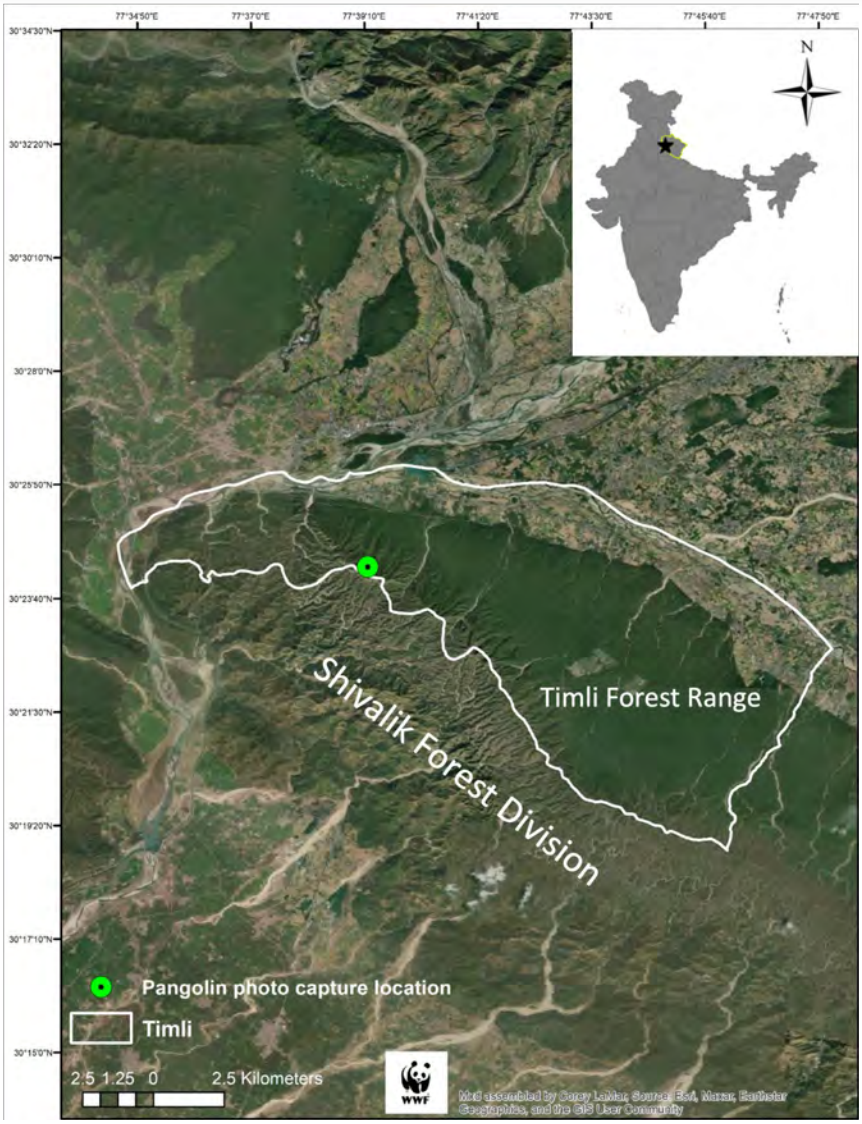
Photographic evidence of the Indian Pangolin in Timli Range, Soil Conservation Forest Division, Uttarakhand

India hosts two pangolin species: the Indian Pangolin *Manis crassicaudata*, classified as 'Endangered' on the IUCN Red List (Mahmood et al. 2019), and the Chinese Pangolin *Manis pentadactyla*, ranked as 'Critically Endangered' (Challender et al. 2019). The Indian Pangolin's known distribution spans southern Asia, excluding the Himalaya, from eastern Pakistan across much of the Indian subcontinent. The range of the Indian Pangolin extends throughout India from northern India (Roberts & Vielliard 1971) to certain regions of the northern Western Ghats and northern Eastern Ghats (Aditya et al. 2021). The species sighting has also been indicated in both coastal and mountainous forested areas of Odisha (Mishra & Panda 2012). With an altitude range of 0–2,000 m, it thrives in tropical, sub-tropical, dry-mixed evergreen, sub-mountain, and riverine forests (Roberts 1977). Adult Indian Pangolins weigh 8–16 kg and measure up to 148 cm, with their tail constituting around 39–54 % of their body length (Mahmood et al. 2019). Their specialized diet comprises insects, mainly ants and termites, which they capture with their adhesive tongues (Karawaita et al. 2020).

Camera trap image of the Indian Pangolin from Timli Forest Range, Uttarakhand. © WWF-India.

It faces threats across its range due to widespread hunting, poaching, and trade for its skin, scales, and meat (Mahmood et al. 2012; Perera & Karawita 2020). Its derivatives are highly sought after, making it the world's most trafficked wild animal (Shepherd 2009). In India alone, nearly 6,000 pangolins were poached between 2009 and 2017 (Challender 2020). Recognizing its rapid decline, the Indian Pangolin is listed under Schedule I of the Indian Wildlife (Protection) Act 1972, which prohibits hunting and emphasizes on conservation. It is also included in CITES Appendix I, banning



Location where the Indian Pangolin was photo captured in Timli Forest Range.

commercial international trade (CITES 2017). Despite these protections, illegal trade persists.

This report highlights the presence of the Indian Pangolin in the Shivalik Bhabhar tract in Western Uttarakhand, India. Limited studies have explored the pangolin's distribution, habitat use, and ecology in this area. Our findings suggest a potentially larger geographic range than previously understood, providing valuable evidence for the extent of Indian Pangolins in the region. This discovery points to a broader distribution than previously recognized and contributes significant evidence to the species' range in the area.

Study Area

Timli Range is found within the Soil Conservation Forest Division, Kalsi. It shares its boundary with Barkala Range of Shivalik Forest Division in the south, Malhan Range of the Dehradun Forest Division in the east and Kalesar National Park of Haryana in the west, which is connected to Timli Range via the Yamuna River. The terrain is undulating (elevation ranging 300–1,000 m) and has diverse habitats including sal forests (dominated by *Shorea robusta*), mixed forests (dominated by *Mallotus philippensis*), and Himalayan forests (characterized by *Pinus roxburghii*). There are steep hills, deep valleys, and several rocky streams (raus). While the northern part of Timli Range is hilly, comprising of steep slopes which characterise the typical Shivalik Range, the southern part of this range has extensive sal forest patches, which are regularly frequented by elephants. Being a junction of sorts, the area is exposed to over 200 species of birds and many invertebrate species (WWF India unpub.). This range also serves as a crucial wildlife corridor for tigers, elephants, leopards and other animals and facilitates their movement

Habitat of Timli Forest Range, Uttarakhand. © Devavrat Pawar.

between Rajaji Tiger Reserve, Uttarkahand, Shivalik Forest Division, Uttar Pradesh, to Kalesar National Park, Haryana & Simbalwara Wildlife Sanctuary, Himachal Pradesh.

To better understand the diversity and distribution of the mammalian fauna in the Timli Range of Soil Conservation Forest Division, Kalsi, a rigorous and continuous camera trap survey was conducted between February and March 2022. Around 150 camera traps were deployed for 25 days throughout the range, with pairs of cameras placed in each 2 km^2 grid cell to maximize coverage, providing comprehensive coverage of the study area.

The pangolin was photo captured at a single-camera trap location at 2300 h on 3 March 2022, at an elevation of 808 m. The terrain where the pangolin was photo captured, was rugged and undulating. The dominating vegetation cover at the location consisted of Sal *Shorea robusta*, Rhoini *Mallotus philippensis* and Kadu *Clerodendron*.

This record of the Indian Pangolin is the first documented evidence from the Soil

Conservation Forest Division, Kalsi. However, it isn't the initial record within the Shivalik-Bhabar region. Previous sightings exist in Rajaji Tiger Reserve, Uttarakhand (WWF-India unpub.). Additionally, Singh et al. (2023) recently photographed the Indian Pangolin in the neighbouring Colonel Sher Jung National Park in Himachal Pradesh. These findings emphasize the continuous presence of the Indian Pangolin in the Shivalik-Bhabar region, extending beyond protected areas. Advancements in camera trapping techniques have enhanced our understanding of these elusive, endangered species' distribution and presence. Due to limited studies (Mahmood et al. 2019), comprehensive data on the Indian pangolin remains scarce. In-depth research in their habitats is essential for grasping ecology, behaviour, and addressing threats like poaching, habitat fragmentation, and linear infrastructure (road accidents and obstruction to connectivity). Such insights are pivotal for designing effective interventions, and supporting survival across its range, including the Shivalik Hills. Given the unknown population size, continued research on the distribution and population dynamics of the Indian Pangolin is imperative. This knowledge will contribute to forming robust conservation strategies, ensuring survival beyond protected areas.

An Indian Pangolin road kill, near Rajaji Tiger Reserve. © I.P. Bopanna.

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