

# A predation event by free-ranging dogs on the lowland tapir in the Brazilian Atlantic Forest

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## Abstract

*A predation event by free-ranging dogs on the lowland tapir in the Brazilian Atlantic Forest.* Dogs are associated with humans and human-dominated landscapes, and when they become feral and free-roaming, they can negatively impact wildlife through processes such as predation. In this study, we report a predation event of free-ranging dogs on lowland tapirs in a protected area (PA) of the Brazilian Atlantic Forest. As tapirs can be vulnerable to dog attacks, especially in a protected area surrounded by farming activities, research programmes and monitoring of these areas are crucial to understand the impact of free-ranging domestic species on wildlife. Additionally, education programs and dog control should be incorporated into conservation plans in such areas around PAs.

Key words: Conservation, Tropical forest, Alien species, *Canis familiaris*, Predation, Protected area, *Tapirus terrestris*

## Resumen

*Un evento de depredación del tapir por perros criados en libertad en parches forestales de mata atlántica de Brasil.* Los perros se relacionan con los humanos y los paisajes dominados por humanos, y cuando se asilvestran y crían en libertad, pueden incidir negativamente en la fauna silvestre mediante procesos como la depredación. En el presente estudio, describimos un evento de depredación del tapir por perros criados en libertad en una zona protegida (PA) de la mata atlántica del Brasil. El tapir puede ser vulnerable a los ataques de los perros, en especial en zonas protegidas rodeadas de actividades agrícolas, y es fundamental hacer un seguimiento de estas zonas y analizarlas para comprender los efectos de las especies domésticas criadas en libertad en la fauna silvestre. Además, deberían incorporarse programas de control y educación canina en las cercanías de las zonas protegidas a los planes de control de dichas zonas.

Palabras clave: Conservación, Bosque tropical, Especies exóticas, *Canis familiaris*, Depredación, Área protegida, *Tapirus terrestris*

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Introduction and/or invasion of exotic species is a major threat to biodiversity worldwide as a consequence of the increasing human population around, and even in, protected areas (Gompper, 2013; Roy et al., 2014). One species that has had a serious impact on biodiversity is the domestic dog (*Canis familiaris* Linnaeus, 1758),

the most abundant carnivore in the world (Young et al., 2011; Paschoal et al., 2016). Dogs are strongly linked to humans and human-dominated landscapes, in both rural and urban settings (Lacerda et al., 2009). Domestic dogs protect property and reduce human-wildlife conflicts by protecting livestock from people or

predators (Paschoal et al., 2016). However, when they are neglected or left without human care, dogs often become feral or free-roaming (Young et al., 2011), seriously affecting the wildlife (Gompper, 2013).

Interactions between domestic dogs and wildlife can be negative, especially in areas where dogs can roam freely throughout the landscape (Paschoal et al., 2016). Interactions between dogs and native species, for example, can result in competition (Lessa et al., 2016), as well as disease transmission and predation (Young et al., 2011; Lessa et al., 2016).

Predation on ungulates by domestic dogs has previously been reported elsewhere (e.g., Buuveibaatar et al., 2009; Lacerda et al., 2009; Young et al., 2011; Silva-Rodríguez and Sieving, 2012; Lessa et al., 2016). However, the extent of the problem is poorly reported in South America. In Brazil, for example, attacks on the lowland tapir *Tapirus terrestris* (Linnaeus, 1758) have been reported only for the Cerrado biome (Lacerda et al., 2009; Lessa et al., 2016). Here, we describe the first report of predation by domestic dogs on lowland tapir in a protected area of the Brazilian Atlantic Forest.

The lowland tapir represents an important functional group in the Neotropical region, because it feeds on a large variety of fruits and plant parts (Tobler et al., 2010), making them the largest surviving frugivores in tropical forests. However, the species is considered 'Vulnerable', both globally and in Brazil (Naveda et al., 2008; ICMBio, 2016), and is 'Endangered' in the Atlantic Forest (Medici et al., 2012). In the Atlantic Forest, the lowland tapir populations are distributed among very fragmented areas and threatened by high hunting pressure, traffic collisions, and rapid urbanization (Medici et al., 2012).

The Biological Reserve *Córrego do Veado* (BRCV) protects 2,342 ha of forest and is located in the municipality of Pinheiros, northwestern Espírito Santo (40° 8' W 18° 22' S), Brazil. The BRCV is a federal protected area (IUCN category Ia), without direct human interference, and dedicated to the preservation of biological diversity. The BRCV is the last remnant of forest in the region as natural vegetation has been largely replaced by agriculture and pasture. A variety of mammals remain in the protected area, however, such as anteaters (*Tamandua tetradactyla*), titi monkeys (*Callicebus personatus*), ocelots (*Leopardus pardalis*), deer (*Mazama* sp.), white-lipped peccary (*Tayassu pecari*), and lowland tapirs.

On June 20<sup>th</sup> 2012, during a fieldwork campaign in the BRCV, we found two lowland tapirs under attack by a pack of approximately five dogs. The attack occurred about 300 m east of the reserve headquarters at around 7:00 a.m. (local time; UTC/GMT-3 h). The volunteers from the fire brigade of the BRCV alerted our team to the attacks. One of the tapirs was an adult female and the other was a young female, approximately 18 months old (fig. 1). The adult female managed to escape, but when our team arrived, the young tapir (which was standing in a stream) was still being attacked by two dogs, only one of which was caught and removed by the BRCV employers. The young tapir had several superficial injuries on

its body, including head, limbs, and tail (fig. 1), and it was treated in situ by veterinarians. Soon after its recovery, the young tapir was released some 30 m into the forest from where we found it. About two hours passed from the moment we intervened in the attack until the young tapir was released.

Considering the presence of dogs in BRCV, we expect attacks on tapirs and other wildlife to become more common in this area for several reasons. First, the BRCV is a totally isolated forest fragment that is easily invaded. It is located within a landscape matrix of cattle pastures, crops (such as coffee, cassava and papaya), and eucalyptus and seringa (rubber) plantations (Flesher and Gatti, 2010). Second, it is surrounded by small and large farms from which dogs can likely roam freely. Third, the forest is frequented by poachers and their dogs (A. Gatti, pers. obs.). Fourth, the shape of the reserve and the type of the surrounding matrix increase its accessibility to people and domestic animals.

Lowland tapirs can be vulnerable to dog attacks as both species occur in a variety of habitats within landscapes (Lacerda et al., 2009), increasing their encounter rate, especially just beyond reserve edges. In these areas, lowland tapirs can take advantage of the heterogeneous landscape provided by the nearby matrix and disturbed areas, where they often feed in plantations and gardens (Lacerda et al., 2009). This is true for the BRCV, where farmers frequently complain about tapirs feeding on rubber trees and cassava plantations (Flesher and Gatti 2010; A. Gatti, pers. obs.). This situation prompts them to keep dogs to protect their livelihood, but increases the threats to the protected area. Also in these protected area edges, our team confirmed the recurring presence of lowland tapirs through direct observation and footprints on the dirt roads along the reserve and along the streams.

Assuming that lowland tapir population should have between 30 and 200 individuals to be demographically and genetically viable in areas of the Atlantic Forest, it has been suggested that, in the same way, viable populations would require habitat areas with at least 7,500 and 50,000 ha, respectively (Gatti et al., 2011). Because of the aforementioned problems, and considering the minimum population size, we expect that the lowland tapir population in the BRCV are neither demographically nor genetically viable in the long-term (the BRCV is an area of 2,382 ha), and that the presence of free-ranging dogs can act negatively in tandem with other types of impact (e.g., poaching) on the lowland tapir population, as well on the forest diversity (e.g., Gompper, 2013). Their local or functional extinction means loss of seed dispersal agents, especially for plant species that have large fruits and seeds (Bueno et al., 2013), and may also disrupt long-distance dispersal of many plant species (Giombini et al., 2016).

Furthermore, regardless of the degree of threat in a given protected area, the presence of dogs prompts the need for discussions on methods to mitigate their negative impact, many of which are controversial. For example, Zapata-Ríos and Branch (2016) suggested



Fig. 1. A young individual of *Tapirus terrestris* with injuries after being attacked by a pack of dogs in the Biological Reserve of Córrego do Veado, southeastern Brazil.

*Fig. 1. Individuo joven de Tapirus terrestris con lesiones después de ser atacado por una jauría de perros en la Reserva Biológica de Córrego do Veado, sureste de Brasil*

that robust populations of the mountain tapir *Tapirus pinchaque* and other native species in Cayambe–Coca National Park in the northern Ecuadorian Andes, may persist in the long–term, but only through control and eradication of domestic dogs. However, such actions are in generally expensive, rarely effective and non–viable in the long–term (Gompper, 2013).

Given the above, we recommend law enforcement to control the presence of dogs in protected and surrounding areas and its deep consideration by managers and stakeholders. For example, there is currently no mention of management or actions to control dogs in the BRCV management plan, other than the acknowledgement that "[...] the susceptibility to invasions by domestic animals, such as cattle and dogs from neighboring farms, are [...] weaknesses with a high degree of intensity [...]" (Ministério do Meio Ambiente, 2000; *encarte* 6, p. 5).

We also suggest that studies aimed at estimating the density of dogs in the BRCV and other protected areas of the region be performed to identify the potential effects of free–ranging dogs on the abundance and behavior of native mammals, including the lowland tapir. Additionally, management plans for protected areas and wildlife key conservation actions should include specific measures to minimize dog incidence in protected areas. Furthermore, for managers, we recommend special efforts be made to inform and educate the population living in surrounding protected areas about this problem, particularly the dog owners. Likewise, engaging local people to participate in con-

servation actions should be encouraged. Paschoal et al. (2012) emphasized that, in this particular case, community involvement needs to be mandatory. Understanding how the existing conflict occurs is one way to reduce the pressure on the remaining populations of lowland tapir in different ecoregions, especially in the Atlantic Forest.

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