



First confirmed records of the Pantanal Cat, *Leopardus colocola braccatus* (Cope, 1889), in the state of São Paulo, Brazil

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Abstract

The Pantanal Cat, *Leopardus colocola braccatus*, presents a broad distribution over several biomes in South America. However, the distribution of the species is based on a limited number of occurrences, and confirmed records of the species are scarce. Here, we present 2 confirmed records of *Leopardus colocola braccatus* from the state of São Paulo, southeast Brazil. Both records are juvenile individuals, 1 recorded in the municipality of Castilho and the other in Araçatuba. These São Paulo records expand the distribution of this uncommon felid to the most populous state of Brazil. This species is currently Data Deficient on the São Paulo Red List, and these new records may help with future assessments of the conservation status of this felid.

Keywords

Cerrado; *colocola* group; Felidae; Pampas cat; urban area.

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Introduction

The Pantanal Cat, *Leopardus colocola braccatus* (Cope, 1889) sensu Kitchener et al. (2017) is a small-bodied South American felid (total length 60–100 cm, body mass 3–3.8 kg) that is distributed from northeast Brazil to Bolivia and Paraguay (García-Perea 1994, Barstow and Leslie 2012, Nascimento et al. 2016). The Pantanal Cat has been classified either as a subspecies of *Leopardus colocola* (Molina, 1782) (Cabrera 1958) or as a full species (García-Perea 1994, Wozencraft 2005, Nascimento

2010, Nascimento et al. 2016). Here we follow the taxonomic arrangement proposed by Kitchener et al. (2017), who recognized it as a subspecies of *L. colocola*.

Despite a wide geographical distribution, records of Pantanal Cat in the wild are few (Silveira 1995, Barstow and Leslie 2012, Nascimento et al. 2016). In the state of São Paulo (southeast Brazil) this species is classified as Data Deficient in the state's Red List (São Paulo 2014). We presents 2 new confirmed records of *Leopardus colocola braccatus* from the state, with the hope that this information may support future reassessments of the

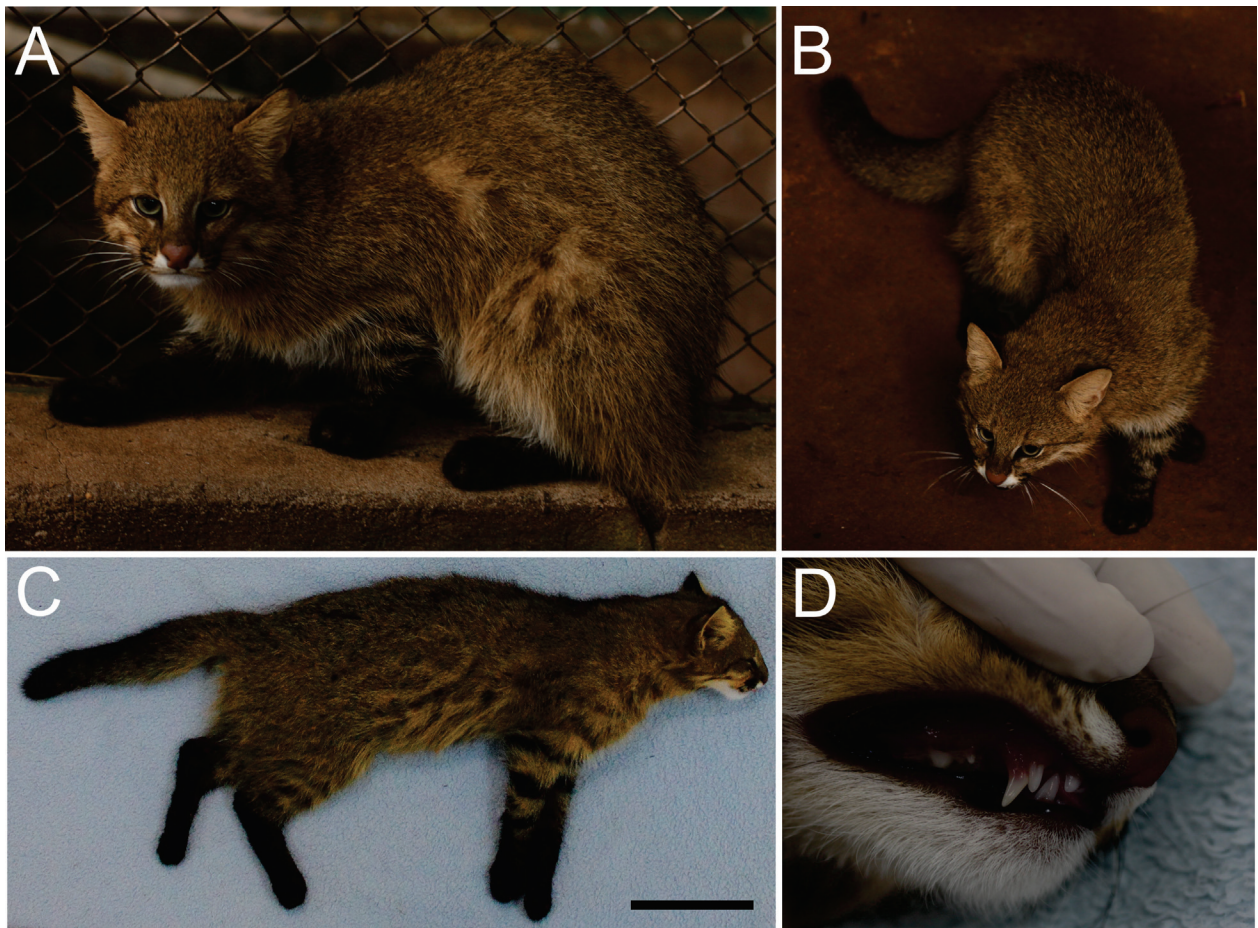


Figure 1. New record of the juvenile male of *Leopardus colocola braccatus* from Castilho, São Paulo state, Brazil. **A.** Detail of the lateral and face. **B.** Pattern of the dorsal region. **C.** Specimen in lateral view (specimen sedated for biometric procedure). **D.** Detail of the deciduous upper canine tooth. Scale bar in C = 5 cm.

conservation status of this felid in Brazil's most populous state.

Methods

The first record of the Pantanal Cat presented here (Fig. 1) corresponds to a specimen rescued by the Military Police of the state of São Paulo on 3 October 2016 in the backyard of a house in the urban area of the city Castilho, northwest São Paulo (Fig. 2). The animal was captured with a throw net by officers of the Military Police of the state of São Paulo and then transported inside a box trap to the Centro de Conservação da Fauna Silvestre de Ilha Solteira, Ilha Solteira, São Paulo, where it was sedated to check the health conditions, and to take biometric data. The individual was tagged (microchip number: 900085000391132) and kept under quarantine until it was forwarded to Parque Zoológico Municipal Quinzinho de Barros in Sorocaba, São Paulo, Brazil. All procedures were in accordance with pertinent federal environmental legislation (IN IBAMA nº23/2014). The second record reported here was obtained in September 2017 through information from veterinarians of the municipality of

Araçatuba, northwest São Paulo (Fig. 2). The individual was rescued in the rural area and further details were not available to us. However, 3 of us (LO, DRC and FCM) had a brief access to the individual and confirmed the identification.

Results

Castilho record. Brazil, northwest São Paulo, Castilho (20°51' S, 051°28' W, GPS accuracy 25 m, 350 m elevation). The climate of the locality is type AW, tropical Cerrado biome with a dry season in the winter (Kottek et al. 2006). The locality is surrounded by Cerrado fragments, semideciduous forest, pastures and sugarcane crops.

Identification. The specimen was a male (Fig. 1A–C), with the following measurements: body mass 1.570 g, head–body length 450 mm, tail length 260 mm. The pendulous scrotum was absent and the deciduous upper canines were present (Fig. 1D), suggesting that the animal was a late juvenile (i.e., age class III) as defined by Ximénez (1974) and García-Perea (2002). The animal

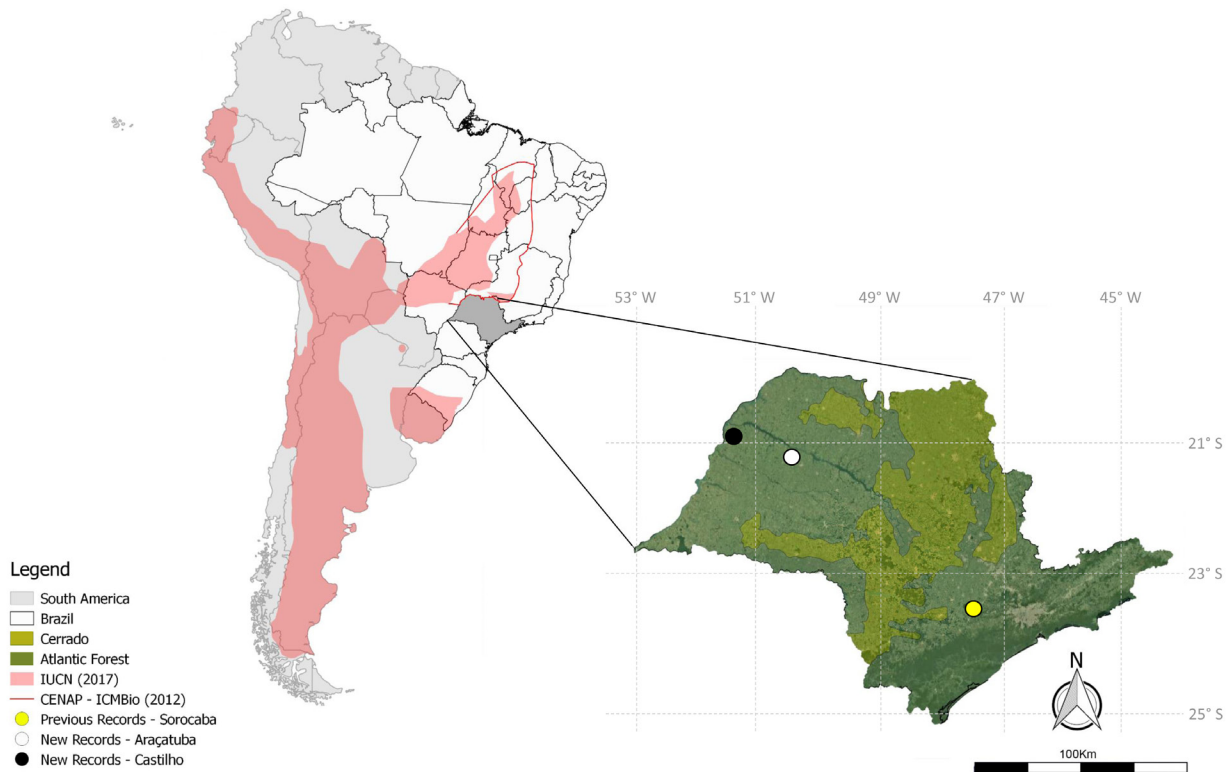


Figure 2. Records of *Leopardus colocola braccatus* in São Paulo state, Brazil. The black and white circles point the location of the 2 new records presented in Castilho and Araçatuba. The yellow circle refers to the record described in Oliveira (1994). We highlight the range of *L. colocola braccatus* in South America (courtesy IUCN Red List 2017) and the modification made by CENAP- ICMBio (2012) (see Queirolo et al. 2013). For details on the distribution of this subspecies in the Brazilian territory check Nascimento et al. (2016).

was identified mainly by its pelage. The pelage was fairly uniformly pale brown to orangish, with faint marks of rosettes on the flanks, neck, and near the spinal crest. The spinal crest of the specimen was darker than the background color. The tip of the tail was black, and it did not present black rings. There were 3 heavy black stripes around the front legs, although the distal-most stripe merged with the black boots at the posterior part of the legs. The posterior legs presented 3 or 4 black stripes not as well-defined as in the front legs. All 4 feet presented the black boots covering the paws dorsally and ventrally, including on the wrists and ankles. The pelage observed in this specimen is similar to the “Type 3A” of García-Perea (1994) and, according to Barstow and Leslie (2012), the presence of the black boot pattern on the 4 legs readily assign this specimen to the subspecies *L. b. braccatus*.

Araçatuba record. Brazil, northwest São Paulo, Araçatuba (ca 21°12' S, 050°25' W, GPS accuracy 25 m, 390 m elevation). The climate of the locality is type AW, tropical Cerrado biome with a dry season in the winter (Kottek et al. 2006). Cerrado fragments, semideciduous forest, pastures and sugarcane crops are present in the region.

Identification. This specimen is a male with the following measurements: body mass 1.448 g, head–body length 370 mm, tail length 230 mm. Our direct observations indicate a pelage pattern having the same characteristics of the Castilho record described above.

Discussion

The known range of Pantanal Cat in Brazil includes the states of Mato Grosso, Mato Grosso do Sul, Goiás, Tocantins, Minas Gerais, Bahia, Piauí, Maranhão (see details in Nascimento et al. 2016), and now São Paulo (Fig. 2). The occurrence of this felid in Brazil is contiguous with the its range in eastern Paraguay and Bolivia (García-Perea 1994, Bagno et al. 2004, Chébez et al. 2008, Soljan et al. 2010, Barstow and Leslie 2012, Luque et al. 2012, Nascimento et al. 2016).

Prior to the specimens reported here, the presence of Pantanal Cat in São Paulo was unclear. One previous work (Bagno et al. 2004) mentioned an individual observed in 1996 in the municipality of Ilha Solteira, which is at the border between the states of São Paulo and Mato Grosso do Sul. Our recent inquiry to the data log of the Centro de Conservação da Fauna Silvestre de Ilha Solteira, where this specimen was supposedly vouchered, retrieved 1 record for this species collected in 1994. This specimen was brought by a local to the institution and most likely represents the record cited in Bagno et al. (2004). However, the exact provenance of this specimen is unrecorded, and the coordinates given by Bagno et al. (2004: 76) correspond to the municipality of Aparecida do Taboado, in the state of Mato Grosso do Sul, not São Paulo. An additional record of this species in São Paulo is based on a capture in Sorocaba in 1987 (see Oliveira 1994; Fig. 2). The confirmed records of Panta-

nal Cat in the state of São Paulo presented herein pose questions about its unexpected occurrence of the taxon at these locations. The border between the states of São Paulo and Mato Grosso do Sul is marked by the Paraná River, which reaches more than 1 km wide in that region, and approximately 5 km wide at the dam reservoir, and is considered an effective barrier for several species of mammals (Johnson et al. 1999, Aguiar et al. 2007, Queirolo et al. 2013). As such, we established 2 hypotheses to explain the presence of Pantanal Cat in the northwest São Paulo: (i) there were 2 recent dispersions from Mato Grosso do Sul, possibly via the Engenheiro Souza Dias hydroelectric plant, or perhaps via a longer route from Minas Gerais, and (ii) we have identified a population of Pantanal Cat living in the state of São Paulo. The occurrence of this species in the region of Sorocaba (Oliveira 1994) suggests that there could be a widespread population in the state of São Paulo. However, at this point there is no compelling evidence to select between the competing hypotheses. Additional records from the state, and molecular analyses could help in understanding the origins of the specimens in São Paulo state. Thus, based on current knowledge, the São Paulo specimens represent new occurrences at the southeastern limit of the Pantanal Cat's distribution (see map in IUCN 2017).

The International Union for the Conservation of Nature Red List classifies *L. colocola* as Near Threatened (Lucherini et al. 2016) and the species is included on CITES Appendix II. In Brazil, *Leopardus colocola* is considered Vulnerable on the ICMBio Brazilian Red List (Queirolo et al. 2013, ICMBio 2016, MMA 2014). In the state lists (Minas Gerais (*L. c. braccatus*), Rio Grande do Sul (*L. c. munoai*), and Bahia (*L. c. braccatus*)), this species or its subspecies are Endangered (COPAM 2010, Rio Grande do Sul, 2014, Bianconi et al. 2017). The Pantanal Cat is assigned to the Data Deficient category in the Red List of the state of São Paulo (São Paulo 2014).

The Pantanal Cat occurs in low densities (0.01–0.05 individuals/km²), even in the few places where it is relatively common (0.1–0.2/km²) (Oliveira et al. 2010, Queirolo et al. 2013). The low population densities of this species could be one of the factors that leads it not being recorded before in the state of São Paulo. Previous authors pointed out the rarity of the species compared to other Neotropical cats, including in captivity and museum collections (Silveira 1995, Barstow and Leslie 2012, Nascimento et al. 2016).

When a species becomes threatened, it often persists at the periphery of its historical geographical range in greater numbers than elsewhere (Burbidge and McKenzie 1989, Channell and Lomolino 2000), making peripheral populations important for conservation of the species. Additionally, conservation of peripheral populations is important in maintaining the genetic heterozygosity of a species (Young and Clarke 2000). Thus, small isolated populations, like that possibly present in northwest São Paulo, are important for the conservation of this species and should be protected.

Although, these new occurrences are not enough data to assign a conservation rank other than Data Deficient in São Paulo state, this information is now available and could be cited by the environmental agencies in the state in support for greater specific information about the subspecies in environmental impact assessments or monitoring. The presence of an emblematic animal, such any cat, in the most populous and arguably among the best studied state of the country is an example of how insufficient our knowledge is of the biodiversity in Brazil.

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Authors' Contributions

CPBB compiled the data on species distribution, prepared table and figures, and wrote the paper. MCC wrote the paper. DCR, LOS and JHPD collected the biometric data. FCM collected the biometric data, prepared table and figures, and wrote the paper.

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