

## **Incidental records of mammals from Leguízamo, Putumayo, Amazon region at the southern border of Colombia**

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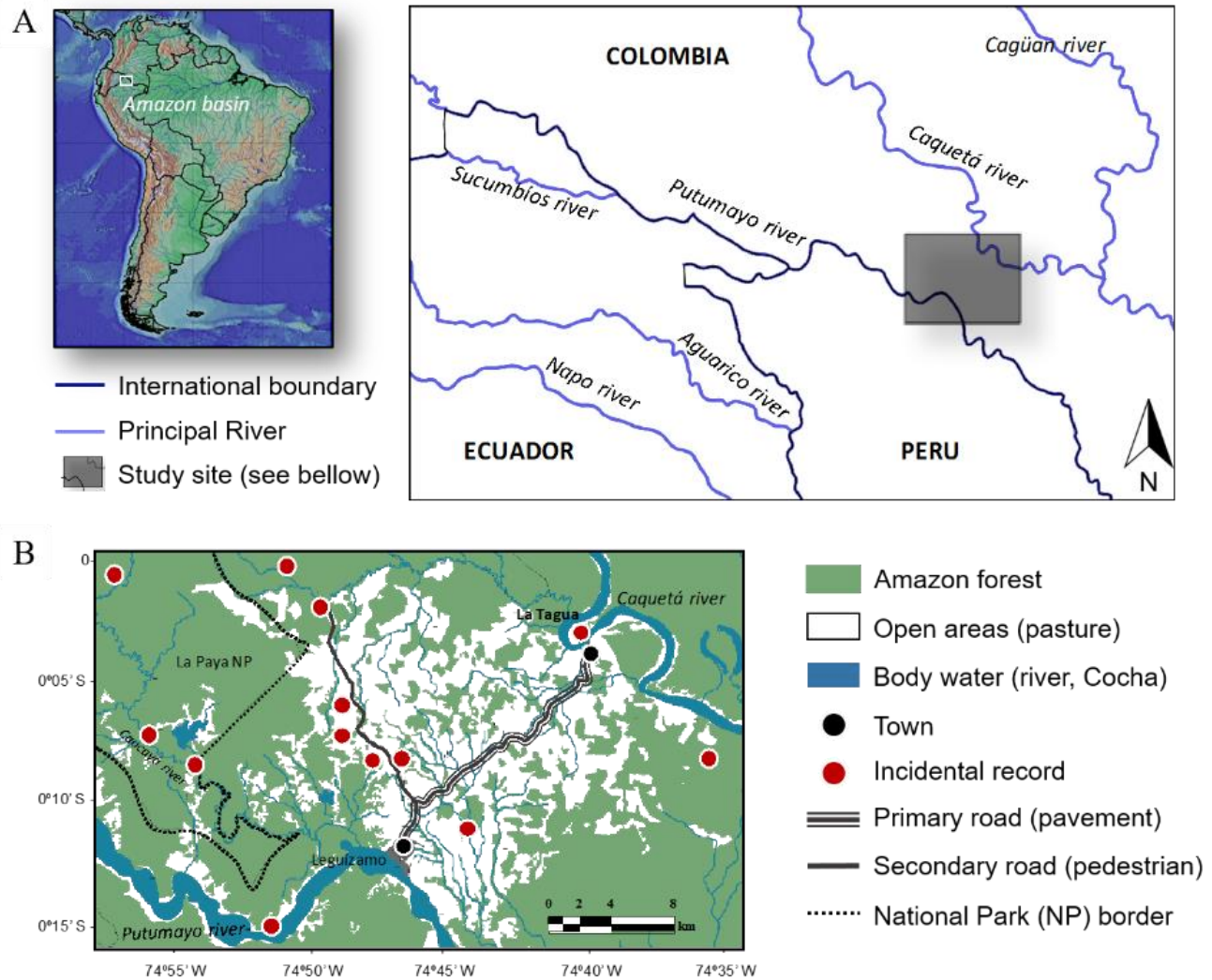
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Several areas within the Amazon region of Colombia have been deforested in recent decades (Etter et al. 2006). Deforestation is a recognized threat for biodiversity, modifying the distribution, function and composition of the biota worldwide (Ibarra & Martin 2015). The combination of fast deforestation trends with few information available about the current status of the Colombian Amazon biota, highlight the alarming situation of this Neotropical region, especially at remote areas nearby the country's borders. Therefore, any information available of the biota for the region can support current and future research or conservation initiatives. In this note we present incidental records of mammals within the municipality of Leguízamo, Putumayo, at the southern border of Colombia.

Leguízamo is located within the interfluvial region of the middle Caquetá and Putumayo river basins, the two primary Colombian tributaries to the Amazon river (Figure 1). This location has representative lowland Amazon forests such as unflooded and flooded forests. Deforestation has been concentrated mainly in unflooded forests, especially throughout the road that connects Leguízamo with La Tagua towns, over the Putumayo and Caquetá rivers respectively (Figure 1B). This primary road includes mainly open areas and pastures, with forest patches of different size and level of disturbance. Leguízamo has also a diverse and interesting anthropological mixture including on its territory different indigenous cultures (i.e. Siona, Coreguaje, Nasa, Murui-Muinane, and Kichwa-Inga), African descent groups, Mestizo-Amazonian people, and colonists from different parts of Colombia. Furthermore, there is a National Park in the region, La Paya National Park, which is located along the Caucajá river basin, a tributary of the Putumayo river. Previous assessments of mammals from Leguízamo include a recent review by Ramírez-Chaves et al. (2013) and a rapid ecological assessment within La Paya National Park (Polanco et al. 2000). There is no other recent published information regarding the mammal status in and around the National Park. Along with high deforestation rates in the area, the socioeconomic condition of local communities and the lack of environmental education programs in the region have likely increased the threats for mammals in the region (e.g. hunting, local pet-market), with the magnitude of such threats still undetermined.

Between February and September of 2015, we visited different sites along the Leguízamo jurisdiction, as part of an ornithological survey and education project (Acevedo-Charry et al. unpublished data). During fieldwork, some mammals were recorded, not systematically, through direct observation, tracks and incidental captures in mist-nets, which served as evidence and were used for taxonomic confirmation. Specimens collected were deposited in the “Alberto Cadena García” mammal collection of the Instituto de Ciencias Naturales, at the Universidad Nacional de Colombia in Bogotá (Appendix 1 in Supporting Information). In addition, some species were recognized from informal interviews with local people and were included as potentially present but acknowledging the need for further confirmation. Our aim is to present these incidental mammal records as a contribution and support of the ongoing research in the Amazon region of Colombia.



**Figure 1.** (A) Location of the Leguizamo municipality in the Amazon basin and (B) overview of the forest-no forest matrix where incidental records were obtained.

Overall, we recorded 24 species of mammals, including 20 species recorded by direct observation, eight species by incidental collection, and four species by indirect records during conversations with the local people (Table 1, Fig. 2). Five species represent new additions to the list of mammals of this part of Putumayo (cf. Polanco et al. 2000, Ramirez et al. 2013). Six of the recorded species are considered of conservation concern (Near Threatened or Vulnerable; *Priodontes maximus*, *Lagothrix lagotricha*, *Cheracebus medemi*, *Panthera onca*, *Tapirus terrestris*) and two species are considered as Data Deficient (*Microsciurus flaviventer*, *Inia geoffrensis*). Additionally, some of our incidental records were obtained from wild meat meals offered during our fieldwork (i.e. *Cuniculus paca*, *T. terrestris*, *Tayassu pecari*), highlighting the need for assessing the magnitude of such threat across the Colombian Amazon region, given the recognized effects of hunting on numerous mammal populations (Benítez et al. 2017).

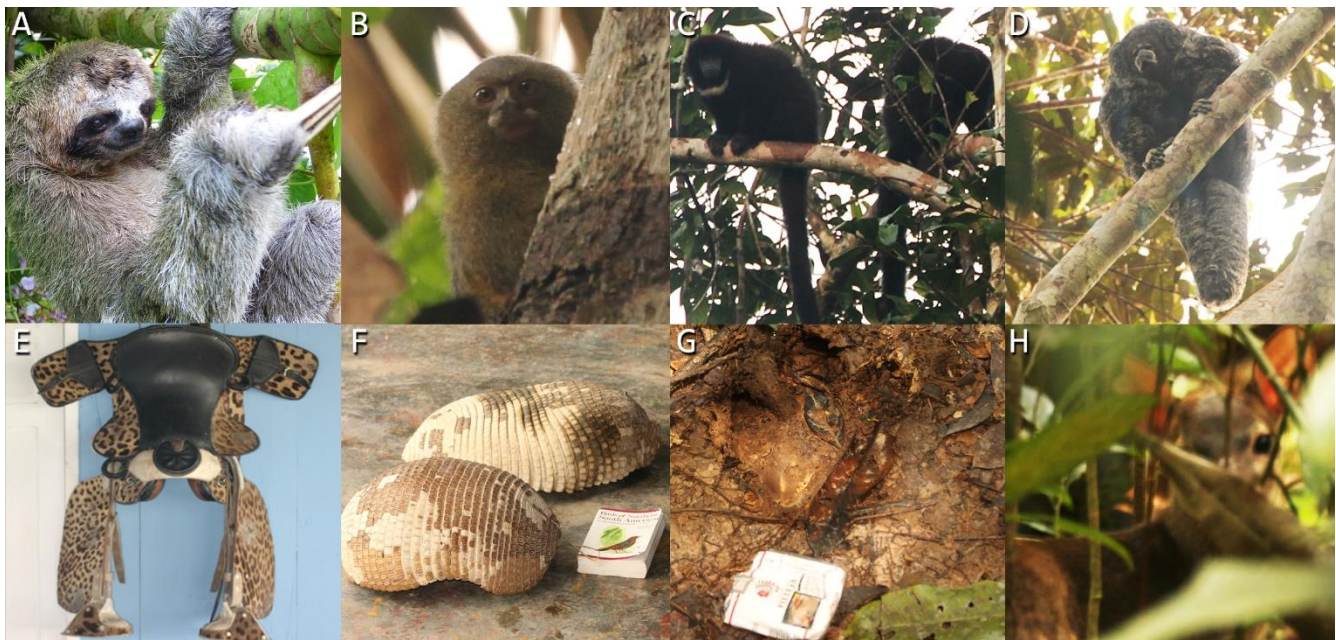
**Table 1.** List of mammal species recorded incidentally in Leguízamo during 2015. The conservation status is given in parenthesis after the name: DD: Data Deficient, VU: Vulnerable, Least Concern is not shown. Type of record denotes: indirect records of potential species from interview with photo (I<sup>F</sup>) or served as food (I<sup>S</sup>), direct observation (O), observation with photo (O<sup>F</sup>), foot print with photo (F<sup>F</sup>), or collected (C). \* indicates new additions to the species list of mammals in Leguízamo. ^ indicates species recorded not directly (I<sup>F</sup>, I<sup>S</sup>), and require further confirmation in the zone.

Order (Family)	Species	Type of record	Evidence; coordinates, (date)
Cingulata	(Dasypodidae) <i>Priodontes maximus</i> (VU)^*	I <sup>F</sup>	Figure 2F
Pilosa	(Bradypodidae) <i>Bradypus variegatus</i> <i>Choloepus hoffmani</i>	O <sup>F</sup>	Figure 2A; -0.197972, -74.948556 (June 7)
		O	-0.100275, -74.806417 (August 7)
Primates	(Atelidae) <i>Lagotrix lagotricha</i> (VU)	O	-0.128639, -74.590667 (June 13); -0.137775, -74.097444 (August 15)
	(Callithridae) <i>Cebuella pygmaea</i> <i>Saguinus nigricollis</i>	O <sup>F</sup>	Figure 2B; -0.127333, -74.797111 (May 26)
		O	-0.014083, -74.956333 (June 12)
	(Pitheciidae) <i>Cheracebus medemi</i> (VU)	O <sup>F</sup>	Figure 2C; -0.173611, -74.735944 (June 1); -0.018083, -74.952778 (June 11)
		<i>Pithecia monachus (sensu lato)</i>	O <sup>F</sup>
	Rodentia	(Sciuridae) <i>Microsciurus flaviventer</i> (DD)	O
(Caviidae) <i>Hydrochoerus hydrochaeris</i>		O	-0.098944, -74.803306 (May 26)
(Cuniculidae) <i>Cuniculus paca</i> <sup>^</sup>		I <sup>S</sup>	-
Chiroptera	(Phyllostomidae) <i>Mimon crenulatum</i> * <i>Phyllostomus elongatus</i> <i>Phyllostomus discolor</i> <i>Tonatia saurophila</i> * <i>Carollia brevicauda</i> * <i>Rhinophylla fischerae</i> <i>Rhinophylla pumilio</i> <i>Trinycteris nicefori</i> *	C	ICN-22004
		C	ICN-22000
		C	ICN-22009
		C	ICN-22007
		C	ICN-22002, 22003
		C	ICN-22005
		C	ICN-22001, 22006
		C	ICN-22008
Carnivora	(Felidae) <i>Panthera onca</i> <sup>^</sup> (NT)	I <sup>F</sup>	Figure 2E
Perissodactyla	(Tapiridae) <i>Tapirus terrestris</i> (VU)	F <sup>F</sup> , I <sup>S</sup>	Figure 2G; 0.003, -74.857356 (May 27)
Artiodactyla	(Tayassuidae) <i>Tayassu pecari</i> <sup>^</sup> (VU)	I <sup>S</sup>	-
	(Cervidae) <i>Mazama nemorivaga</i>	O <sup>F</sup>	Figure 2H; -0.015361, -74.955389 (May 27)
Cetacea	(Platanistidae) <i>Inia geoffrensis</i> (DD)	O	Along the Caucaýá river (February 14, May 9, June 10)

Although our preliminary inventory is incidental and did not follow a systematic design, we recognize the high diversity of monkeys (Primates: 5 spp.). Some monkey species were recorded in forest patches in the Leguízamo-La Tagua primary road and adjacent trails (*Callithrix* (*Cebuella*) *pygmaea*, *C. medemi*, *Pithecia monachus*), far to the National Park boundary. The Pygmy Marmoset (*C. pygmaea*) has been previously recorded on degraded and edge habitats (Defler 2010), thus is not surprising to have recorded it on fragmented forest patches in the area. In contrast, the Colombian Black-handed Titi (*C. medemi*) has little information available and no systematic or long-term studies has been conducted since its description (Lawrence 2016). This titi was originally described from the Mecaya river, a tributary of the Caquetá river northwestern to our field sites. Although there are not apparent environmental barriers, other than the recently deforested areas, recent assessments of its distribution indicated that the species did not reach the eastern part of Leguízamo. Veiga & Palacios (2008) recognized habitat loss as the major threat to *C. medemi*, therefore, its presence in this fragmented matrix resulted unexpected. Additionally, we highlight the record of the Monk Saki (*P. monachus sensu lato*) for which its taxonomy was recently discussed, now recognizing 16 species within the complex (Marsh 2014). According to this, previous Saki records in Leguízamo could be likely assigned to *P. milleri*, but considering that *P. hirsuta* was recorded in a locality less than 400 km southeast of Leguízamo (Cara-Paraná river), the distribution boundaries between these two species is yet unclear and that there are not apparent natural environmental barriers between these localities. Given sexual dimorphism and pelage age variation, which complicated our determination in the field, here we presented our records as simple as Monk Saki *Pithecia monachus* (*sensu lato*) (see the Supporting Information).

Furthermore, we report eight bat species, four of which represent new records for Leguízamo: *Mimon crenulatum*, *Tonatia saurophila*, *Carollia brevicauda* and *Trinycteris nicefori*; the *T. nicefori* record is also the first for the Putumayo department. To date, 32 species of bats are confirmed for this region of the Putumayo department (Polanco et al. 2000, Ramirez-Chaves et al. 2013) but recent studies in La Paya National Park potentially indicate a highest expected bat diversity for the region (Henao-Rodríguez, unpublished data).





**Figure 2.** Some mammals recorded in Leguízamo, Putumayo, Colombia (see extended figures in Supplementary information). (A) Brown-throated Sloth (*Bradypus variegatus*), (B) Pygmy Marmoset (*Cebuella pygmaea*), (C) Colombian Black-handed Titi (*Cheracebus medemi*), (D) Monk Saki (*Pithecia monachus*; see text), (E) horse saddles made from Jaguar fur (*Panthera onca*), (F) Two shells of Giant Armadillo (*Priodontes maximus*), (G) foot print of a Lowland Tapir (*Tapirus terrestris*) and (H) Amazonian Brown Brocket (*Mazama nemorivaga*) (Photo credits: A: Diego Rocha; B-H: Orlando Acevedo-Charry).

In conclusion, much remains to be learned about the mammals of Leguízamo given the lack of studies, and especially considering the extensive deforestation and hunting pressure operating in the area. Some species herein reported could already be extinct from the region (e.g. *P. onca* in Figure 2E), but others are still present and likely need urgent conservation efforts. Restoration efforts to reconnect the western and eastern forests seems warranted for the conservation of mammals in Leguízamo, but should include intense environmental education and community outreach activities. Several strategies to include the local community in the conservation of the Amazon region, including Leguízamo, would be fundamental to ensure the protection of the Amazonian biota.

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