



MEDIUM TO LARGE-SIZED MAMMALS OF A PROTECTED AREA IN THE CERRADO HOTSPOT

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Abstract: Species surveys are one of the first steps to implement conservation actions. Previous studies carried out in the state of São Paulo, Brazil, have provided relatively comprehensive knowledge about its medium to large-sized mammals, but there is a gap of information concerning this group in the Cerrado protected areas. In this work, we used data collected from camera traps between 2011 and 2022 to identify medium to large-sized mammal species from Furnas do Bom Jesus State Park, a protected area in the Cerrado hotspot, in the municipality of Pedregulho, state of São Paulo, Brazil. We estimated observed and expected (first-order Jackknife estimator) species richness and the species accumulation curve to assess sampling sufficiency. We recorded 31 mammal species, 26 of which were native (six of which are classified as threatened to extinction) and five of which were exotic. The Jackknife-1 species richness estimator indicated a potential of up to 39 species. This comprehensive species inventory provides valuable foundational data for future ecological and conservation research in the region. The presence of top predator species underscores the ecological relevance of the area. However, increasing pressure from exotic species and habitat fragmentation can pose significant threats to local biodiversity.

Keywords: biodiversity; biodiversity conservation; camera trap; inventory; taxonomic list.

INTRODUCTION

Brazil is internationally recognized for hosting two of the 34 priority biodiversity hotspots, the Atlantic Forest and the Cerrado (Mittermeier et al. 2004). Protected areas play a crucial roles in protecting and preserving the species and ecosystems found in these biomes (Young & Medeiros 2018). In addition, these areas can promote scientific

research and environmental education, as well as areas for tourism (Silva 2005). Brazil has 3,119 protected areas, covering 19.16% of its terrestrial territory; of these, 68.1% are for sustainable use, while 31.9% are strictly protected (MMA 2025). The Cerrado has 600 protected areas, which account for 9.56% of the biome's total area (MMA 2025). The safeguarding provided by protected areas is essential for mitigating habitat loss and achieving

international goals (Gonçalves-Souza et al. 2021). However, recent rollbacks in environmental legislation have compromised this, underscoring the necessity of strengthening laws to effectively reduce environmental destruction (Gonçalves-Souza et al. 2021).

The state of São Paulo harbors approximately 33% of Brazil's mammal species (Galetti et al. 2022), a diversity sustained by heterogeneously distinct ecosystems, which provide complex habitats that support a wide range of wildlife (Vivo et al. 2011, Galetti et al. 2022). The mammal populations of the Cerrado, dry forests, and open savannas are less well known than those in regions with large remaining forest habitats, such as the Serra do Mar Biodiversity Corridor (Galetti et al. 2022), and are generally more vulnerable to extinction (Stevens et al. 2017). In the last 35 years, more than half of the two million km² of the Cerrado has been transformed into agricultural landscapes (Klink & Machado 2005). In the state of São Paulo, only 0.22% of the Cerrado biome is protected across 41 protected areas (MMA 2025). According to the geomorphologic division of the state of São Paulo, there is an unbalanced distribution of protected areas across biomes and regions. The northern portion of the state, known as the Western Plateau, is largely composed of small fragments of savanna, semi-deciduous and deciduous forests. These areas, especially the Cerrado, contain few protected areas and are among the most threatened in the state lacking effective protection (Rodrigues 2008).

In this context, wildlife inventories and monitoring play indispensable roles in biodiversity conservation. Inventories map biodiversity, providing an overview of the current state of ecosystems (Stephenson et al. 2022). Long-term monitoring, on the other hand, allows the identification of trends and changes over time, offering a solid foundation for adaptive and effective conservation actions (Havstad & Herrick 2003). These tools are strategic for addressing the global biodiversity crisis by assessing the impact of initiatives such as the establishment of protected areas and ecosystem restoration, while enabling adjustments based on scientific data (Stephenson et al. 2022). Promoting a culture that values monitoring and evidence-based management is crucial to ensure that conservation resources are efficiently allocated, maximizing positive

impacts and avoiding wasteful, ineffective actions (Stephenson et al. 2022).

Furnas do Bom Jesus State Park, established in 1989 (São Paulo 1989), represents a protected area isolated in the northeastern region of the state of São Paulo. The vegetation of the park consists of remnants of Cerrado and Atlantic Forest at relatively high altitudes, forming a transitional area (Branco et al. 1991, Sasaki & Mello-Silva 2008). These transition zones between two distinct habitat types or ecosystems, where the characteristics of biotic and abiotic communities blend, are called ecotones (Kolasa & Zalewski 1995). As they contain characteristic representatives of both adjacent ecosystems, ecotones can harbor greater species richness and can play a role in connectivity and biodiversity maintenance in the landscape (Kark 2013). Many anthropogenic pressures are present in the park's surroundings, such as agricultural areas, pastures, urban areas, and the presence of exotic species (Branco et al. 1991), which can have important impacts on the presence of native and wild species in the region. Thus, this study aimed to inventory medium- and large-sized mammal species in Furnas do Bom Jesus State Park, highlighting the importance of this protected area and species surveys to support basic ecological knowledge and the allocation of resources for conservation.

MATERIAL AND METHODS

Study area

Data were collected in the Furnas do Bom Jesus State Park (PEFBJ; 20°11'14"/16'34" S and 47°22'13"/29'17" W) in the municipality of Pedregulho, northeastern region of the state of São Paulo, near the border with the state of Minas Gerais (Figure 1). The municipality is predominantly composed of agricultural landscapes, with a wide predominance of coffee and sugarcane plantations. The PEFBJ covers 2,069 ha and is characterized by its geomorphological structure of cliffs and escarpments, with slopes of less than 12° in certain regions and altitudes ranging from 635 to 1,035 m (Branco et al. 1991). The vegetation in the park consists of seasonal semideciduous forest formations, low scrublands in the more preserved areas at the bottom of the cliffs, and remnants of Cerrado and Atlantic Forest

at higher altitudes, as reported in the studies by Branco et al. (1991) and Sasaki & Mello-Silva (2008). The Cerrado physiognomy of the uppermost portions of the surrounding plateaus has been mostly replaced by coffee crops and pastures. Other areas of agricultural exploitation, such as sugarcane, and urban areas, also contribute to this landscape (Branco et al. 1991). The climate is characterized as a Subtropical highland climate (CWB), with an annual average temperature of 20.1°C (13.7°C minimum - 26.5°C maximum). The average annual precipitation is 1,545 mm (CEPAGRI 2016).

Data collection

Camera traps (Bushnell® Trophy Cam 6.0 Mpxl and Reconyx® HyperFire 2) were utilized to record the occurrence of medium and large-sized mammals in the PEFBJ. Equipment was affixed to tree trunks, which were positioned approximately 30-40 cm above the ground. They were set to operate continuously (i.e., during 24h), capturing three photos every 10 seconds once triggered for at least 60 consecutive days. The camera traps recorded the date and time of each picture, and records taken \geq 60 min apart by the same camera were considered independent records (Sollmann 2018).

Data collection was conducted in four sampling blocks from 2011 to 2022, which differed in some methodological aspects, such as the operating period of the camera traps, the number of sampling points, the distance between camera traps, the use of baits, and the sampling effort used in each campaign (Table 1; Figure 1). Bobcat urine was used as bait exclusively in 2011, with revisits every five days for replacement. The batteries were checked and replaced every 30 days. The sampling effort corresponds to the number of sampling points multiplied by the number of days the camera traps remained active. Data collection was performed under license number 10/2020 from the Municipal Secretariat of Environment (Process number: 14/000.623/2020) and the Scientific Committee of Forestry Institute (Process number: 260108 - 005.403/2011).

Data analysis

We uploaded all records to the Wildlife Insights platform (Wildlife Insights 2025), where they

were screened and identified to the most specific taxonomic level. The nomenclature followed the proposal of Abreu et al. (2024). The conservation status of the species was assessed at three levels: regional (São Paulo 2018), national (ICMBio 2025), and international (IUCN 2024). Species not naturally occurring in the region were classified as exotic, according to Falk-Petersen et al. (2006).

After organizing the records of the different species, the estimated observed species richness was calculated using the “specnumber” function. To estimate the extrapolated species richness, the first-order Jackknife estimator was applied using the “specpool” function. To evaluate the sufficiency of the sampling effort and the representativeness of the collected data, we generated a species accumulation curve using the “specaccum” function. This analysis graphically shows how the accumulated number of species increases with increasing sampling effort over time. Given the variation in sampling effort across campaigns, species records were standardized by calculating the relative frequency. This metric was obtained by dividing the number of records of each species in a correspondent period by the corresponding sampling effort for that year. The analyses were performed using the “Vegan” package (Oksanen et al. 2022), and “ggplot2” package (Wickham 2016) was used for data visualization, both in the R programming language (R Core Team 2023).

RESULTS

A total of 932 independent records were obtained, corresponding to an observed richness of 31 species of mammals belonging to 17 families (Table 2; Figure 2). Twenty-six species were native, and five species were exotic (Table 2). The Jackknife-1 estimator showed an estimated richness of 39.88 ± 3.11 species, an increase of eight mammal species from the observed richness. The species accumulation curve showed a rapid initial increase in the accumulated number of species, followed by a reduction in the species increase with increasing sample size, although not stabilizing (Figure 3). Since the curve is close to reaching a plateau, it indicates that the sampling effort was sufficient to detect most of the species present in the study

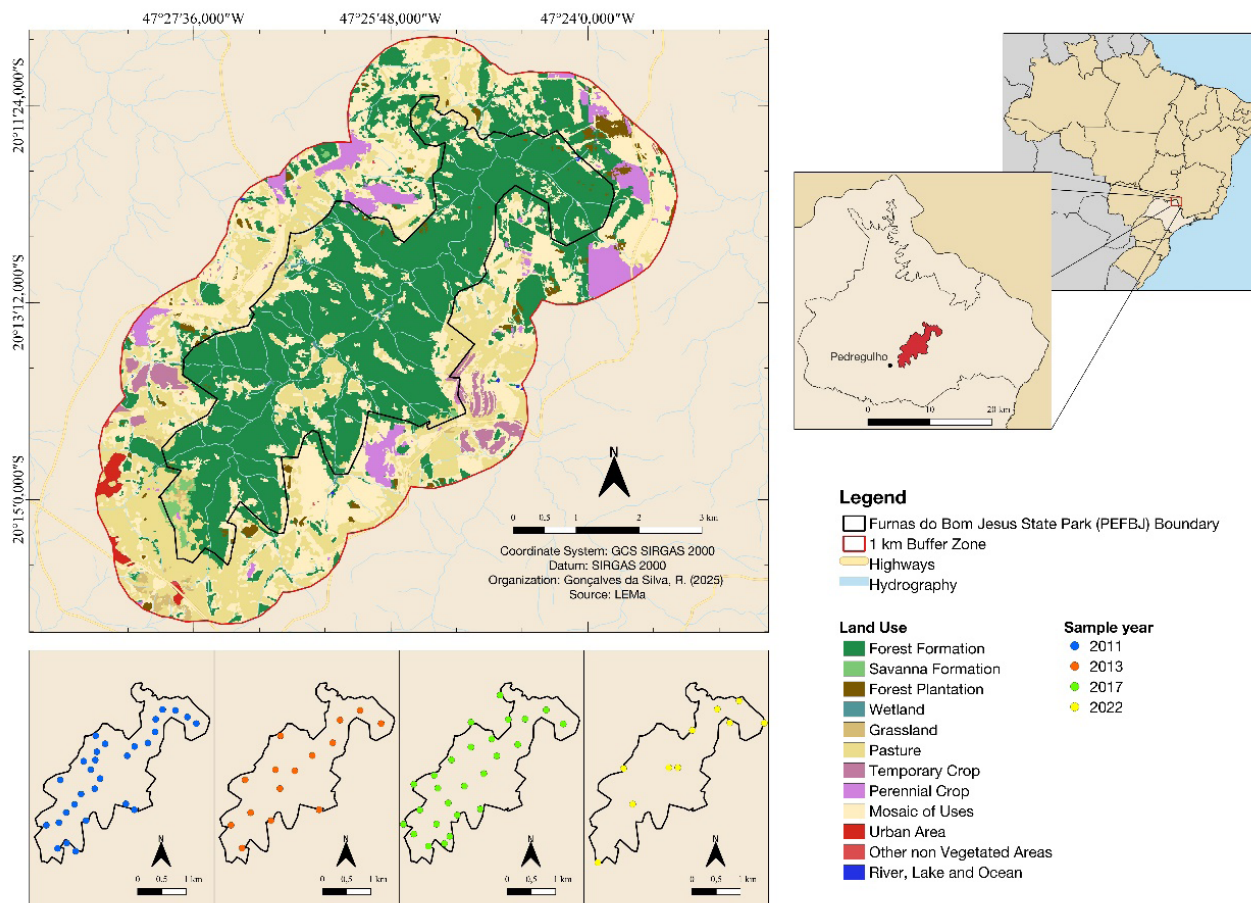


Figure 1. Map of the study area showing the perimeter of the Furnas do Bom Jesus State Park and its surroundings in the municipality of Pedregulho, state of São Paulo, Brazil. The map highlights different land uses. The black line represents the perimeter of the park, the red line indicates a 1,000-meter buffer, the blue lines represent rivers, and the yellow lines represent highways. In the lower portion of the map, the sampling designs from the four sampling periods are shown. The blue circles represent the sampling points from 2011, the orange circles represent those from 2013, the green circles represent those from 2017, and the yellow circles represent those from 2022.

Table 1. Description of the sampling of medium to large-sized mammals carried out between 2011 and 2022 at Furnas do Bom Jesus State Park, state of São Paulo, Brazil. Each sampling point received one camera trap, which remained active for 60 consecutive days.

Year	Sampling period	Sampling points	Minimum distance between points (m)	Bait	Sample effort (camera-trap days)
2011	July to December	29	500	Yes	4770
2013	July to December	15	1000	No	1385
2017	January to August	26	1000	No	3572
2020-2022	December/2020 to August/2022	10	2000	No	1092

area, although a few additional species may still be recorded with further sampling.

The lowland paca (*Cuniculus paca*) was the most recorded species (N = 125 independent records),

followed by the tayra (*Eira barbara*; N = 119), the nine-banded armadillo (*Dasypus novemcinctus*; N = 97) and the white-eared opossum (*Didelphis albiventris*; N = 94). The least recorded species (N = 1 record)

were the hoary fox (*Lycalopex vetulus*), the margay (*Leopardus wiedii*), the crab-eating raccoon (*Procyon cancrivorus*), the marmoset (*Callithrix penicillata*), and the collared peccary (*Dicotyles tajacu*). In addition, five exotic species were recorded within the park: the cattle (*Bos taurus*), the domestic dog (*Canis lupus familiaris*), the horse (*Equus caballus*), the wild boar (*Sus scrofa*) and the European hare (*Lepus europaeus*) (Figure 2).

We obtained records of 24 species in 2011, which was the only year when the hoary fox, the

six-banded armadillo (*Euphractus sexcinctus*), the hairy tree porcupine (*Coendou spinosus*), and the margay were recorded. In 2013, 19 species were recorded, with the capybara (*Hydrochoerus hydrochaeris*) added to the records. In 2017, records of 17 species were obtained, adding records of the neotropical otter (*Lontra longicaudis*), the lowland agouti (*Dasyprocta azarae*), and the black-tufted marmoset to the list. In 2022, 22 species were recorded, marking the first-time sightings of the collared peccary and the exotic species domestic

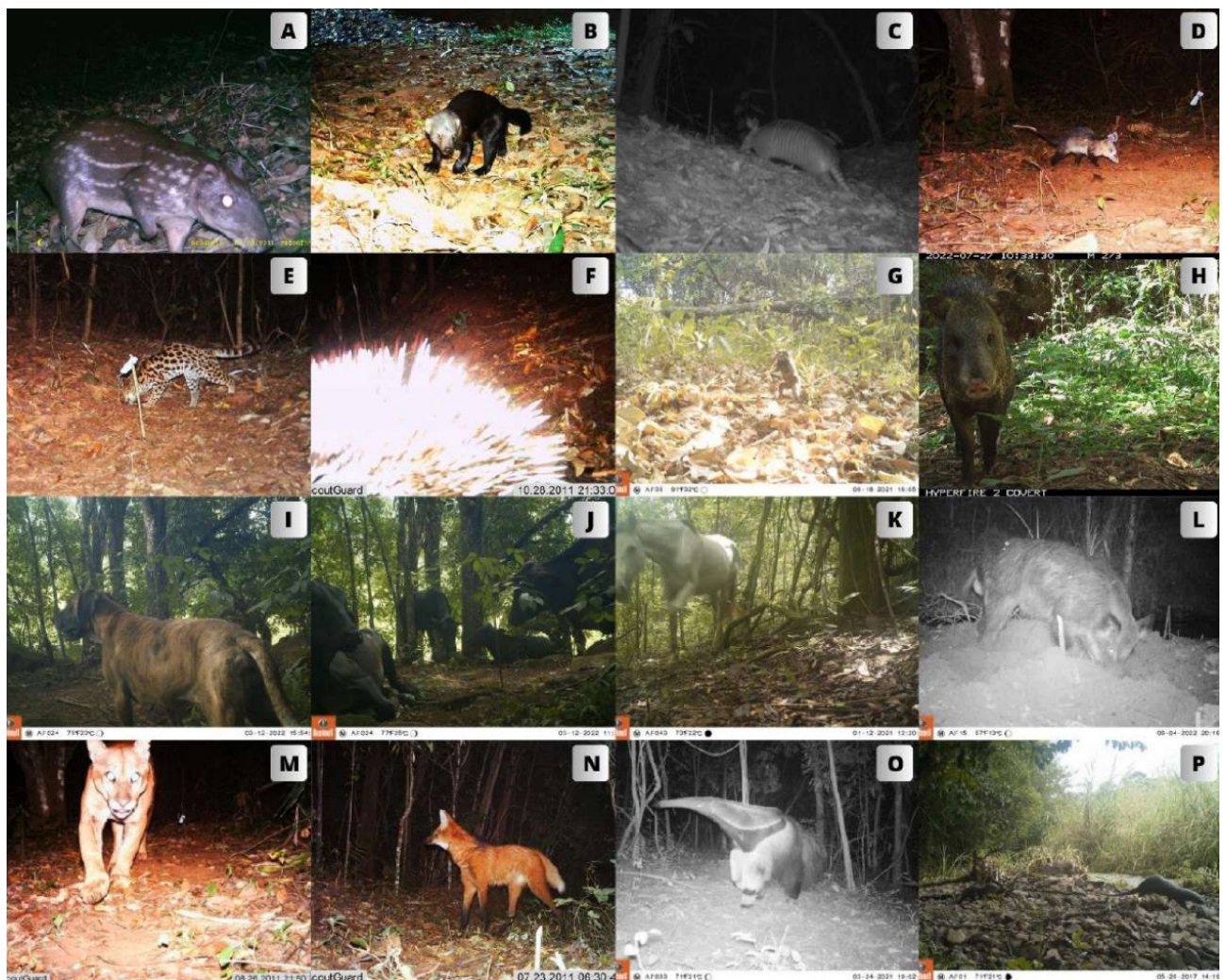


Figure 2. Mammal records from the Furnas do Bom Jesus State Park, in the municipality of Pedregulho, state of São Paulo, Brazil. A-D = Most recorded species: A. Lowland paca (*Cuniculus paca*), B. Tayra (*Eira barbara*), C. Nine-banded armadillo (*Dasypus novemcinctus*), D. White-eared opossum (*Didelphis albiventris*); E-H = Least recorded species: E. Margay (*Leopardus wiedii*), F. Hairy tree porcupine (*Coendou spinosus*), G. Black-tufted marmoset (*Callithrix penicillata*), H. Collared peccary (*Dicotyles tajacu*); I-L = Exotic species: I. Domestic dog (*Canis lupus familiaris*), J. Domestic cattle (*Bos taurus*), K. Domestic horse (*Equus caballus*), L. Wild boar (*Sus scrofa*); M-P = Threatened species: M. Puma (*Puma concolor*), N. Maned wolf (*Chrysocyon brachyurus*), O. Giant anteater (*Myrmecophaga tridactyla*), P. Neotropic otter (*Lontra longicaudis*).

Table 2. Number of independent records of medium to large-sized mammal species obtained with camera traps at Furnas do Bom Jesus State Park (PEFBJ), São Paulo State, Brazil, between 2011 and 2022. The relative frequency of the species in each period is shown in parentheses after the number of records. The conservation status of the species is shown at state (São Paulo 2018), national (Abreu et al. 2024) and global levels (IUCN 2024). Legend: LC = Least Concern; NT = Near Threatened; VU = Vulnerable; EN = Endangered. * Species that were previously registered at PEFBJ by the Forestry Foundation (Fundação Florestal 2022).

Species	Common name	2011	2013	2017	2020-2022	Total	Conservation status	
							São Paulo	Brazil
DIDELPHIMORPHA								
Didelphidae								
<i>Didelphis albiventris</i> (Lund, 1840)*	White-eared opossum	38 (0.008)	27 (0.019)	18 (0.005)	11 (0.010)	94	LC	LC
CINGULATA								
Chlamyphoridae								
<i>Cabassous</i> sp.	Naked-tailed armadillo	1 (0.0002)	5 (0.003)	0 (0)	1 (0.0009)	7		
<i>Euphractus sexcinctus</i> (Linnaeus, 1758)	Six-banded armadillo	2 (0.0004)	0 (0)	0 (0)	0 (0)	2	LC	LC
Dasyopodidae								
<i>Dasyptis novemcinctus</i> (Linnaeus, 1758)*	Nine-banded armadillo	43 (0.009)	32 (0.023)	13 (0.003)	9 (0.008)	97	LC	LC
PILOSA								
Myrmecophagidae								
<i>Myrmecophaga tridactyla</i> (Linnaeus, 1758)*	Giant anteater	12 (0.002)	23 (0.016)	6 (0.001)	16 (0.014)	57	VU	VU
<i>Tamandua tetradactyla</i> (Linnaeus, 1758)*	Southern tamandua	3 (0.0006)	7 (0.005)	3 (0.0008)	4 (0.003)	17	LC	LC
PRIMATES								
Cebidae								
<i>Callithrix penicillata</i> (É. Geoffroy 1812)	Black-tufted marmoset	0 (0)	0 (0)	1 (0.0002)	0 (0)	1	LC	LC

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Species	Common name	2011	2013	2017	2020-2022	Total	Conservation status		
							São Paulo	Brazil	IUCN
<i>Sapajus nigritus</i> (Goldfuss, 1809)*	Black-horned capuchin	3 (0.0006)	1 (0.0007)	0 (0)	1 (0.0009)	5	NT	NT	
LAGOMORPHA									
Leporidae									
<i>Lepus europaeus</i> (Pallas, 1778)	European hare	0 (0)	0 (0)	0 (0)	12 (0.010)	12	Exotic		
RODENTIA									
Caviidae									
<i>Hydrochoerus hydrochaeris</i> (Linnaeus, 1766)*	Capybara	0 (0)	2 (0.001)	1 (0.0002)	4 (0.003)	7	LC	LC	
Cuniculidae									
<i>Cuniculus paca</i> (Linnaeus, 1766)*	Lowland paca	12 (0.002)	23 (0.016)	66 (0.018)	24 (0.021)	125	LC	LC	
Dasyproctidae									
<i>Dasyprocta azarae</i> (Lichtenstein, 1823)	Azara's agouti	0 (0)	0 (0)	2 (0.0005)	0 (0)	2	LC	DD	
Erethizontidae									
<i>Coendou spinosus</i> (Cuvier, 1823)*	Hairy tree porcupine	1 (0.0002)	0 (0)	0 (0)	0 (0)	1	LC	LC	
ARTIODACTYLA									
Cervidae									
<i>Subulo gouazoubira</i> (Fischer, 1814)*	Gray brocket	2 (0.0004)	10 (0.007)	12 (0.003)	26 (0.032)	50	LC	LC	
Tayassuidae									
<i>Dicotyles tajacu</i> (Linnaeus, 1758)	Collared peccary	0 (0)	0 (0)	0 (0)	1 (0.0009)	1	LC	LC	
CARNIVORA									
Mephitidae									
<i>Conepatus semistriatus</i> (Boddaert, 1785)*	Striped hog-nosed skunk	6 (0.0001)	2 (0.001)	0 (0)	2 (0.001)	10	LC	LC	

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Species	Common name	2011	2013	2017	2020-2022	Total	Conservation status	
							São Paulo	Brazil IUCN
Mustelidae								
<i>Eira barbara</i> (Linnaeus, 1758)*	Tayra	49 (0.010)	12 (0.008)	48 (0.013)	10 (0.0009)	119	LC	LC
<i>Lontra longicaudis</i> (Olfers, 1818)	Neotropical otter	0 (0)	0 (0)	6 (0.001)	0 (0)	6	VU	NT
Procyonidae								
<i>Procyon cancrivorus</i> (Cuvier, 1798)*	Crab-eating raccoon	1 (0.0002)	12 (0.008)	9 (0.002)	28 (0.025)	50	LC	LC
<i>Nasua nasua</i> (Linnaeus, 1766)*	Brown-nosed coati	5 (0.0006)	0 (0)	0 (0)	0 (0)	5	LC	LC
Canidae								
<i>Cerdocyon thous</i> (Linnaeus, 1766)*	Crab-eating fox	9 (0.001)	4 (0.002)	0 (0)	38 (0.034)	51	LC	LC
<i>Canis lupus familiaris</i> (Linnaeus, 1753)*	Domestic dog	3 (0.0006)	6 (0.004)	10 (0.002)	3 (0.002)	22		Exotic
<i>Chrysocyon brachyurus</i> (Illiger, 1815)*	Maned wolf	4 (0.0008)	9 (0.006)	1 (0.0002)	18 (0.016)	32	VU	NT
<i>Lycalopex vetulus</i> (Lund, 1842)	Hoary fox	1 (0.0002)	0 (0)	0 (0)	0 (0)	1	VU	NT
Felidae								
<i>Herpailurus yagouaroundi</i> (É. Geoffroy, 1803)*	Jaguarundi	1 (0.0002)	5 (0.003)	1 (0.0002)	7 (0.0006)	14	NT	LC
<i>Leopardus pardalis</i> (Linnaeus, 1758)*	Ocelot	10 (0.002)	5 (0.003)	11 (0.003)	4 (0.003)	30	VU	LC
<i>Leopardus wiedii</i> (Schinz, 1821)	Margay	1 (0.0002)	0 (0)	0 (0)	0 (0)	1	EN	NT
<i>Puma concolor</i> (Linnaeus, 1771)*	Puma	9 (0.001)	3 (0.002)	0 (0)	3 (0.002)	15	VU	LC
PERISSODACTYLA								
Equidae								
<i>Equus caballus</i> (Linnaeus, 1758)	Domestic horse	3 (0.0006)	5 (0.003)	0 (0)	0 (0)	8		Exotic
<i>Sus scrofa</i> (Linnaeus, 1758)*	Wild boar	1 (0.0002)	0 (0)	14 (0.003)	36 (0.032)	51		Exotic
Bovidae								
<i>Bos taurus</i> (Linnaeus, 1758)	Domestic cattle	0 (0)	0 (0)	0 (0)	39 (0.035)	39		Exotic

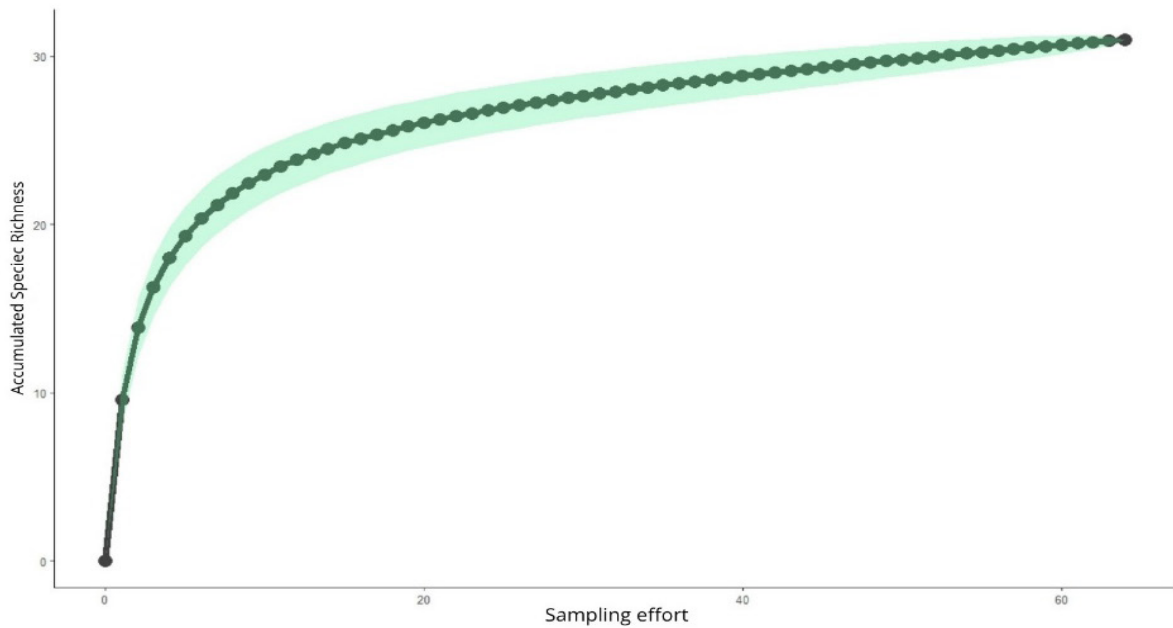


Figure 3. Accumulation curve of observed species of medium to large mammals recorded at Furnas do Bom Jesus State Park, in the municipality of Pedregulho, state of São Paulo, Brazil, as a function of the number of samples. The central line shows the accumulated number of recorded species, and the shaded area indicates the confidence interval.

cattle and European hare (*Lepus europaeus*). Most species that had been recorded in 2011, 2013 and 2017 were recorded again, reaching 31 species in the cumulative curve (Table 2).

DISCUSSION

The medium and large-sized mammal fauna of the PEFBJ includes rare and threatened species, such as the giant anteater, the jaguarundi (*Herpailurus yagouaroundi*), the puma, the maned wolf, the hoary fox, and the neotropical otter. The presence of these species reinforces the importance of the park for mammals' conservation, highlighting its essential role in the protection of threatened wildlife. Due to its floristic composition and geomorphological structure (Branco et al. 1991), PEFBJ serves as a refuge for forest dwelling species and conserves one of the few remnants of the Cerrado in the state of São Paulo.

During a survey conducted by the Fundação Florestal (2022), it was recorded 23 species in the park, including 21 native and two exotic species (i.e., wild boar and domestic dog). Our study recorded 31 mammal species, eight more than the previous

inventory did, but the Jackknife-1 estimator suggested an expected richness of 39 species. The species accumulation curve did not stabilize, indicating that additional sampling could reveal more species, which is consistent with the higher richness estimated by the Jackknife-1 estimator. The potential increase of eight new species in the species richness estimate can be primarily attributed to the presence of rare or species with low-detection rates that have not yet been recorded in the study area.

Despite its relatively small area, the PEFBJ presents greater species richness than other protected areas in São Paulo. At the Jataí Ecological Station (9,013 ha) and the Luiz Antônio Experimental Station (2,009 ha), 27 species within these parks and 31 species in total, including adjacent areas, were recorded under an effort of 105 sampling points using 3,150 camera-trap days, direct observations, footprint registers, and vocalizations (Paolino et al. 2016). The sample included exotic species, such as domestic dogs, cats, hares, cattle, and wild boars (Paolino et al. 2016). In five fragments in the Augusto Ruschi Biological Reserve (757 ha), 17 species were recorded, including domestic dogs, with an effort of 562 camera trap days, along with direct

observations and footprint registers (Fornitano et al. 2015). The higher species richness in PEFBJ may be attributed to its prolonged sampling period (2011–2022) and the fact that, unlike the other parks mentioned, it is in an ecotone region. However, it is worth noting that the monitoring was carried out exclusively using camera traps, and the use of complementary methodologies, such as direct observations and fecal analyses, can provide the record of new species at the park. Furthermore, arboreal species are usually not recorded in camera-traps at the ground level.

The presence of large mammals (e.g., maned wolf and giant anteater), including the large predators (e.g., puma), is important since these species generally require large areas to sustain viable populations (Rodrigues 2008). The presence of these species can contribute to maintaining a balanced ecosystem, mitigating cascading effects that impact the entire ecological community and influencing interspecific interactions, plant populations, and ecosystem processes, such as nutrient cycling (Magioli et al. 2021). The implementation of conservation actions targeting carnivores can prevent losses of other threatened species, given the essential role these predators play in maintaining ecosystem balance (Di Minin et al. 2016). Priority areas for carnivore conservation often overlap with habitats of other endangered species, benefiting not only rare and elusive small carnivores but also species from other taxa, such as amphibians (Di Minin et al. 2016).

The great species richness recorded in the PEFBJ may also be facilitated by fragments of native vegetation and larger protected areas in its surroundings, such as the Serra da Canastra National Park (Gomes et al. 2018). These areas may act as connections between forest fragments, allowing species dispersal and the colonization of new habitats, thereby reinforcing a source-sink dynamic within the landscape (Gomes et al. 2018). Recent records of the collared peccary (Silva et al. 2025), as well as the recolonization of the bare faced curassow *Crax fasciolata* (Spix, 1825; Galliformes, Cracidae), a bird species previously considered locally extinct (Gomes et al. 2018), provide evidence of PEFBJ's potential as a refuge and biodiversity stronghold.

The PEFBJ faces several threats, such as habitat fragmentation, deforestation, and the presence of

exotic species (Klink & Machado 2005, Durigan et al. 2007). Brazil's protected areas are critically underfunded, with more than 76% lacking adequate financial resources, which impairs effective conservation efforts (Silva et al. 2021). This scenario is particularly concerning for the Cerrado, where intensified land conversion for agriculture threatens biodiversity (Ferreira et al. 2020). One of the most urgent threats to PEFBJ is the presence of exotic species, especially wild boars, free-roaming dogs, and livestock. The presence of these species can impose ecological risks to the native species, acting as stressors and affecting their behavior, activity patterns, detectability, and spatial use (Lessa et al. 2016, Doherty et al. 2017, Di Bitetti et al. 2020, Bianchi et al. 2021, Tavares et al. 2024). Livestock can contribute to habitat degradation through grazing and soil trampling, reducing vegetation quantity and complexity (Di Bitetti et al. 2020, Tavares et al. 2024). Domestic dogs can negatively impact native carnivore populations, indicating potential defaunation processes in agricultural landscapes, as observed in biodiversity hotspots in Chile (Gálvez et al. 2021). Moreover, wild boars can act as hosts and reservoirs for several zoonotic diseases, including rabies, which is one of the world's most lethal diseases, and represents an important threat to the conservation of Brazil's native species biodiversity (Kmetiuk et al. 2023).

Considering the growing threats posed by exotic species, protected areas should implement a One Health approach to manage domestic and exotic animals. This approach should encompass planning, assessment, monitoring, control, and preventive measures (Kmetiuk et al. 2023). The control and management of wild boars, dogs, and livestock, combined with a One Health approach, could enhance biodiversity resilience, and protect the ecological integrity of the park's ecosystems. In addition, protected areas are essential for maintaining ecosystem connectivity, providing key services, and protecting threatened species (Watson et al. 2014). The role of protected areas becomes even more critical for safeguarding biodiversity and ecosystem functionality in agricultural regions in the highly threatened Cerrado biome.

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