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continued on the back inside cover

Cover: A mesmerising Indian Luna moth *Actias selene* is dancing through the starry night (by Vincent van Gogh) moonlit sky, displaying its ballistic display of feather tail.  
Digital artwork by Vyshnavee Sneha Jaijar.





## INTRODUCTION

The Dhole *Cuon alpinus* (Pallas, 1811), also known as the Asiatic Wild Dog, is a social canid (Pocock 1936; Johnsingh 1982; Habib et al. 2021) and a communal hunter, occasionally forming packs of up to 30 individuals (Fox 1984). Depending on prey availability, they may also hunt alone or in pairs (Cohen et al. 1978; Venkataraman et al. 1995). The Dhole is listed as 'Endangered' on the IUCN Red List (Kamler et al. 2015) and as a Schedule I species under the Indian Wildlife (Protection) Act, 1972. Historically, the Dhole's distribution ranged from the Tian Shan and Altai mountains (in the Russian Federation), Mongolia, and Kazakhstan (Thenius 1954) southwards through China, Tibet, Nepal, India, and Indochina (Selvan et al. 2013). Currently, the Dhole's distribution is confined to central & eastern Asia, India, Nepal, Bhutan, Bangladesh, China, Myanmar, Indonesia, Thailand, and Malaysia (Johnsingh 1985; Kamler et al. 2015; Srivathsa et al. 2019; Kao et al. 2020). Understanding the distribution of Dhole is therefore crucial for guiding effective conservation strategies and ensuring the species' long-term persistence across its range.

Although Dholes have been extensively studied in India, much of the research has primarily focused on their feeding ecology, genetics, and demography (Cohen 1978; Johnsingh 1982, 1985, 1992; Venkataraman 1995; Karanth & Sunquist 2000; Acharya 2007; Borah et al. 2009; Pal et al. 2018; Ghaskadbi et al. 2022; Modi et al. 2021 & 2022). But studies in northeastern India remain relatively limited (Babu & Venkataraman 2001; Gopi et al. 2010, 2012; Lyngdoh et al. 2014). The Dhole has been recorded in northeastern states such as Arunachal Pradesh, Assam, Meghalaya, Mizoram, Nagaland, & Sikkim and in the eastern state of West Bengal (Choudhury 1998, 2006; Durbin et al. 2008; Bashir et al. 2014; Singh et al. 2020). In Nagaland, a pack of Dholes was observed by birdwatchers on 21 May 2011, far from the Myanmar border, and this sighting was confirmed by the Nagaland Forest Department (Conservation India 2011).

The distribution range of the species has reduced to less than 25% of its former global range due to threats such as retaliatory killing, habitat loss, and prey depletion (Wolf & Ripple 2017; Ghimirey et al. 2024). Previous global assessments in 1990 reported that Dhole presence was confined only to the northern bank of the Brahmaputra River and have undergone extirpation in the south (Ginsberg & Macdonald 1990; Singh et al. 2020). Recent records of Dholes from Dampa Tiger Reserve in Mizoram and other areas of northeastern

India, including non-protected regions, provide evidence of the species' persistence in the region (Singh et al. 2020). Here, the photographic record of the species in Kaziranga-Karbi Anglong landscape (KKAL), Assam, India is reported.

## STUDY AREA

The KKAL of Assam spreads over 25,000 km<sup>2</sup>, touching the neighbouring states of Meghalaya and Nagaland in northeastern India. The landscape is a complex mosaic of protected and non-protected areas. It comprises the Karbi plateau in Karbi Anglong, located on the southern side of the Brahmaputra River in Assam, with Kaziranga Tiger Reserve situated at the foothills of the Karbi Anglong District (Image 1). The landscape is severely fragmented with patches of protected areas that support globally threatened wildlife species. The landscape is connected with nearby protected areas such as Nameri Tiger Reserve (Assam) and Pakke Tiger Reserve (Arunachal Pradesh) to the northern side, Laokhowa Burhachapori Wildlife Sanctuary (Assam) to the western side, Nambor Wildlife Sanctuary (Assam), and Ntangi National Park (Nagaland) to the southern side through several corridors. Thus, understanding wildlife presence and corridor usage is important for better management of corridor functionality in the landscape. The four primary corridors connecting KKAL with the protected areas to the southern side are Panbari (92.20 km<sup>2</sup>), Haldibari (117.24 km<sup>2</sup>), Kanchanjuri (109.83 km<sup>2</sup>), and Amguri (49.83 km<sup>2</sup>).

## METHODS

A reconnaissance survey was conducted across these corridors, and based on the findings, camera traps were strategically deployed to monitor the mammalian species present. Camera traps were systematically placed along animal trails to maximize the chances of detecting wildlife species. A pair of camera traps was deployed within each 2 × 2 km<sup>2</sup> grid, ensuring at least one camera trap station in every grid. Infrared and White flash Cuddeback (H1453 IR and C1 model) camera traps were used during the study. A total of 83 camera traps were deployed across an area of 276 km<sup>2</sup> covering the four corridors of the KKAL. The study was conducted from February 2021 to December 2022, with continuous monitoring of animal movements, spanning a total of 15,278 camera-trap days. The primary aim of this study was to determine the structural and functional connectivity of wildlife corridors within the landscape.

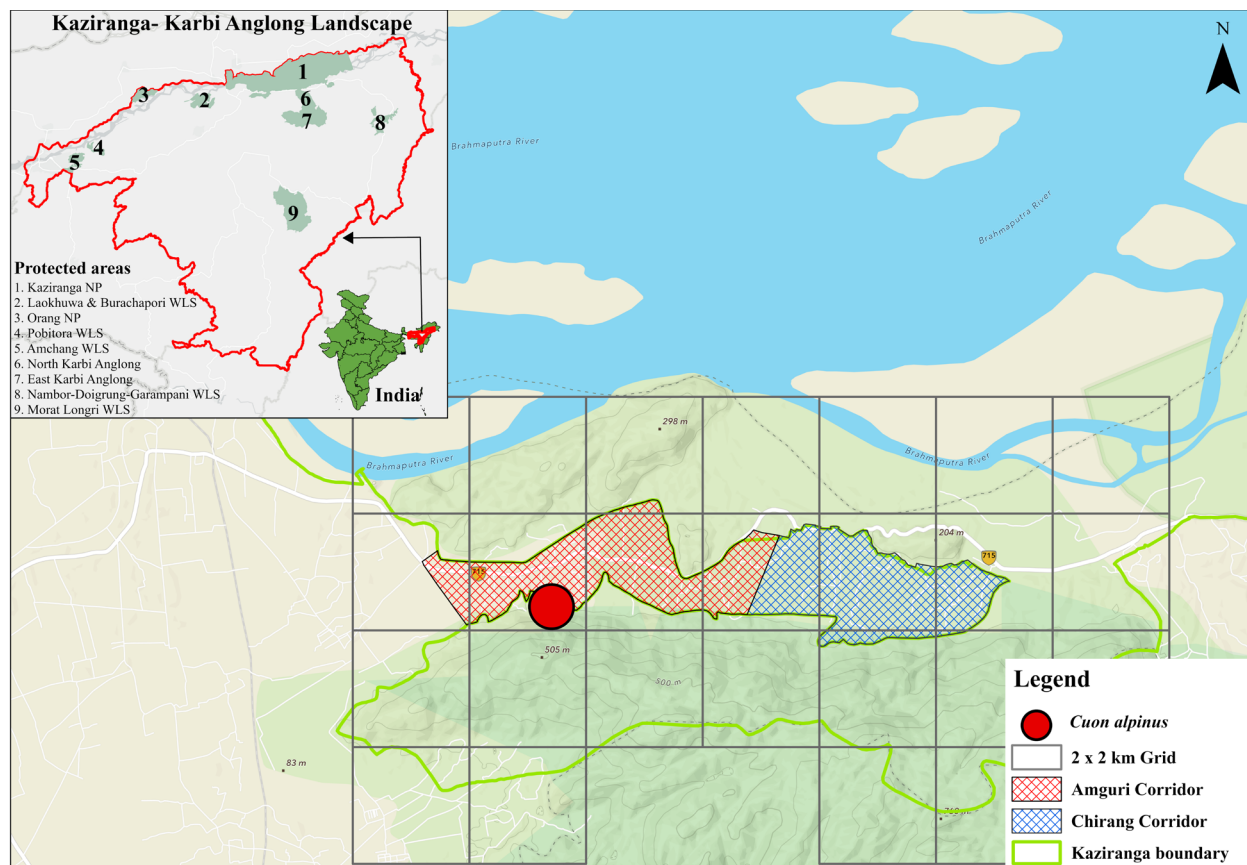


Image 1. Dhole *Cuon alpinus* occurrence in the Kaziranga-Karbi Anglong landscape, Assam, India.



Image 2. a—Heterogeneous and undulating terrain of the Karbi Anglong hills, characterized by mixed forest cover and anthropogenic clearings | b—Kalioni River flowing through a forested valley in Karbi Anglong, serving as a vital ecological corridor and freshwater source in the landscape.  
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Image 3. Camera trap images of Dholes captured in the Amguri Corridor, Kaziranga-Karbi Anglong landscape, Assam, India.

While the study focused on broader connectivity patterns for multiple species, it also sought to assess habitat use, and movement of mammals.

## RESULTS

A total of six photos were captured of a single individual, with the first capture time on 31 October 2022, at 11:55:05 AM. The individual returned through the same route at 11:56:37 AM, and the location (26.562° N, 93.04333° E) was within the Amguri Corridor (Image 3). This was the only instance where we captured a Dhole on camera in the landscape during the study period. The location of the photo-captured Dhole was approximately 375 m from the National Highway 37, with the nearest human settlement located at about 270 m. The habitat consists of moist mixed deciduous forest, dominated by teak *Tectona grandis* (Champion & Seth 1968).

## DISCUSSION

This study provides the first photo evidence of Dholes by camera traps in KKAL, confirming the species' occurrence in this region. The southern region of the Brahmaputra River serves as a critical habitat for Dholes, a species that was extirpated in the 1990s (Ginsberg & Macdonald 1990). Recent sightings have been documented in Mizoram, Meghalaya, Nagaland, and Assam (Singh et al. 2020). In Assam, evidence on Dhole occurrence is limited. The most reliable record

comes from Jeypore-Dihing Reserve Forest in Dibrugarh District, where Kashmira Kakati observed a Dhole in 2010, as described by Singh et al. (2020). Although secondary sources suggest occurrences in the Patharia Hills Reserve Forest, Karimganj district, these accounts lack reliability to confirm the species' presence (Talukdar & Choudhury 2017). The recent records of Dholes from Dampa Tiger Reserve in Mizoram and other areas of northeastern India, including non-protected regions, provide evidence of the species' persistence in the region (Singh et al. 2020). While the KKAL likely provides suitable habitat for Dholes due to its forested and hilly terrain, large portions of Kaziranga's open grasslands are likely less suitable for the species (Durbin et al. 2008; Bashir et al. 2014; Singh et al. 2020). This variability highlights the heterogeneous nature of the landscape in terms of its suitability as a Dhole habitat.

The persistence of the species in KKAL highlights the possibility of nearby source populations. One such source population is in Ntangi National Park in Nagaland (Srivathsa et al. 2020). Such dispersal is possible through the fragmented habitats of the Karbi Anglong District, which may act as a corridor facilitating movement between populations. Protected areas such as Morat Longri, northern Karbi Anglong, and eastern Karbi Anglong serve as ideal habitat patches that could support dispersal and provide stepping-stone habitats for wide-ranging species (Image 1). These protected areas and surrounding forests are likely to play a critical role in maintaining the metapopulation dynamics of Dholes in the region. The lack of recent sightings or reports from the area highlights the challenges posed by habitat



fragmentation and reduced connectivity. Therefore, it is crucial to identify and conserve potential source and sink populations within the larger landscape to ensure the persistence of Dholes.

The persistence of Dholes in this landscape is threatened by habitat fragmentation, reduced prey base, and retaliatory killings associated with Mithun depredation in Nagaland (personal communication with local communities during fieldwork December 2022). The fragmentation of corridors, particularly in the Karbi Anglong District, has likely disrupted the connectivity between source populations. This disruption may result in the isolation of small, vulnerable groups or even solitary dispersing individuals, thereby increasing their susceptibility to extirpation (Ginsberg & Macdonald 1990). While it is possible for a dispersing individual to establish a breeding pair and contribute to population growth, the lack of landscape connectivity poses a critical threat to long-term genetic viability. Furthermore, a decline in the prey base due to hunting of ungulates and competition with livestock has significantly reduced the availability of natural prey for Dholes (Wolf & Ripple 2017). These compounded threats highlight the urgent need for immediate policy intervention to address habitat fragmentation and ensure the persistence of both Dholes and their prey.

This study highlights the critical role of corridors in facilitating wildlife movement, ensuring habitat connectivity, and supporting species dispersal, especially during seasonal changes and extreme events like floods. In the absence of tigers and leopards, the Dhole assumes the role of apex predator in the ecosystem (Johnsingh 1992). Dholes are essential for regulating prey populations, and their persistence indicates the connectivity of the landscape. To ensure their conservation, future research should focus on understanding the movement ecology and connectivity of Dholes, as well as how corridor conservation benefits other species (Singh et al. 2020; Rodrigues et al. 2021).

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### Inventory of traditional medicinal plants and ethnobotanical knowledge from Hassan District, Karnataka, India

– Kushavara Venkatesh Amara, Gotravalli Manjunatha Prashanth Kumar & Rajkumar Hanumanthrao Garampalli, Pp. 27035–27063

### An annotated checklist of lianas in Manipur, India

– Longjam Malemnganbee Chanu & Debjyoti Bhattacharyya, Pp. 27064–27074

### New records and typification in family Poaceae from western Himalaya, India

– Smita Tiwari, Dileshwar Prasad, Sangam Sharma, Supriya Tiwari & Priyanka Agnihotri, Pp. 27075–27086

### Collection and lipid analysis of marine unialgal cyanobacteria: a case study from the southeastern coast of India

– Selvam Selvapriya & Sundaram Rajakumar, Pp. 27087–27097

### Range expansion of Indian Grey Hornbill population: a case study based on land use, land cover, and vegetation changes in Vadodara, Gujarat, India

– Parikshit Dhaduk & Geeta Padate, Pp. 27098–27109

## Communications

### A pioneer study of orchids on Nusa Barung Island of Indonesia

– Toni Artaka, Bina Swasta Sitepu, Fajar Dwi Nur Aji, Suryadi & Tri Atmoko, Pp. 27110–27115

### A bibliometric visualization of trends in Philippine sharks studies published in Scopus-indexed journals over the past five decades

– Merfat Ampong Sali, Najeeb Razul Ampong Sali, Araniza M. Diansuy, Anina Haslee A. Julkanain-Ong & Richard Nami Muallil, Pp. 27116–27124

### First camera-trap evidence of Dhole *Cuon alpinus* Pallas, 1811 (Carnivora: Canidae) from the Kaziranga-Karbi Anglong landscape, Assam, India

– Mujahid Ahamad, Jyotish Ranjan Deka, Priyanka Borah, Umar Saeed, Ruchi Badola & Syed Ainul Hussain, Pp. 27125–27130

### Distribution, habitat use and conservation status of Smooth-coated Otter *Lutrogale perspicillata* along the Cauvery and Kabini rivers, Karnataka, India

– Allison Amavisca, Raghunath Belur & Sugandhi Gadadhar, Pp. 27131–27140

## Review

### An annotated checklist of the genus *Amorphophallus* Blume ex Decne. (Araceae): an update on the distribution and conservation status of its species

– Norilyn Fontarum-Bulawin, Michael A. Calaramo & Grecebio Jonathan D. Alejandro, Pp. 27141–27158

## Short Communications

### *Embelia ribes* Burm.f. (Primulaceae) – an ayurvedic plant with ethnobotanical notes from Manipur, India

– Robert Panmei, Soyala Kashung, Lanrili Dangmei, Akoijam Surviya & Ungpemmi Ningshen, Pp. 27159–27162

### First record of marine isopod *Synidotea variegata* (Collinge, 1917), (Crustacea: Isopoda: Valvifera) from the Gulf of Kutch, Gujarat, northwestern coast of India

– Deep D. Dudiya, Mansi S. Goswami & Pranav J. Pandya, Pp. 27163–27166

### Lesser Blue-wing *Rhyothemis triangularis* Kirby, 1889 (Insecta: Libellulidae), a new addition to the dragonfly diversity of Rajasthan, India

– Anil Sarsavan, Manohar Pawar, Satish Kumar Sharma & Vinod Paliwal, Pp. 27167–27170

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