by the Department of Security indicate that as much as 31,147 kg of bushmeat were confiscated between 1998-2004 (Mancera & Reyes, 2008). Similarly, data from the Direction of Taxes and Customs show that around 12,621 kg of capybara meat (*Hydrochoerus hydrochaeris*) were seized during 2004 - 2006 (Mancera & Reyes, 2008). These amounts are presumed to be significant underestimates of the amounts traded, since seizures are likely to represent 1-10% of the volume of wild meat commercialized (Mancera & Reyes, 2008). Thus, throughout the country, there is a need to better understand which species are commercialized for meat, what bushmeat trade chains exist, trade routes and stakeholders involved to determine ways of making bushmeat trade sustainable without threatening the country's biodiversity.

In this study, we investigated wild meat markets in a number of contrasting environments in Colombia; 24 urban municipalities within the 5 main ecoregions found in the country. We aimed to document wild species sold for meat in different parts of the country by visiting known trade establishments (markets, stalls and stores, butchers, restaurants) within the targeted urban areas. Although our approach was intended as a rapid assessment, it allows us to determine the extent of bushmeat trade in such an ecological varied country as Colombia.

Study area

Colombia is listed as one of the world's "megadiverse" countries, hosting close to 10% of the planet's biodiversity (Carrizosa-Umaña, 2014). The primary terrestrial biomes in Colombia have undergone several changes: 53% of the mainland is still covered with natural forests, which account for more than half of the terrestrial animals and plants, and more than two-thirds of terrestrial net primary production (IDEAM et al., 2007). One of the most threatened forest ecosystems is the dry forest, whose range is around 2% of its original extension. The Amazon and Andean regions have the highest number of plant species, followed by the Pacific, the Caribbean region and the Orinoquía (Carrizosa-Umaña, 2014). Colombia's biodiversity is not only important for the country's natural heritage and the preservation of unique species in the world, it is also essential for guaranteeing basic conditions for the improvement of human welfare, social equality and economic development. Moreover, biodiversity and its functions and processes provide direct-use goods and services, such as food, medicines, fuel, wood and water as well as indirect-use services, such as climate regulation, prevention of disasters, soil formation, water purification and recreation.

For our study, we sampled small and medium sized towns (5 000 - 150 000 inhabitants) in 5 eco-regions of Colombia (Table 1): Caribbean, Andean, Pacific, Orinoquía and Amazon regions (Fig. 1). The size of the localities was chosen to target urban areas that still have a clear connection with rural processes and products, but also sampled a market in the capital city of Bogota for comparison.

Our study covered 2 of the three main biomes (tropical dry forest and tropical moist forest) and 6 territorial environmental systems (among the 19 described in Colombia by Carrizosa-Umaña, 2014).

Because Colombia has been shaped by a history of conflict for more than 50 years, some regions pose high risks for research, particularly in areas of illicit drug traffic and illegal mining (PNUD, 2011). As such, in Colombia, security is an important criteria that determines where field research can take place in good conditions. Given the fact that we were studying an illegal activity, we were particularly careful to avoid unnecessary risks for our research team.

Methods

The study was carried out in September 2013 in Leticia but from November 2014 to January 2015 in the other sites. We deployed three research teams of 2 persons each, who were previously trained to apply the same methodology in every site. Each research team spent 15 - 20 days in each site. They used participant observation, regularly visited sale points and source areas, as well as conducted informal discussions with stakeholders. After the first visit and at an appropriate moment to avoid mistrust, the objectives of the study were then explained to stakeholders. Some stakeholders (3% of those approached) did not want to share information, but most were interested in the motives of our research, and contributed with interest to the study. Researchers spent a considerable amount of time discussing the use of wild meat with the different stakeholders, sometimes sharing a meal and conversing about their favourite meals. Conversations followed an unstructured format, but were guided by questions such as: is any bushmeat sold here? Do people here like it?

Where does it come from? Who brings it here? How much control is there around here? What is the price of bushmeat? What are the species that are most often sold here? Who buys it? With the help of the stakeholders, we mapped actual trade routes so as to provide us with an idea of the catchment area offering meat to the town. For each of the visited sites, researchers asked about the list of species sold. We used a snowball strategy to ask our first contacted persons to provide us with names of other people in town selling bushmeat. We did this until no other new person was referred to us. We visited a total of 528 sale points that could potentially sell bushmeat, including markets, restaurants, butcher shops, fish markets, food stalls, and grocery stores (Table 2).

Results

Sale points and stakeholders

Sale of bushmeat was found in all visited municipalities. All sales detected were clandestine, hidden away from the general public. Trade occurred within a trusted network of customers and sellers. A total of 144 of the visited 528 sale points traded wild meat (Table 2); 10 markets, 48 restaurants, 3 butchers, 44 non-food stalls, 22 food stalls, 6 grocery stores, and 6 sale points scattered within peri-urban areas.

Intermediaries involved in the bushmeat trade were women, who would sell wild meat to complement a main commercial activity (such as selling fish, domestic meats, or groceries). Hunters either sold their quarry directly to known consumers, or would take their meat to the local market, disembark it onto riverine harbours from where it would be taken to market stalls or to restaurants to be sold to the final consumers.

Often bushmeat would be kept in hidden fridges.

For the 5 ecoregions, a total of 193 hunters were known to participate in the market chain. Hunters providing meat to urban towns were usually farmers of diverse origins (*colonos*, Afro-descendants or indigenous) who hunted as part of a diversified economy in their own private lands or common grounds. However, in the Pacific region and in the Amazon region we identified and interviewed peri-urban hunters who worked in rural (e.g. farming or timber extraction) and urban situations (e.g. transporters, carpenters), but relied on the bushmeat trade to complement their income. The sale of bushmeat for these people was a highly lucrative activity, some able to invest the equivalent of 1,200 USD in well-trained hunting dogs. Most hunters were men, although women and children also hunted small animals such as rodents and birds, but only for their own consumption. The market chain works based on trust between hunters, intermediaries and consumers, who are in touch by phone or by regular visits (Fig. 2). Market chains have adapted to the level of law enforcement in each region, though trade hours are usually in the early hours before dawn.

Traded species

A total of 85 species was traded in the 5 studied regions (Supplementary Material 1). Frequency of sale points mentioning each species is shown in Fig. 3. In the Amazon region, 20 species were traded, among which the most abundant taxa were the paca (*Cuniculus paca*), grey brocket deer (*Mazama gouazoubira*), red brocket deer (*Mazama americana*), lowland tapir (*Tapirus terrestris*) and the white-lipped peccary (*Tayassu pecari*). In the Andean region, 19 species were traded, with capybara, armadillo, pacarana (*Dinomys branickii*), rabbit (*Sylvilagus brasiliensis*) and the black agouti (*Dasyprocta fuliginosa*) being the most common species traded. In Bogotá, capybara (*Hydrochoerus hydrochaeris*), paca, armadillo (*Dasypus* spp.), wild duck

and pigeon were the most frequently mentioned. In the Orinoquía region, the most commonly sold species was dried or fresh capybara, which is highly preferred in the region. Other species include armadillo, paca and the white tailed deer (*Odocoileus virginianus*). In the Caribbean region, a total of about 14 species were reported on sale, mainly paca, deer (red and grey brocket), black agouti and armadillo. In the Pacific region, 28 species were traded. The most common was paca, followed by black agouti, armadillo, deer (red brocket and grey brocket), caiman and river turtles.

Trade routes

In all regions except for Bogota, we observed short trade routes from surrounding rural areas to the closest main town. The distance from a main town to its most remote source area was rarely more than 150 km (in the Caribbean approximately 80 km away, in the Amazon usually less than 90 km, in the Orinoquía and Pacific region 100 - 150 km). No established longer routes towards the capital or to other countries were observed, except for trans-boundary trade in the case of Leticia. Bogota is a special case, since bushmeat enter the city from remote places (from the Caribbean, Andean, Orinoquía or the Amazon regions) but in very small quantities and on a sporadic basis. Bushmeat is transported to the main urban centres via rivers, peri-urban and urban roads using a variety of transport means including boats, motorcycles, bicycles, cars, public buses, mules and trucks.

Prices

Bushmeat was the most expensive source of meat in towns from the Caribbean, Pacific and Andean regions. In the Amazon, bushmeat was cheaper than beef, but more expensive than most fish, chicken and canned meats. In the Orinoquía region,

bushmeat was more expensive than fish, but more expensive than beef (Table 3). According to the stakeholders' perception, prices depend on availability of the resource, intensity of law enforcement and customer purchasing power. In rural and peri-urban areas around the study sites, bushmeat was considered a cheap option since hunting was practiced for own consumption and occasional sale. However, in urban areas, bushmeat is considered a luxury item for which customers are willing to pay a premium price because of its special taste or because it is a natural alternative to beef, pork and chicken. For example, in the Amazon, beef costs 5.0 USD/kg, industrial chicken 2.5 USD/kg, and fresh bushmeat 4.0 USD/kg on average. In contrast, in the Andean and Pacific regions, beef costs on average 4.7 USD/kg and fresh paca meat can retail as much as 11.8 USD/kg.

Discussion

Our study provides evidence of the presence of bushmeat trade in towns in a variety of eco-regions in Colombia. It shows that despite regulations and law enforcement efforts, bushmeat continues to be traded outside the law within well-established clandestine routes. This finding contrasts with the suggestion by Rushton et al., (2005) that bushmeat consumption in urban areas in Latin America is likely to have disappeared given the availability of other cheaper sources of protein. Unlike bushmeat markets in Central Africa (Fa et al., 2006; Starkey, 2004; Dupain et al., 2012; Nasi et al., 2011; van Vliet et al., 2014) or in some markets in the Brazilian Amazon (Baia et al., 2010; Parry et al., 2014; van Vliet et al., 2015) where bushmeat is sold openly in markets, the trade in Colombia occurs clandestinely. The actors involved in the trade and the structure of the trade chain in this country have similar characteristics to those observed in most Central and West African markets

(Cowlshaw et al., 2005). Here, the main actors of the trade chain are farmer hunters, commercial hunters, wholesalers, market traders and food stall operators. However, there are some differences with what is commonly observed in Central and West African markets: 1. In Colombia, both men and women are involved in the trade whereas in West and Central Africa, mainly women take care of the trade; 2. In Colombia, all traders have another primary occupation (they sell other food products, groceries, clothes, or have another source of income) and sell bushmeat as a way to complement their income. In Central and West African markets, it is common to see market or food stall traders specialized in bushmeat trade. 3. Most bushmeat is sold fresh or frozen, whereas in West and Central African markets (except for Gabon) and in Brazil (van Vliet et al., 2015) bushmeat is most often sold smoked (Cowlshaw et al., 2005; van Vliet et al., 2014). 4. The number of stakeholders involved in the trade is limited compared with Central Africa, and the trade occurs within a network of known consumers and a limited number of providers. For example, in Leticia only 2 traders sell wild meat in the local market (van Vliet et al., 2015), in comparison to a town like Koulamoutou (Gabon) of a similar population size, which may have around 13 traders operating in the market (Starkey, 2004). 5. In Bogota, the capital city, it is possible to find bushmeat, but there is no organized regular market chain supplying the capital, as observed in many cities from Central Africa. The trade remains concentrated in medium-sized towns close to source areas.

In our study site, hunters come from rural or peri-urban areas and sell bushmeat as part of a diversified economy. Farmer hunters hunt for subsistence in private or community land where they also practice agriculture and sell their surplus to known consumers or to wholesalers. Peri-urban hunters hunt mainly for commercial purposes but hunting is not their primary occupation. They often combine

hunting and other rural jobs (e.g. timber extraction) with small urban businesses or salaried jobs, as observed in Brazil (van Vliet et al., 2015). In urban areas from the Caribbean, the Pacific and the Andean regions, bushmeat is the most expensive type of meat and the trade is very lucrative. This allows peri-urban hunters to invest in hunting for commercial purposes. As observed in some parts of Africa by Brashares et al. (2011), bushmeat in urban areas satisfies a luxury market for wealthy families, but the opposite is true in more isolated settlements where bushmeat continues to be among the cheapest available source of protein, provided there is a hunter in the family. As observed in urban areas in Africa (Wilkie et al., 2005; Fa et al., 2006; Kümpel et al., 2007, van Vliet and Mbazza, 2011; Bachand et al., 2015, but also see some exceptions, e.g. van Vliet et al., 2014), some households consume bushmeat despite it being among the most expensive meats. In areas where bushmeat is rarer (e.g. the Andean region), bushmeat can cost three times more than beef. As urban markets grow and rural areas are increasingly connected to them, it is possible that less bushmeat is kept for own consumption and more is sold to the urban luxury market, with implications for rural food security, as observed in Madagascar (Golden et al., 2011). In Brazil, Parry et al., (2015) also evidenced the long-term transition from consumption of wildlife as an economical source of protein for the poor to luxury food for the wealthy.

The most traded species in urban markets are paca, red brocket and grey brocket deer, capybara, armadillo and black agouti. In addition, lowland tapir and peccary are common in the Amazon, whereas capybara is commoner in the Orinoquía and Andean regions. Armadillo was found in all regions except the Amazon, but rabbit exclusively in the Andes and caiman in the Pacific region. The majority of species traded are listed as Least Concern according to the IUCN Red List from

Colombia. Paca, black agouti, red brocket and grey brocket deer, capybara and caiman are not listed as threatened by the Instituto Alexander von Humboldt in Colombia (IAvH, 2015). However, the white-lipped peccary is considered vulnerable, the giant armadillo endangered, tapirs and white tailed deer as Critically Endangered.

Most observed markets in our study are therefore far from the post-depletion sustainability situation such as observed in the Takoradi market in Ghana (Cowlshaw et al., 2005) where only the more resilient species persist. For all our study sites, the trade of threatened species therefore deserves closer attention. On the other hand, trade of the most resilient species, could be legalized so as to test the feasibility of certification targeting wealthy urban consumers.

Interestingly, most trade routes are relatively short (max 150 km) and do not imply inter-regional or international trade (except for trans-boundary trade in the Amazon across rivers that play a border role). This is important for two major reasons: 1. The possibility that the trade in bushmeat and the handling of fresh meat could contribute to the emergence of zoonotic pandemics, as observed in Africa, is very limited. 2. The bushmeat trade involves a limited number of stakeholders operating in a reduced geographical area, and this makes it possible to develop programs that target all levels of the trade (consumers, traders and hunters) with strategies that can be adapted to each of the beneficiaries, combining sensitization, legal sustainable trade, enforcement strategies and monitoring.

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Biographical sketches

NATHALIE VAN VLIET'S research focuses on studying the links between wildlife and livelihoods having worked extensively on bushmeat and its contribution to food security and local economies in Central Africa and South America. MARIA PAULA QUICENO MESA'S background is the management of biodiversity and conservation of natural resources by indigenous communities, farmers and settlers, as well as with research institutions and decision makers at national and international levels. DANIEL CRUZ-ANTIA is an ecologist working on the use of biodiversity, wildlife management, socio-environmental conflicts and cultural change in rural communities. JESSICA MORENO is an environmental biologist specialising on participatory monitoring of use and trade of wildlife in the Amazonian trifrontier region and the Casanare department. JOHN E. FA specializes in conservation science, focusing on human use of wildlife, threatened species and ex-situ conservation. ROBERT NASI'S research interests include the sustainable use of forest products and the multiple-use management of tropical forests.

Table 1. Main biomes, territorial environmental systems, river basins and sites sampled in our study.

Region	Study area	Main biomes (IDEAM et al. 2007)	Territorial environmental systems (Carrizosa-Umaña 2014)	River basins (Salazar-Holguín et al. 2013)	Population (inhabitants)	Area (km ²)
Amazonian	Inírida	Tropical moist forest	The Amazon and Orinoco forest	Orinoco basin	15,676	17,000
	Leticia			Amazon basin	37,832	109.6
	Puerto Nariño				6,983	1,800
Andean	Bogotá	Tropical dry forest, Tropical moist forest	The Central System		6,763.33	1,775
	Salento				7,001	378
	Circasia		The Coffee West	Magdalena-Cauca basin	26,705	91
	Calarcá				75,628	219
	Montenegro				38,714	149
Orinoquia	Yopal	Tropical moist forest	The piedmont plains and the Orinoco flood	Orinoco basin	103,754	2,771
	Villanueva				20,730	825
	Monterrey				11,421	879
	Tauramena				15,699	2,607
	Aguazul				33,172	148
	Pore				7,490	780
	Paz de Ariporo				26,915	13,800
	Hato Corozal				9,618	5,518
Caribbean	Aracataca	Tropical dry forest, Tropical moist forest	The Sierra Nevada de Santa Marta and its watershed	Magdalena-Cauca basin	34,929	1,755
	Santa Marta			Magdalena-Cauca basin	414,387	2,393
	Zona Bananera			Magdalena-Cauca basin	56,404	479
	Fundación			Magdalena-Cauca basin	56,107	931
	Ciénaga			Caribbean basin, Magdalena-Cauca basin	100,908	1,212
	El Copey			Magdalena-Cauca basin	24,368	968
Pacific	Quibdó	Tropical moist forest	The Pacific Coast	Caribbean basin	109,121	3,337

	Algarrobo	0	0	3	0	0	0	0	0	0	0	0	0	0	0
	El Copey	1	1	8	2	0	0	0	0	0	0	0	0	0	0
Pacific	Quibdó	3	1	22	7	19	0	40	40	2	2	0	0	11	8
	TOTAL	34	10	295	48	64	3	46	44	69	22	11	6	14	11

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Table 3. Prices of bushmeat in comparison to prices of other animal protein sources.

Type ¹	Region/Price (USD)				
	Amazonian	Andean	Orinoquia	Caribbean	Pacific
Fresh bushmeat	4.80	8.68	4.93	7.13	10.40
Fresh beef	5.33	5.53	3.91	3.75	4.74
Fresh chicken	1.78	2.79	3.48	1.78	2.61
Fresh goat meat	-	-	-	3.95	-
Fresh fish	3.16	3.48	6.08	1.58	5.07
Canned sardines	1.38	-	-	-	-
Canned tuna	1.38	-	-	-	-

1: All prices of meats are per kg.

Annex 1 List of species reported in the market chain of bushmeat in the regions visited.

GROUP	Common Name	Scientific Name	Amazonian	Andean	Orinoquía	Caribbean	Pacific
Mammals	Colombian Red Howler Monkey	<i>Alouatta seniculus</i>	X				
	Armadillo	<i>Cabassous centralis</i>				X	X
	Armadillo	<i>Cabassous unicinctus</i>		X	X		
	Golden-backed Black Uakari	<i>Cacajao melanocephalus</i>	X				
	Paca	<i>Cuniculus paca</i>	X	X	X	X	X
	Black Agouti	<i>Dasyprocta fuliginosa</i>	X				
	Central American Agouti	<i>Dasyprocta punctata</i>		X		X	X
	Armadillo	<i>Dasypus novemcinctus</i>		X		X	X
	Armadillo	<i>Dasypus sp.</i>	X	X	X		
	Pacarana	<i>Dinomys branickii</i>		X			
	Capybara	<i>Hydrochoerus hydrochaeris</i>	X	X	X		
	Lesser Capybara	<i>Hydrochoerus isthmius</i>				X	X
	Rabbit	<i>Sylvilagus brasiliensis</i>		X			
	Red Brocket	<i>Mazama americana</i>	X			X	X
	Gray Brocket	<i>Mazama gouazoubira</i>	X				
	Deer	<i>Mazama spp.</i>			X		
	Mice	MURIDAE					X
	White-tailed Deer	<i>Odocoileus virginianus</i>	X		X	X	X
	Tiger	<i>Panthera onca</i>					X
	Collared Peccary	<i>Pecari tajacu</i>	X			X	X
	Giant Armadillo	<i>Priodontes maximus</i>	X	X	X		
	Tree squirrels	<i>Sciurus sp., Microsciurus sp.</i>		X		X	
	Ant-eater	<i>Tamandua mexicana, Myrmecophaga tridactyla</i>					X
Lowland Tapir	<i>Tapirus terrestris</i>	X					
White-lipped Peccary	<i>Tayassu pecari</i>	X				X	
Birds	Goose	ANATIDAE		X			
	Tufted duck	ANATIDAE		X			
	Duck	ANATIDAE		X			

	Dunn's Mud Turtle	<i>Kinosternon dunni</i>				X
	Turtles	<i>Lepidochelys olivacea, Chelonia agassizii, Dermochelys coriacea, Rhinoclemmys spp., Eretmochelys imbricata</i>				X
	Dwarf or Smooth-fronted caiman	<i>Paleosuchus sp.</i>	X			
	South American River Turtle	<i>Podocnemis expansa</i>	X			
	“Hicotea” turtles	<i>Rhinoclemmys melanosterna</i>		X		X
	Large-nosed wood turtle	<i>Rhinoclemmys nasuta</i>				X
	Hicotea turtle	<i>Trachemys callirostris</i>		X		
	Small turtles	<i>Trachemys scripta</i> , TESTUDINIDAE, EMYDIDAE	X			X
Crustaceans	Crustaceans	Crustáceo			X	

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FIGURE LEGENDS

Fig. 1. Distribution of sampling sites according to the five ecoregions selected for study in Colombia.

Fig. 2. The basic structure of the bushmeat commodity chain in Colombia.

Fig. 3. Distribution of bushmeat species in the studied ecoregions in Colombia. Proportion of species is derived from the number of times bushmeat sellers mentioned a particular species traded.

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Fig. 1.

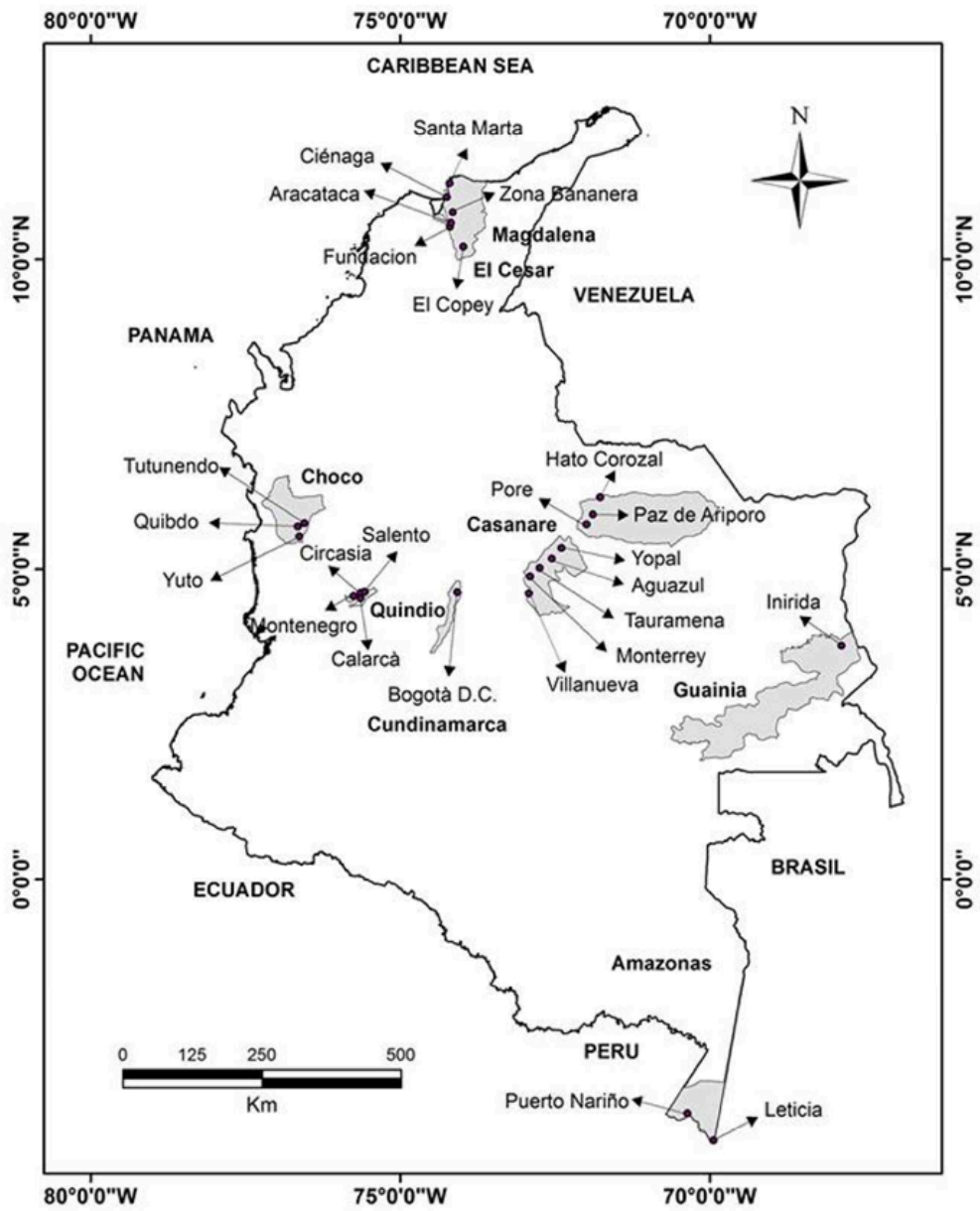


Fig. 3.

