

Context-dependent anti-predator behavioral responses of the lowland tapir (*Tapirus terrestris*) to free-ranging domestic dogs: evidence from opportunistic visual records

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Abstract

Anti-predator responses during pursuit can vary with predator number, proximity, habitat, and access to refuge, but direct observations involving large tropical herbivores are uncommon. We describe the behavioral responses of the lowland tapir (*Tapirus terrestris*) to free-ranging domestic dogs using two discontinuous video segments from a focal event in Brasília National Park, Brazil, an independent photographic sequence obtained at the same pond on a different occasion, and ten complementary videos uploaded to YouTube between 2016 and 2025. During the focal event, the tapir entered the pond and continued swimming while several dogs entered the water and swam in its direction. The recording ended before the tapir left the water or the final outcome was visible. The independent photographic sequence showed dogs pursuing a tapir in the pond and the animal subsequently leaving the water with a visible lateral wound, although the images did not establish the origin of the wound. Among the ten complementary videos, aquatic use was visible in seven, whereas three showed flight toward dense vegetation. One video showed a tapir advancing toward a pursuing dog, and another showed a juvenile remaining briefly immobile after a prolonged pursuit. Because the records were opportunistic and varied in completeness, these observations describe the available material rather than the prevalence of responses in the population. Together, the records document a diverse anti-predator repertoire and show that dogs may continue pursuing tapirs after they enter the water.

Introduction

Free-ranging domestic dogs (*Canis lupus familiaris*) are widespread carnivores closely associated with human-dominated landscapes (Vanak and Gompfer 2010; Gompfer 2014). When they enter natural areas, including protected areas, they affect wildlife through predation, pursuit, harassment, competition, and disease transmission (Lacerda et al. 2009; Lessa et al. 2016; Doherty et al. 2017; Zamora-Nasca and Lambertucci 2022). Pursuits may involve single dogs or groups and may continue across terrestrial and aquatic environments, exposing prey to changing escape opportunities and levels of risk.

The lowland tapir (*Tapirus terrestris*), the largest extant terrestrial mammal in South America (Padilla and Dowler 1994), is classified as Vulnerable globally and in Brazil (Varela et al. 2019; Medici et al. 2023). Although tapirs are known to enter water when pursued (Koster and Noss 2014), documented encounters with domestic dogs range from pursuit to fatal attack (Gatti et al. 2018; Contreras-Moreno et al. 2024), making these interactions a conservation concern wherever dogs overlap with tapirs, including within protected areas. Because such events are brief, unpredictable, and difficult to observe, visual records that reveal the sequence of tapir responses remain scarce (Parsons et al. 2016; Gatti et al. 2018).

Digital recording technologies and online media provide access to rare behavioral interactions that may otherwise escape direct observation (Dylewski et al. 2017; Vardi et al. 2024). Here, we combine a focal video record from Brasília National Park with an independent photographic sequence obtained at the same locality on a different occasion and complementary videos from online sources to document dog-

tapir pursuits and examine the anti-predator responses visible across encounters and the immediate contexts in which they occurred.

Methods

Local video and photographic records

Park rangers opportunistically recorded two segments of the same pursuit involving a lowland tapir and free-ranging domestic dogs at Lagoa das Antas ("Tapirs' Lake"), Brasília National Park, Brazil, on 2 April 2026 at 16:57 (Fig. 1). The segments have a combined duration of approximately 51 s but are separated by an unrecorded interval of unknown duration. Neither the beginning nor the final outcome was captured, so we analyzed the segments as discontinuous portions of the event and did not estimate the total duration of the pursuit or any behavioral duration spanning the recording gap.

An independent photographic sequence obtained at the same pond on a different occasion documented another dog-tapir pursuit in the water and the tapir's subsequent exit from the pond. Additional photographs from the locality documented aquatic use and visible wounds on other occasions; no cause was assigned unless directly documented.

Online video search

We searched YouTube on 2 April 2026 using the terms "anta cachorro", "anta perseguida por cachorro", "anta atacada por cães", "tapir dog", "tapir chased by dogs", and "tapir attacked by dogs". Videos were retained when a lowland tapir and at least one free-ranging domestic dog were visible during the same interaction and the tapir's response could be classified. Ten videos uploaded between 28 April 2016 and 12 October 2025 met these criteria (Online Resource 3). Upload dates were not assumed to represent recording dates.

Behavioral characterization

All videos were reviewed repeatedly, with frame-by-frame examination of the focal segments when necessary. We recorded only directly observable actions, classified as aquatic use, flight toward dense vegetation, temporary immobility, or active advance toward a dog. Events in the focal segments were described chronologically without inferring transitions across the recording gap. Complementary videos were coded for these responses, number of visible dogs, environmental setting, human involvement, and visible outcome; categories were not mutually exclusive. The photographic sequence was interpreted only according to its visible order.

Because the records varied in duration, completeness, and image quality, we did not estimate behavioral durations, response rates, or population-level frequencies. The sample was necessarily self-selected, and individual identity, sex, age, and prior experience were generally unknown (Webster and Rutz 2020).

Results

The first segment of the video recorded in Brasília National Park (Online Resource 1) begins with a lowland tapir running from Cerrado vegetation toward the pond while dogs can be heard barking and are visible in pursuit. The tapir enters the water and continues swimming with its head at the surface. During the remainder of the segment, the position of the proboscis changes repeatedly relative to the water surface. At least one dog subsequently enters the pond and swims in the tapir's direction.

After the unrecorded interval, the second segment (Online Resource 2) shows the tapir continuing to swim toward the opposite margin, with five dogs visible in the water. Four dogs swim in the same general direction as the tapir, whereas a fifth remains behind and advances more slowly. The distance between the tapir and the nearest dogs increases during the recorded segment (Fig. 2). Park rangers can be heard discussing how they intend to remove the dogs after the tapir leaves the water. The recording ends while the tapir is still in the pond and approaching the opposite margin; neither its exit nor the intervention is shown.

Photographic records obtained at the same locality, on a different date from the focal video, provide additional context (Fig. 3). A sequence taken on that occasion shows a dog swimming in the pond while pursuing a tapir (Fig. 3a) and the tapir emerging from the water with a conspicuous fresh wound on the lateral region of its body (Fig. 3b); the available records do not establish how the wound occurred. A photograph from a different occasion shows a tapir with a healed lesion of undetermined origin (Fig. 3c). Because the animals were not marked, it was not possible to determine whether the photographs show the same individual. Other photographs from separate occasions show tapirs swimming calmly while partially submerged, with the proboscis above the water surface (Fig. 3d).

The ten complementary videos (V1-V10; Online Resource 3) showed interactions in wetlands, forest edges, pasturelands, and human-modified landscapes. Aquatic use was visible in seven records (V1, V3, V4, V7, V8, V9, and V10); in V7, the tapir also moved into marginal vegetation. Visible injuries were also present in V3 and V9, although their origin could not be established from the recordings. Three videos (V2, V5, and V6) showed tapirs fleeing toward dense vegetation and did not show water use within the recorded sequence. In V2, a juvenile remained briefly immobile after a prolonged pursuit by two dogs. One dog was temporarily restrained by a person, after which both dogs resumed pursuit and the tapir fled into the forest. In V8, a tapir in a small pond turned and advanced toward a single pursuing dog, which retreated. Human actions visible or audible in the videos ranged from encouraging pursuit (V5) to attempts to interrupt it (V1, V2, V6, V7, V9, and V10).

Discussion

The focal video from Brasília National Park, together with the independent photographic sequence and the complementary online videos, documents several visible responses by lowland tapirs pursued by free-ranging domestic dogs: entry into and continued movement through water, flight toward dense vegetation, temporary immobility, and active advance toward a dog. Aquatic use appeared in seven of

the ten complementary videos, but this proportion describes a selected set of recordings and should not be interpreted as the frequency of that response in the population.

The prominence of water use in the records is consistent with reports that tapirs enter aquatic environments when pursued (Koster and Noss 2014). The focal footage also shows that dogs may continue pursuit in water. However, because the recording ends before the tapir leaves the pond, it does not establish whether water use ended the pursuit or whether the dogs would have continued after reaching land. The increasing distance visible in the second segment indicates only that the tapir moved farther from the nearest dogs during the recorded interval.

During aquatic movement, tapirs frequently kept the head and proboscis at or above the surface. In the focal event, the proboscis changed position repeatedly while the tapir continued swimming. This posture may be associated with breathing, visual or olfactory monitoring, or several functions at once, but the recordings do not allow these alternatives to be distinguished. We therefore treat proboscis position as an observed feature of aquatic movement rather than evidence of a specific sensory function.

The complementary videos broaden this descriptive repertoire. Flight toward vegetation was visible in three records, while V8 showed a tapir advancing toward a dog in a confined aquatic setting. Comparable active reactions toward dogs have been reported in tapirs (Contreras-Moreno et al. 2024), and vigorous defense has also been described in encounters with hematophagous bats (Amit and Valverde-Zúñiga 2022). The juvenile's temporary immobility in V2 followed a prolonged pursuit, but the footage cannot determine whether it resulted from fatigue, freezing, or another process.

The fresh wound visible in the photographic record and wounds visible in some online records show that injured tapirs occur in the same observational context as dog pursuit, but the images do not establish the origin, severity, or consequences of each lesion. The healed lesion photographed on another occasion cannot be attributed to dogs. Nevertheless, documented dog attacks on tapirs demonstrate that pursuits can cause injury or death (Gatti et al. 2018; Cepeda-Duque et al. 2024), and persistent harassment may impose additional energetic or physiological costs (Hughes and Macdonald 2013; Doherty et al. 2017).

Taken together, the focal and complementary records provide direct visual evidence that lowland tapirs express a context-dependent anti-predator repertoire during pursuit by free-ranging domestic dogs (Palmer and Packer 2021). The documented responses ranged from aquatic refuge and flight toward dense vegetation to temporary immobility and active advance toward a pursuing dog, indicating behavioral flexibility in relation to the immediate opportunities and constraints of each encounter. The present records do not allow the separate effects of dog number, proximity, habitat structure, or individual condition to be tested. These records point to the need for systematic sampling, as outlined below.

Several limitations restrict inference. The focal event is incomplete and contains an unrecorded interval, while the online videos differ in duration, framing, and image quality. Online videos also favor

conspicuous or prolonged interactions with a recognizable outcome (Webster and Rutz 2020). Consequently, the observed counts cannot be extrapolated to response probabilities or population-level patterns.

Some online videos appear to show conduct that may be inconsistent with wildlife protection legislation. We used these records only as observational evidence of animal behavior and do not endorse the activities depicted. Their availability illustrates both the scientific value and the ethical limitations of online media as a source of behavioral data (Vardi et al. 2024).

These records demonstrate the value of opportunistic video for documenting behavioral responses that are difficult to observe directly. In the focal event, entry into water did not immediately end exposure to pursuit, indicating that aquatic habitats used by tapirs should be considered when monitoring dog incursions in protected areas. Systematic observations are needed to test how dog number, proximity, habitat structure, and access to water influence tapir responses.

Declarations

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Data availability

The focal video recordings analyzed in this study are available as Online Resources 1 and 2. The list of complementary online video records is provided in Online Resource 3. Additional photographic records are available from the corresponding author upon reasonable request.

Competing interests

The authors have no competing interests to declare that are relevant to the content of this article.

Ethics approval / Animal welfare

This study was based exclusively on opportunistic, non-invasive video and photographic records and involved no capture, handling, experimental exposure, or direct interaction with animals by the authors. Institutional animal ethics approval was therefore not required.

Author contributions

CRC, SCR, LD, VSB, AAZ and AH conceived the study, collected and compiled the data, analyzed and interpreted the results, and revised the manuscript. CRC and AH wrote the first draft of the manuscript. All authors read and approved the final manuscript.

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Figures



Photograph showcasing the Lagoa das Antas (Tapirs' Lake) in which the predation attempt occurred.



Geographic Coordinate System
Datum: SIRGAS 2000

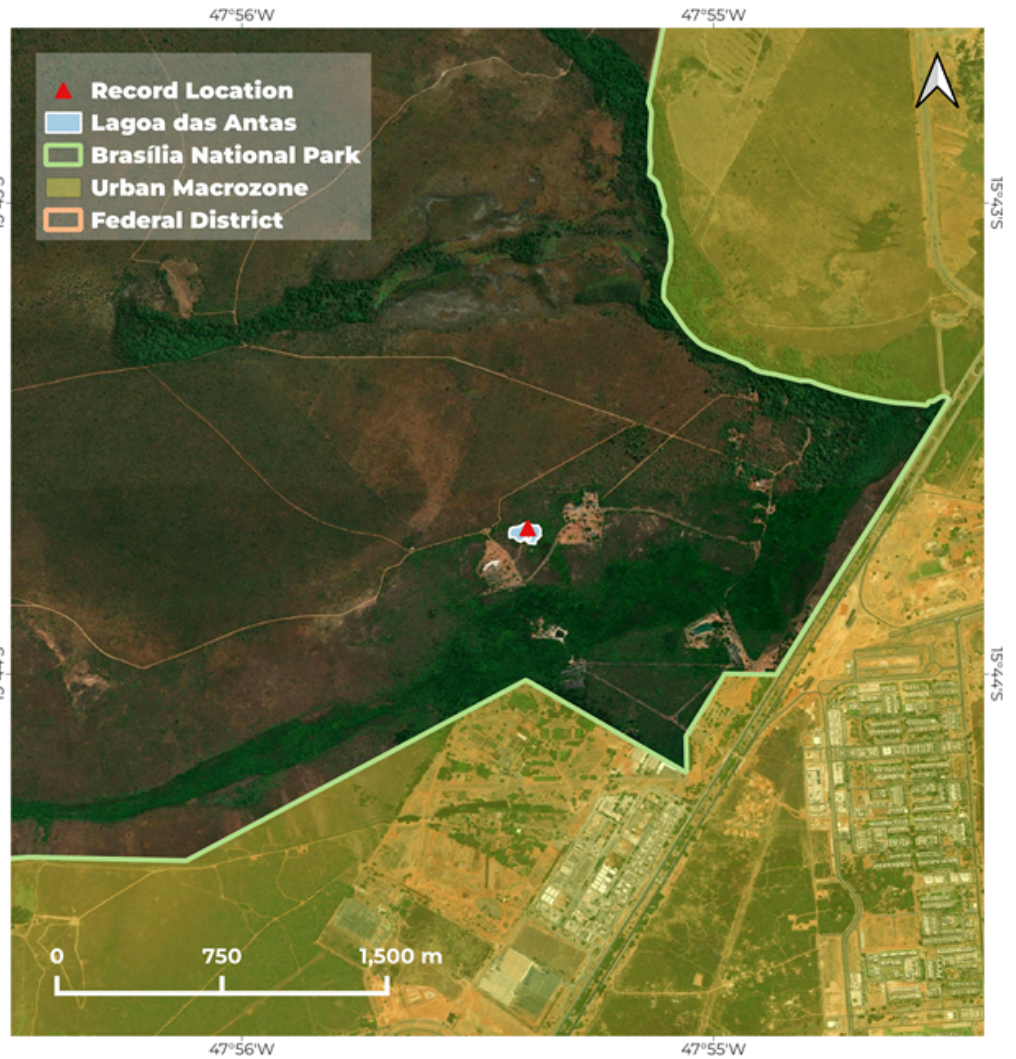


Figure 1

Location of Lagoa das Antas ("Tapirs' Lake") in the Ilha da Meditação area near the Visitors Centre of Brasília National Park, Federal District, Brazil



Figure 2

Composite prepared from frames of the two focal video segments recorded in Brasília National Park, Brazil. The frames show a lowland tapir swimming with its head and proboscis above the water surface and free-ranging domestic dogs swimming in the same pond. The images depict separate moments in the same pursuit and are not temporally continuous. Frames extracted from Online Resources 1 and 2. Composite by Davi Fernandes (Universidade Federal do Maranhão, UFMA)



Figure 3

Photographic records from Lagoa das Antas ("Tapirs' Lake"), near the Visitors Centre of Brasília National Park, Brazil. (a) Domestic dog swimming in the pond during a tapir pursuit. (b) Lowland tapir emerging from the water with a visible fresh wound on the lateral region of the body, photographed during the same sequence as (a) but on a separate occasion from the focal video; the origin of the wound was not documented. (c) Lowland tapir photographed on a separate occasion with a healed lesion of undetermined origin. (d) Tapir swimming calmly while partially submerged, with the proboscis above the water surface. Photos by Margi Moss

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [OnlineResource1.mp4](#)
- [OnlineResource2.mp4](#)
- [OnlineResource3.xlsx](#)