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Rare Camera Trap Detections Reveal Conservation Concerns for Brown Hyena (Parahyaena brunnea) in the Mid-Zambezi Valley Landscape, Zimbabwe

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Abstract

This study documents rare records of brown hyena (*Parahyaena brunnea*) in Zimbabwe's Mid-Zambezi Valley Landscape using camera traps and verified observations from 2015–2025. Despite extensive large carnivore surveys, only five photographic records were obtained, indicating extremely low density or transient occurrence. Notably, a 2025 record of a snared individual highlights significant conservation threats, particularly wire snaring. The sporadic detections suggest a small, possibly transboundary population across the unfenced landscape. These findings underscore critical knowledge gaps in distribution and population dynamics, and emphasize the urgent need for targeted research, strengthened anti-poaching efforts, and collaborative conservation strategies to ensure species persistence.

INTRODUCTION

Globally, large carnivores are declining due to habitat loss, human–wildlife conflict, road kills, bushmeat poaching and persecution (Loveridge et al., 2020; Mukomberanwa and Ngorima, 2025). In Africa, apex predators have lost substantial portions of their ranges: lions (Panthera leo) occupy only 18% of their historic range, while leopards (Panthera pardus) have disappeared from 37% (Ray et al., 2005; Trinkel & Angelici, 2015). African wild dogs (Lycaon pictus) persist in 56% of their former range, and brown hyenas (Parahyaena brunnea) number fewer than 10,000 mature individuals (Ripple et al., 2014; Gush et al., 2022). Their distribution is now largely restricted to parts of sub-Saharan Africa, including Zimbabwe, Botswana, Namibia and South Africa (Rich et al., 2017; Vissia, 2023; de Zeeuw et al., 2024).

Despite this, the brown hyena remains poorly studied, with limited information on its distribution and ecology, particularly in Zimbabwe (Strampelli et al., 2022; Alquinta et al., 2026). Existing studies are site-specific, leaving broader population dynamics unclear (Winterbach et al., 2017). In Zimbabwe, evidence ranges from incidental detections in Mangwe (Welch et al., 2015) to higher estimates in Bubye Valley Conservancy (Gush et al., 2022). In the Mid-Zambezi Valley, including Rifa and Mana Pools, records are sparse, suggesting low densities or transient individuals and highlighting the need for targeted research.

MATERIALS AND METHODS

STUDY AREA

The records were collected in the Mid-Zambezi Valley Landscape, northern Zimbabwe, which spans 12,150 km² and borders Zambia, Mozambique, and the Zambezi River (Fig. 1). The landscape consists of multiple administrative stations with varying land-use practices but no physical barriers, ensuring free wildlife movement across a unified ecosystem (Ngorima et al., 2022).

DATA COLLECTION

The study combined camera trap surveys and operator reports within the Mid-Zambezi Valley Landscape to document brown hyena records, excluding unverified sightings lacking photographic evidence or definitive proof. Systematic surveys began in 2015 conducted by Zimbabwe Parks and Wildlife Management Authority, commonly known as (ZimParks) and Wildlife Conservation Research Unit (WILDCRU) in Mana Pools, with follow-ups in 2018 and 2020 by ZimParks and Panthera, covering Mana Pools, Hurungwe, and Chewore Safari Areas. In 2024, the survey expanded to 12,150 km² of the Zambezi Valley Landscape, followed by a 2025 effort by ZimParks, Panthera, and the Middle-Zambezi Conservation Project focused on Hurungwe and Makuti.

RESULTS AND DISCUSSION

The 2015 large carnivore survey in the Mid-Zambezi Valley Landscape established a foundational protocol and baseline dataset for future studies. It notably captured the first camera trap image of a brown hyena in Mana Pools NP (Seymour-Smith & Loveridge, 2015). The species was identified using distinctive morphological characteristics. Subsequent surveys proved sporadic, including a 2018 camera trap survey conducted in Mana Pools, Hurungwe and Chewore Safari Areas which recorded two brown hyenas exclusively in Hurungwe (Fig. 2), producing the first high-resolution colour image of the species (Mann et al., 2018, Unpublished Report). However, a 2020 follow-up survey in Mana Pools and Hurungwe failed to detect evidence of the species, highlighting its elusive behaviour (Shumba et al., 2020, Unpublished Report).

The 2022 to 2023 large carnivore survey conducted by ZimParks and WildCRU, was the most extensive survey in the Zambezi Valley Landscape (Loveridge et al., 2024). While it successfully recorded lions, spotted hyenas (*Crocuta crocruta*), African wild dogs and cheetahs (*Acinonyx jubatus*), no brown hyenas were detected. This highlighted the species' rarity and elusive nature in the landscape. In 2025, a camera trap in Rifa Conservation Area captured a significant but troubling discovery of a brown hyena with a wire snare embedded in its neck, causing severe tissue damage, swelling and an open wound (Fig. 3). The emaciated condition of the animal suggested both the physical impact of the snare and other environmental threats. This finding highlights urgent conservation challenges for brown hyenas in the Mid-Zambezi Valley, particularly the threat posed by snaring.

Brown hyenas have been sporadically sighted around the Rifa Conservation Area, with historical observations dating back to 16 April 2022 by Mr. Archenoul near the hot spring and Rifa Camp (pers. comm.). The latest confirmed sighting occurred on 20 August 2025 at 18:40 during a routine wildlife monitoring drive by Elspeth Baillie and was documented with a photographic record (pers. comm.). A timeline of brown hyena presence in the Mid-Zambezi Valley Landscape reveals their rarity, with just five brown hyena camera records in the past decade thus two in Rifa and three in Mana Pools. These sightings suggest a single transboundary population, owing to the open and unbounded nature of the landscape. However, concerns persist over low density and an unclear decline due to snaring risks, particularly the 2025 detection of a snared hyena in Rifa. Such incidents illustrate the vulnerability of this scavenger species. As such, the critical need for conservation is evident to reverse brown hyena threats

considering the nature of the Mid-Zambezi Valley landscape wherein the presence of snaring in one are impacts the entire transboundary population. Urgent conservation efforts, with collaboration among ZimParks, conservation partners and local communities is essential to conserve the brown hyena. An integrated management approach can transform these rare, sporadic and concerning sightings of the brown hyena into opportunities for adaptive management, ensuring the survival of this near-threatened species in the landscape.

Declarations

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Conflicts of Interest: The authors declare no conflicts of interest.

Ethics, Consent to Participate, and Consent to Publish declarations: This study was conducted in protected areas within the Mid-Zambezi Valley Landscape, including Mana Pools National Park and surrounding safari areas, under the authority and permission of the Zimbabwe Parks and Wildlife Management Authority. All camera trapping and field activities were carried out in accordance with institutional guidelines and approved access regulations.

Author Contributions

H.J.N. and P.N. conceptualized the study; H.J.N., P.N., T.Mu., T.Ma., and N.M. collected and curated the data; H.J.N. and P.N. wrote the main manuscript text; T.Ma. and N.M. prepared Figures 1–3; all authors reviewed and approved the final manuscript.

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Figures

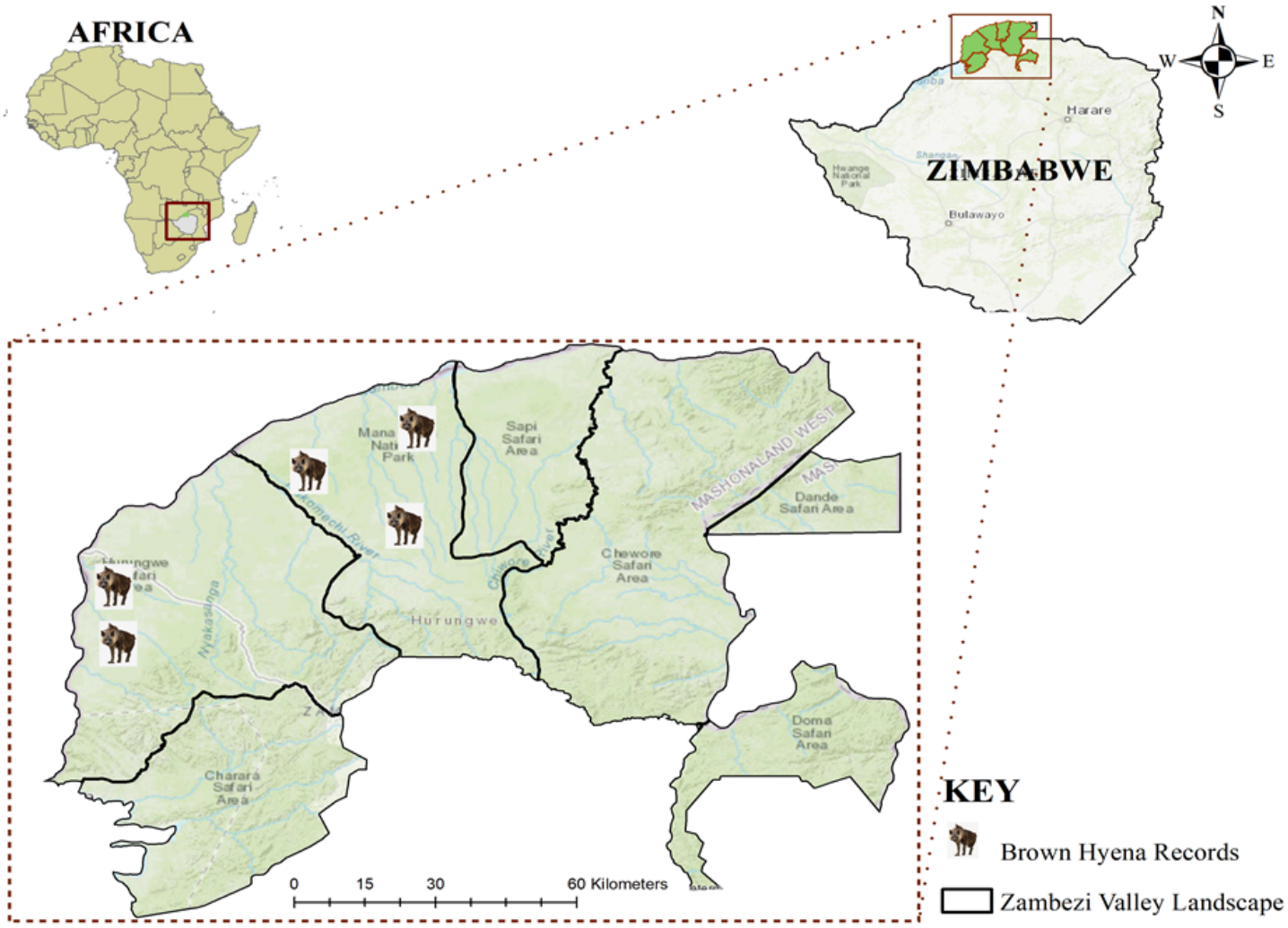


Figure 1

Map of Mid-Zambezi Valley Landscape showing all stations and the locations where brown hyenas were recorded



Figure 2

brown hyenas caught on camera during the 2018 camera trap survey in Hurungwe Safari Area



Figure 3

A brown hyena caught on camera during the 2025 camera trap survey in Rifa Conservation Area