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Cover: Mixed media illustration of a Blue bird and Sunbird. © Lakshmi Niranjana.



Small Wild Cats Special Series

Rusty-spotted Cat *Prionailurus rubiginosus* (I. Geoffroy Saint-Hilaire, 1831) (Mammalia: Carnivora: Felidae) in the semi-natural subterranean habitat in Karnataka, India

Shirish Manchi¹ , Goldin Quadros² , Dipika Bajpai³, Shomita Mukherjee⁴ , Suma Haleholi⁵,
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On 29 March 2023, we conducted a rapid survey in three abandoned gold mines in Kappatagudda Wildlife Sanctuary in Gadag, Karnataka, India (Image 1) to explore the biological diversity in these artificial subterranean habitats. The habitat around these mines is characterised by dry grasslands interspersed with thorn scrub forests (Image 2). Due to the presence of groundwater, our survey of the mines was limited to the upper strata. While surveying one of the mines in Jalligeri village of Shirahatti taluka in Gadag district, we observed pug marks of a small mammal. Approximately 85 m from the tunnel's entrance, we found the carcass of a male Rusty-spotted Cat *Prionailurus rubiginosus* (Image 3).

The carcass was taken to Gadag Zoo for further examination (Image 4). The cat measured 68.58 cm in total length, 35.56 cm in body length, with a 10.16 cm head, 22.86 cm long tail, 22.86 cm in height, and chest girth of 35.56 cm, indicating that it was an adult. The gut contained a partly digested unidentified bat species

(Microchiroptera) (Image 5). The dissection examination of the carcass revealed exophthalmia of eyeballs, gelatinisation of subcutaneous fat, paleness and friable nature of kidneys, half-digested food, severe congestion in the right lobe of the lung, passed off rigour mortis, and initiation of the secondary flaccidity. We therefore estimated that the time of death was within 48–72 hours prior to the collection (Sastri 2020). The cause of death could not be determined.

Rusty-spotted Cat predation on bats is evident from at least one instance in Gujarat (Devkar et al. 2016). Other studies on Rusty-spotted Cat diet indicate that rodents form its primary prey (Mukherjee et al. 2016; Bora et al. 2020; Chaudhary et al. 2022; Mukherjee et al. 2024). This individual possibly visited this cave for hunting, as caves have a rich presence of bats and rodents (Busch et al. 2000). The Rusty-spotted Cat is claimed to also use caves and crevices in other parts of India (Patel 2011; Vyas & Upadhyay 2014).

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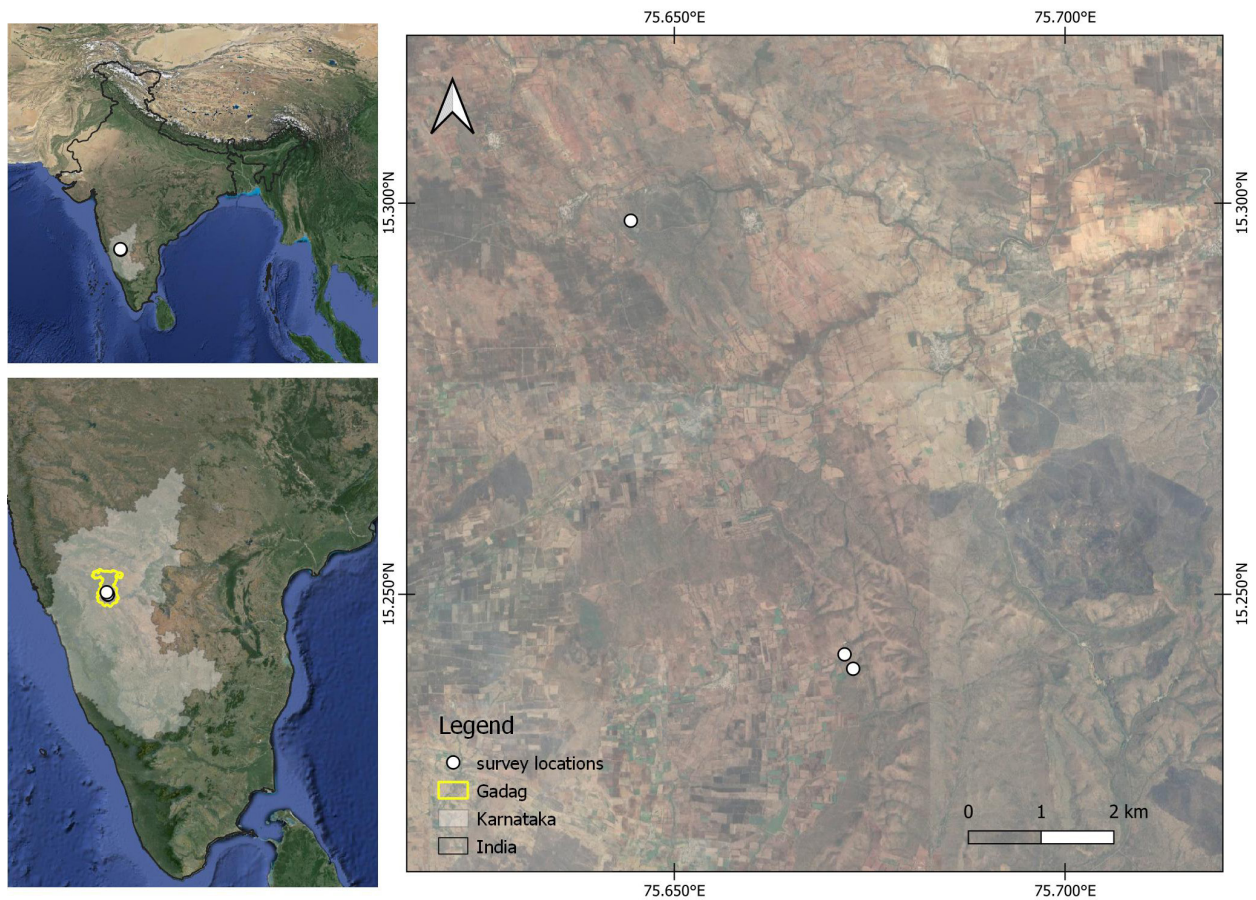


Image 1. Map showing the location of the surveyed human-made subterranean spaces in Kappatagudda Wildlife Sanctuary, Karnataka, India.



Image 2. The habitat around the abandoned gold mine. © Shirish Manchi.

Between 1900 and 1922, horizontal tunnels were dug in Indian forests for gold mining, but they have been abandoned since mining ceased in the early 1990s. The

mines have varying lengths and structures with several subterranean water patches. Due to infiltration from rainwater, these tunnels are inaccessible for most part



Image 3. The carcass of the Rusty-spotted Cat found in the abandoned gold mine, Kappatagudda Wildlife Sanctuary. © Shirish Manchi.



Image 4. Measuring the morphometric characteristics of the dead Rusty-spotted Cat found in the abandoned gold mine. © Shirish Manchi.



Image 5. A bat (Microchiroptera) was recovered from the gut of the carcass of the Rusty-spotted Cat. © Shirish Manchi.

of the year. Horizontal branching tunnels could only be reached via wet ground and shallow water ditches. The oligotrophic subterranean habitat harboured several amphibians, sustained mainly by organic matter from the bats inhabiting the roof and dropping their guano.

Our observations suggest that the subterranean habitats are possible additional important areas of use for the Rusty-spotted Cat, especially given the availability of prey such as bats. The Rusty-spotted Cat possibly contributes to the food chain of this semi-natural subterranean habitat, both as a top predator and as an additional energy source to this oligotrophic ecosystem. Further investigation on this aspect is necessary to uncover the extent of its contribution to this ecosystem.

Ecologically, subterranean habitats are still poorly understood (Wynne et al. 2021). They contain unique and specialised biozones of high scientific interest and conservation potential (Stone et al. 2005). Abandoned

mines are semi-natural habitats and complex ecosystems (Lenart et al. 2022).

The presence of a Rusty-spotted Cat, a Near Threatened (Mukherjee et al. 2016) and Schedule-I species (Ministry of Law and Justice 2022), in a human-made subterranean habitat demonstrates the high conservation value of this habitat and calls for additional research to explore underground ecosystems in the cat's range. We urge local, state and national governments and other stakeholders to safeguard and oversee both human-made and natural underground habitats in order to maintain and preserve these under-researched crucial habitats for a multitude of identified and unidentified species that rely on them.

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