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continued on the back inside cover

Cover: A male Scarlet Skimmer perching on vegetation by the banks of a waterbody. Ink and watercolour illustration by Anandita Pascal.

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Small Wild Cats Special Series

Sightings of the Rusty-spotted Cat *Prionailurus rubiginosus* (I. Geoffroy Saint-Hilaire, 1831) (Mammalia: Carnivora: Felidae) in Saurashtra Peninsula, Gujarat, India

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Abstract: We document 31 sightings of the Rusty-spotted Cat *Prionailurus rubiginosus* in the Asiatic Lion Landscape in Gujarat, India, in the period 2016–2024. Twenty-seven sightings occurred in Junagadh District, three in Amreli District and one in Gir Somnath District. Live individuals were observed in 21 incidents and dead ones in 10 incidents, including nine road kills. A total of 17 sightings (54.84%) occurred in revenue land, agricultural land and unclassified forest areas; 14 sightings (45.16%) occurred in protected areas, including seven in Gir Wildlife Sanctuary, six in Girnar Wildlife Sanctuary, and one in Paniya Wildlife Sanctuary. We observed Rusty-spotted Cats in trees on nine occasions. We discuss general distribution within Gujarat, and the negative impact of road networks being a threat to the species.

Keywords: Asiatic Lion Landscape, distribution, Gir, natural history, protected ares, roadkills, small wild cat, threats.

લેખ-ટૂંકસાર (=Gujarati Abstract): અભ્યાસ ના ૨૦૧૬ થી ૨૦૨૪ સમયગાળા માં, કુલ ૩૧ વખત કાટવર્ણી ટપકાંવાળી બિલાડી /નામ્રવર્ણી ટપકાંવાળી બિલાડી (*Prionailurus rubiginosus*) ના અવલોકન ગુજરાતમાં ગીર-સિંહ ના વ્યાપ વિસ્તાર માં થયેલ. જેમાં, ૨૭ વખત જુનાગઢ, ૩ વખત અમરેલી અને એક માત્ર ગીર-સોમનાથ જિલ્લામાં અવલોકન નોંધાયા. એમાંથી ૨૧ કિસ્સામાં જીવતી અને ૧૦ મોત પામેલી કાટવર્ણી ટપકાંવાળી બિલાડી /નામ્રવર્ણી ટપકાંવાળી બિલાડીના અવલોકન થયેલ , જેમાં થી નવ કિસ્સામાં તે રસ્તા ઉપર અકસ્માતમાં મોત થયેલી મળેલી . આ બાબતે ૧૭ (૫૪.૮૪%) અવલોકન રેવન્યુ, ખેતીવાડી, અને અન્ય જંગલ વિસ્તારમાં, અને ૧૪ (૪૫.૧૬%) જેટલા અવલોકન પ્રતિબંધિત જંગલ વિસ્તારના છે, જેમાં થી સાત ગીરમાં, છ ગિરનારમાં અને એક પાણિયા જંગલ વિસ્તાર માં નોંધાયેલ હતા. નવ કિસ્સામાં આ કાટવર્ણી ટપકાંવાળી બિલાડી /નામ્રવર્ણી ટપકાંવાળી બિલાડી વૃક્ષ ઉપર વિહરતી-ફરતી જોવા મળેલ. આ સંશોધન લેખ માં આ પ્રજાતિ નો વ્યાપ-વિસ્તાર, રોડ-રસ્તા ઉપરના મરણ બાબતના સંભવિત જોખમો અંગે વિગતે ચર્ચા કરેલ છે.

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Author contributions: Raju Vyas—design, development of concept, and manuscript writing. Pranav Vaghashiya—design, work-Coordination, field work. Devendra Chauhan—field work, Data analysis, manuscript writing

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INTRODUCTION

The Rusty-spotted Cat *Prionailurus rubiginosus* is distributed from the western Terai in India and Nepal to southern India and Sri Lanka (Mukherjee et al. 2016). In India, it is afforded the highest legal protection status under Schedule I of the Wildlife Protection Act (1972) (Ministry of Law and Justice 2022). Globally, it is categorised as 'Near Threatened' on the IUCN Red List (Mukherjee et al. 2016).

In India, the Rusty-spotted Cat occurs in the states of Jammu & Kashmir, Uttarakhand, Uttar Pradesh, Rajasthan, Gujarat, Madhya Pradesh, Maharashtra, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, and Odisha (Mukherjee et al. 2016). It has also been recorded in protected areas of Haryana, Chhattisgarh, Telangana, Bihar, and Punjab (Ghaskadbi et al. 2016; Basak et al. 2018; Kanwar & Lomis 2020; Jhala et al. 2021). Records in tiger reserves indicate that it is associated with mixed deciduous forests in low-lying and dry habitats (Habib et al. 2025). Observations by researchers and camera trap records also revealed its presence outside protected areas and in diverse habitats (Manchi et al. 2024; Mukherjee & Nandini 2024; Pawar et al. 2024).

In Gujarat, the Rusty-spotted Cat has been recorded in the arid landscape of Kutch (Mukherjee & Nandini 2024). Sightings have been reported in the dry deciduous forests of central and northern Gujarat and in the moist deciduous forests of Dang District (Digveerendrasinh 1987; Singh 2013; Patel et al. 2024). Since 1986, it has been sighted in Vansda National Park, Purna Wildlife Sanctuary, Shoolpaneshwar Wildlife Sanctuary, Jambughoda Wildlife Sanctuary, Ratanmahal Wildlife Sanctuary, Gir National Park and Wildlife Sanctuary (Digveerendrasinh 1987; Pathak 1990; Chavan et al. 1991; Patel 2006; Vyas & Upadhyay 2014; Vyas et al. 2018; Chaudhary et al. 2022; Patel et al. 2024).

We report sighting records of the Rusty-spotted Cat in the Saurashtra Peninsula between January 2016 and December 2024, along with information on habitat, predation, threats, and natural history.

Study Area

Our study area was located in the districts of Junagadh, Amreli, and Gir Somnath in the Saurashtra Peninsula of southwestern Gujarat (Figure 1). These three districts are part of the Asiatic Lion Landscape (ALL), which encompasses five protected areas, several protected, reserved and unclassed forests, scrublands, grasslands, croplands, and settlements (Ram et al. 2023). The five protected areas within the ALL are Gir National Park, Gir Wildlife Sanctuary, Paniya Wildlife Sanctuary, Mitiyala Wildlife Sanctuary, and Girnar Wildlife Sanctuary (Ram et al. 2023). The main forest type in the Saurashtra Peninsula is dry deciduous thorn forest (Rodgers & Panwar 1988). As of 2016, the forested area in Saurashtra and Kutch totalled 10,822 km^2, equivalent to about 5.5% of Gujarat, whereas 41,370 km^2 (21.1%) was under agriculture (Dehingia & Surendra 2020).

Apart from the Rusty-spotted Cat, the Lion *Panthera leo*, Leopard *P. pardus* and Jungle Cat *Felis chaus* also occur in the ALL (Ram et al. 2023).

The Saurashtra Peninsula experiences a temperature range of 8–42 °C; it receives 100–865 mm of rain during the rainy season from June to September (Parmar et al. 2025).

MATERIAL AND METHODS

We initially designed 1.5 km long stretches with five transects in Gir and Girnar Wildlife Sanctuaries within a zone that we considered to represent potential habitat of the Rusty-spotted Cat. During the first three months, all transects were surveyed once a week in the mornings (0530–0630 h) and again in the late evenings (1800–2000 h). However, we did not encounter any cats during these walks. Therefore, we conducted random visits to potential habitat areas. The current results are based on opportunistic sightings during irregular visits and excursions in and around the study area.

Behavioural observations were conducted using Nikon Monarch 8 x 42 and Nature Trek 12 x 50 binoculars. Photographs were taken with Sony Point Shoot, Canon EOS 7d and Sony Alpha a7III digital cameras. The latter two models were equipped with a 100–400 mm Canon and a Sony 200–600 mm camera lens, respectively. Coordinates were recorded using Garmin e-Trex 10 and E-Trex 20 GPS devices set to WGS 84. For each sighting, we collected information on habitat type, activity, and time of sighting.

In addition to our own sightings, we gathered photographic records and associated relevant information from forest department staff, nature club volunteers, wildlife observers and photographers. We revisited the locations of these secondary sightings and determined their coordinates using the mobile phone application GPS Coord Camera.

All data were compiled in Microsoft Excel 2011 and analysed to determine spatial-temporal patterns of sightings, roadkill incidents and preparation of maps. Simple statistical analyses were performed to calculate averages and percentages of sightings.

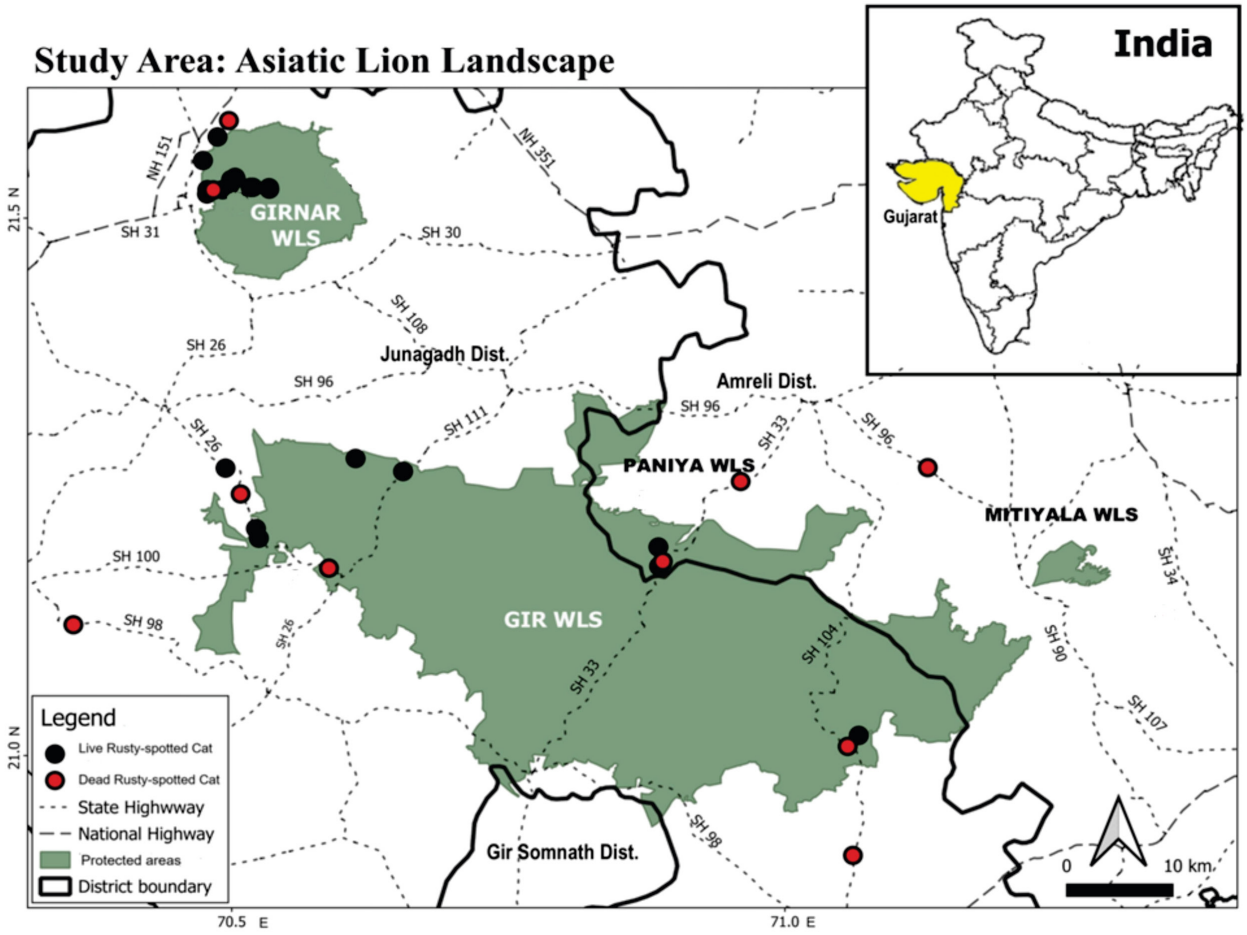

Figure 1. Map of the study area in Saurashtra Peninsula, Gujarat.

RESULTS

We collated 31 sightings of the Rusty-spotted Cat made from January 2016 to December 2024 (Table 1; Figure 1). Sightings ranged from one each in 2017 and 2019 to seven (22.58%) in 2023, with an average of 3.4 sightings per year (Figure 2). These include 13 sightings by the authors and 18 by secondary sources. Sightings encompass 27 (87.1% of all) in Junagadh District, three (9.68%) in Amreli District, and one (3.22%) in Gir Somnath District. Of these total sightings, 17 (54.84%) occurred outside protected areas (PAs), and 14 (45.16%) inside PAs, comprising seven in Gir Wildlife Sanctuary, six in Girnar Wildlife Sanctuary, and one in Paniya Wildlife Sanctuary.

Live individuals were observed in 21 incidents (67.75% of all sightings), including eight (38.10%) inside forests and 13 (61.90%) at the edges of forested areas and near settlements. Three sightings (14.29%) of live individuals occurred during the day, and 18 (85.71%) between dusk and dawn. Nine individuals were observed in trees that we identified as Manila Tamarind *Pithecellobium dulce* (Image 4A), Wild Almond *Sterculia foetida*, Teak *Tectona grandis*, Cluster Fig *Ficus racemosa,* and Oval-leaved Wheel Creeper *Combretum ovalifolium* (Image 4C).

Dead Rusty-spotted Cats were found in 10 incidents (32.26% of all sightings), including nine road kills, of which

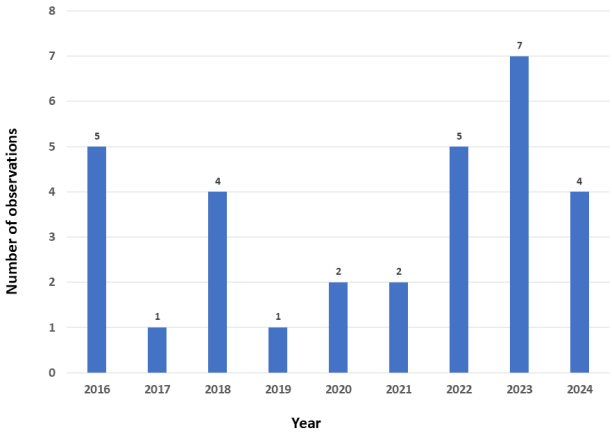

Figure 2. Graph showing the years of sightings of the Rusty-spotted Cat in Saurashtra Peninsula, Gujarat.

Table 1. Details of sightings of the Rusty-spotted Cat in the Asiatic Lion Landscape, Saurashtra Peninsula, Gujarat, India.

Date and time	Location	Coordinates	Habitat	Remarks	Observers
Live individuals in Gir Wildlife Sanctuary (WS)					
10.i.2016, 1812 h	Near Sapnes, Jamvada-Dhari Road	21.176° N, 70.886° E	On a tree at edge of scrubland	Image 1A	D. Chauhan, Amit Vaghashiya
29.i.2021, 0325 h	Near Vaniya Vav	21.211° N, 70.521° E	Teak forest	Image 1B	Urmil Jhaveri
16.i.2023, 0237 h	Near Chika Kuva Camp, Jasadhar	21.018° N, 71.066° E	On a tree in a cropland		K. Sharma, M. Sondarva
Live individuals in Girnar Wildlife Sanctuary					
3.iii.2016, 1830 h	Near 1000 Stairs	21.528° N, 70.517° E	Rocky scrub	Image 1C	Munir Jikani
9.viii.2016, 2200 h	Near Narayandhara	21.526° N, 70.491° E	Beside road	Image 2A	Ravi Patel
29.iii.2017, 0925 h	Girnar Top	21.527° N, 70.533° E	Rocky terrain	Image 2B	Kanbhai Jadav
16.xi.2022, 2328 h	Vagheswari Temple complex	21.522° N, 70.477° E	At forest edge		Vishvajitsinh Solanki
6.vi.2023, 0121 h	Girnar Top	21.528° N, 70.533° E	Rocky big boulders		Piyush Hirapara
Live individual in Paniya Wildlife Sanctuary					
7.iv.2024, 0113 h	Amreli	21.194° N, 70.885° E	Mixed dry deciduous forest	Image 2C	Rajdeep Jhala
Live individuals in non-protected areas and revenue land					
27.x.2018, 2300 h	Lal Dhori, Junagadh, edge of Girnar WS	21.537° N, 70.503° E	Near water body	Image 3A	P. Vaghashiya
15.v. 2019, 2357 h	Lal Dhori, Junagadh, edge of Girnar WS	21.536° N, 70.503° E	On a tree in a plantation		D. Chauhan, P. Vaghashiya
31.i.2020, 2304 h	Rupayatan, Junagadh, edge of Girnar WS	21.535° N, 70.499° E	On a tree in a forest	Image 3B	P. Vaghashiya
29.ix.2020, 0354 h	Ashok Shilalekh, Junagadh, edge of Girnar WS	21.525° N, 70.479° E	Outside a building at edge of scrub		Ankit Shukla
7.ii. 2021, 1730 h	Bamangaam Revenue, Junagadh	21.575° N, 70.487° E	In a bushland	Image 3C	Dipak Vadher
16.xi.2022, 2114 h	Anbabhagat-ni-Jagaya, Bhavnadh, Junagadh	21.531° N, 70.498° E	On a tree inside a settlement	Image 3D	D. Chauhan
11.ii.2023, 2034 h	Liliya-Haripura Road, Visavadar, Junagadh	21.276° N, 70.611° E	Near water body		D. Chauhan
16.xii.2023, 2345 h	Rupayatan Road, Junagadh, edge of Girnar WS	21.535° N, 70.499° E	On a tree		P. Vaghasiya
17.xii.2023, 0005 h	Khambha-Visavadar Road, Junagadh	21.264° N, 70.654° E	On a tree	Image 4A	D. Chauhan, A. Vaghashiya
4.i.2024, 1300 h	Dolatpura Revenue, Junagadh, edge of Girnar WS	21.553° N, 70.473° E	In a hedgerow at edge of a cropfield	Image 4B	Dipak Vadher
25.vi.2024, 2354 h	Lal Dhori, Junagadh, edge of Girnar WS	21.536° N, 70.503° E	On a creeper in a forest	Image 4C	D. Chauhan, P. Vaghashiya
2.ix.2024, 1955 h	Lal Dhori, Junagadh, edge of Girnar WS	21.536° N, 70.500° E	On a tree in a forest	Image 4D	P. Vaghashiya
Dead individuals					
23.xii.2016, 0945 h	Near Jasadhar Naka, Gir WS	21.008° N, 71.056° E	State highway	Image 5A	Bhavesh Trivedi
6.i.2018, 0622 h	Sasan Tourism Zone, Gir WS	21.121° N, 70.356° E	In a Lion's mouth	Image 5B	Indranil Ghosh
6.iii.2022, 1842 h	Sapnes-Dhakaniya Road, Gir WS	21.180° N, 70.889° E	Village road	Image 5C	D. Chauhan, B. Dudhatra
10.iv.2022, 0422 h	Near Sasan Town, Gir WS	21.174° N, 70.587° E	Village road	Image 6A	Parth Aghera
18.i.2023, 0537 h	Near Panjaka, Bhavnadh, Girnar WS	21.526° N, 70.483° E	Village road		Ajay Sonimar
6.viii.2016, 1100 h	Nobel College, Bhesan Road, Junagadh	21.590° N, 70.497° E	Village road	Image 6B	A. & P. Vaghashiya
11.viii.2018, 1711 h	Dhari-Khambha Road, Khambha, Amreli	21.267° N, 71.129° E	State highway	Image 6C	Gaurang Bagda
5.xi.2018, 0952 h	Malanka Road, Mendarda, Junagadh	21.243° N, 70.508° E	State highway		P. Vaghashiya
9.iii.2022, 2035 h	Dhari-Dhakaniya Road, Dhari, Amreli	21.2550° N, 70.960° E	State highway		Rajdeep Jhala
4.i.2023, 0924 h	Dhokadava-Una Road, Gir Gadhada, Gir Somnath	20.907° N, 71.061° E	State highway	Image 6D	Kaushal Sharma

Image 1. Rusty-spotted Cats: A—in Gir Wildlife Sanctuary, 10 January 2016 © D. Chauhan & Amit Vaghashiya | B—in a Teak forest, 29 January 2021 © Urmil Jhaveri | C—in Girnar Wildlife Sanctuary, 3 March 2016 © Munir Jikani.

Image 2. Rusty-spotted Cats: A—in Girnar Wildlife Sanctuary, 9 August 2016 © Ravi Patel | B—Two kittens, 29 March 2017 © Kanbhai Jadav | C—in Paniya Wildlife Sanctuary, 7 April 2024 © Rajdeep Jhala.

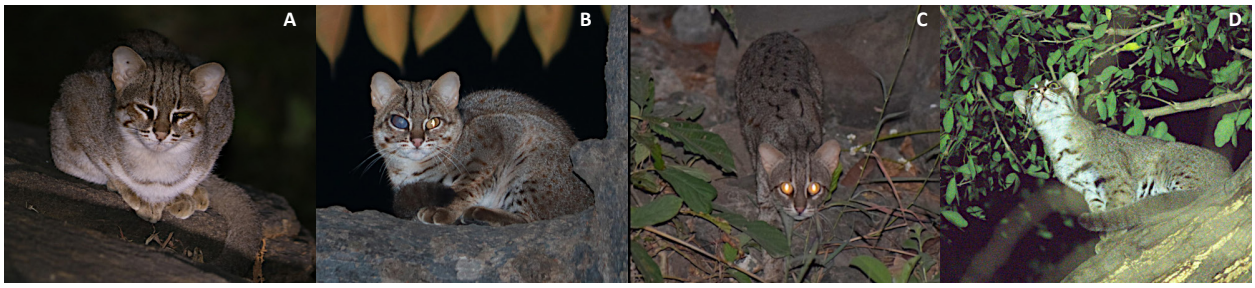

Image 3. Rusty-spotted Cats outside protected areas: A—near a water body, 27 September 2018 © Pranav Vaghashiya | B—near Rupayatan, 31 January 2020 © P. Vaghashiya | C—in a bushland, 7 February 2021 © Dipak Vadher | D—on a tree near a settlement, 16 Dec 2022 © D. Chauhan.

Image 4. Rusty-spotted Cats on trees: A—in a Manila Tamarind tree, 17 December 2023 © P. Vaghashiya | B—in wood stack, 4 January 2024 © Dipak Vadher | C—in Oval-leaved Wheel Creeper, 25 April 2024 © P. Vaghashiya |D—in a Manila Tamarind tree, 2 September 2024 © Pranav Vaghashiya.

Image 5. Dead Rusty-spotted Cats in Gir Wildlife Sanctuary: A—on a state highway, 23 December 2016 © Bhavesh Trivedi | B—in a Lion's mouth, 6 January 2018 © Indranil Ghosh | C—on a village road, 6 March 2022 © D. Chauhan.

Image 6. Rusty-spotted Cat roadkills outside protected areas: A—on a village road, 10 April 2022 © Parth Aghera | B—on a village road, 6 August 2016 © Amit Vaghasiya | C—on a state highway, 11 August 2018 © P. Vaghashiya | D—on a state highway, 4 January 2023 © Kaushal Sharma.

five occurred inside wildlife sanctuaries. Four road kills were found on village roads, and five on state highways. One dead individual was observed in the mouth of an adult Lion (Image 5B).

DISCUSSION

Our sightings document the presence of the Rusty-spotted Cat in Girnar, Paniya, and Gir Wildlife Sanctuaries and the adjacent unprotected forests. They also show that some individuals venture into plantations and crop fields adjacent to forest edges. Similar observations of Rusty-spotted Cats at forest edges have also been reported in other study areas (Patel & Jackson 2004; Patel 2006 2011; Vasava et al. 2012; Lele & Chunekar 2013; Mukherjee & Koparde 2014; Vyas & Upadhyay 2014; Sharma & Dhakad 2020; Roy & Makwana 2023).

The majority of live individuals were sighted after dusk, corroborating the nocturnal activity pattern of the Rusty-spotted Cat (Bora et al. 2020; Jhala et al. 2021).

The individual with the non-reflecting right eye sighted by night at the edge of Girnar Wildlife Sanctuary (Image 3B) resembles a similar case encountered in eastern Gujarat (Vyas & Upadhayay 2014). The Lion carrying a Rusty-spotted Cat in its mouth is an unusual incident, as the Lion typically preys on large ungulates (Ram et al. 2023).

Our roadkill records corroborate and underline that the road networks have a direct negative impact on the Rusty-spotted Cat's movement between forest patches (Tehsin 1994; Rao et al. 1999; Nayak et al. 2017; Sharma & Dhakad 2020; Patel et al. 2024; Pawar et al. 2024). The existing road and railway networks and recent developments of expanding this linear infrastructure in Gujarat are significant emerging threats to wildlife (Vyas et al. 2023). Roads and railway tracks cutting through natural habitats form barriers to wildlife movements and thus disrupt populations of many species (Rajvanshi et al. 2001; Forman et al. 2003; Benítez-López et al. 2010; Barrientos & Borda-de-Água 2017; Thatte et al. 2020; Vyas et al. 2023). Therefore, we recommend giving special attention to maintaining and improving habitat connectivity between forest patches that are vital for the Rusty-spotted Cat and other species reliant on forests.

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