International Journal of Science, Strategic Management and Technology
Volume **02** Issue **05** May-**2026** | ISSN: **3108-1762 (Online)** | Impact Factor: 3.8
An International, Peer-Reviewed, Open Access Scholarly Journal Indexed in recognized academic databases

First Confirmed Record and Breeding Evidence of the Jungle Cat (*Felis Chaus*) In Jharkhand, India, With Notes on Habitat Ecology and Spatio-Temporal Micro-Distribution

Prosenjit Sarkar[1], Shivam Thakur[1], Gouri Guria[1], Amar Kumar[2], Abhishek Kumar[3], Saba Alam Ansari[4], Smitha Pankaj[5]

[1] Wildlife and biodiversity researcher and conservationist, Jamshedpur, Jharkhand, India

[2] Department of Zoology, Jamshedpur Cooperative college, Kolhan University, Chaibasa, Jharkhand, India

[3] District Forest Officer, Jharkhand, India

[4] Divisional Forest Officer, Dalma Wildlife Sanctuary, Jamshedpur, Jharkhand, INDIA

[5] Regional Chef Conservator of Forest, Singhbhum, Jharkhand, INDIA

Email- *prosen0018@gmail.com*, *shivamlifesciences05@gmail.com*

ORCID: https://orcid.org/0009-0002-8974-9968, https://orcid.org/0009-0008-2813-2167

Corresponding Author- Prosenjit Sarkar

https://doi.org/10.55041/ijsmt.v2i5.265

Cite this Article: Thakur, S., Guria, G., Kumar, A., Kumar, A., Ansari, S. A. & Pankaj, S. (2026). First Confirmed Record and Breeding Evidence of the Jungle Cat (Felis Chaus) In Jharkhand, India, With Notes on Habitat Ecology and Spatio-Temporal Micro-Distribution. International Journal of Science, Strategic Management and Technology, *02*(05). https://doi.org/10.55041/ijsmt.v2i5.265

Abstract

The Jungle cat (*Felis chaus*) is a extensively distributed small wild felid belonging to order carnivora. However, the ecological information from the state of Jharkhand remains limited. The current study focuses on documenting the ecological observations, spatio-temporal distributions and habitat association of *Felis chaus* across different locations in Jharkhand. A total of ten independent sightings were recorded between April 2020 and May 2026 from districts East-Singhbhum, Saraikela Kharsawan and West-Singhbhum. Species was observed across diversified habitat types including agro-scrub mosaic, riparian corridors, mixed deciduous forests and in vicinity of reservoir ecosystems. They show crepuscular activity mostly and dwell in proximity of water source. The distribution of species in human modified as well as protected landscaped highlights its persistence in fragmented habitat and high level of ecological adaptability. This study provides the 1st report, and photographic evidence from state of Jharkhand and also emphasise on the importance of landscape level conservation approaches.

Keywords: *Felis chaus*, Agro-scrub mosaic, Dalma Wildlife Sanctuary, Crepuscular

Introduction

The Jungle Cat (*Felis chaus*) is a habitat generalist that flourish in heterogeneous landscapes, particularly where natural vegetation intermingles with agriculture. The Jungle Cat (*Felis chaus*) is a medium sized felid that is extensively distributed across South and Southeast Asia, engaging a broad spectrum of habitats. The habitat ranges from wetlands and grasslands to agricultural landscapes and prominently the scrublands. In India, the species is regarded as ecologically

versatile and is frequently associated with Human-modified environments where prey resources, in particular the rodents are plentiful. Despite the ubiquitous distribution, the detailed ecological information at finer spatial scales remains constrained, especially from understudied and unexplored regions of Jharkhand. Ecologically, the species is primarily solitary and territorial, displaying crepuscular to nocturnal activity patterns, although diurnal activity may be exhibited in areas with minimal disturbance. It is an opportunistic predator, feeding majorly on small rodents, shrews, along with the birds, reptiles, insects and occasionally small amphibians. Their dietary flexibility allows the species to exploit agricultural landscapes and the edge habitats very efficiently. Along with that it plays pivotal role in regulation the population of prey, especially rodents that in turns accounts for the agricultural yield loss. Breeding in jungle cat is affected generally by environmental conditions rather than strict seasonality in tropical and sub-tropical regions. Female give birth to litters of usually two to four kittens in concealed dens with dense vegetations. The presence of juvenile along with the adult is the indicative of well established, breeding population and also indicates the habitat suitability, and resource availability. Morphologically, the Jungle Cat displays intermediate sexual dimorphism, with males generally larger and more robust than females. The species is characterised by Sandy-brown to greyish coat, long legs, and distinct black-tipped tail, features that provide effective camouflage in open and semi-arid habitats. Females are being comparatively smaller and more cryptically coloured which makes them even better adapted for concealment during breeding and rearing of its progeny. Despite the fact that the species have been reported from various parts of India, its occurrence in Jharkhand remains poorly documented, likely due to the limited survey efforts and the general neglect of small carnivores in biodiversity related studies. Interpreting habitat ecology and micro-distribution patterns are prerequisite for assessing species persistence in fragmented and human influenced landscapes. In this context, the present study provides the 1st confirmed record of the Jungle Cat from Jharkhand along with its photographic evidences from multiple sites, observations of habitat ecology, breeding evidence, parental care and localised distribution, thereby contributing the baseline data for future ecological and conservation-based researches. In recent past, wildlife has been subjected to elevated threats by anthropogenic induced activities such as narrowed and disrupted habitat, dwindling numbers of prey in their natural habitat and unsatisfactory nutrition due to their proximity to human settlements (Dhungana et al., 2017; Kerley et al., 2002; Treves and Karanth, 2003). Contributing factors such as forest fires, increased tourism, rapid industrialization along with illegal and excessive hunting all assists to habitat disturbance and destruction of the wildlife fauna (Soyumert, 2010; Ünal and Çulhacı, 2018).

Scientific Classification

Kingdom: Animalia

Phylum: Chordata

Class: Mammalia

Order: Carnivora

Family: Felidae

Subfamily: Felinae

Genus: *Felis*

Species: *F. chaus*

Study Area

The present study was conducted in the state of Jharkhand, mainly in the eastern parts of the state from March 2020 to May 2026. The study sites encompass multiple sites across the districts of East Singhbhum, Saraikela Kharsawan, and West Singhbhum. After monitoring multiple sites, the observations were made and recorded from *Chandil, Chowka, Picchli*, *Hurlung, Kakrajhore, Kadamjhore, Ghatsila, Dalbhumgarh, Chakulia (D.W.S.*), and *Sitarampur Dam*. The study area lies within the Chotanagpur Plateau region, defined by the heterogeneous terrains and landscapes. The elevation of the region ranges approximately from 98 meters to 278meters above the sea level. The landscape composes of a mosaic

of habitat types, including agro-scrub mosaics, agricultural lands interspersed with scrub vegetation, riparian corridors, reservoir ecosystem, and mixed deciduous forests along with Sal dominated areas. Study sites such as *Chandil* and *Hurlung* represents forest-edge and agro-scrub habitats with dense cover of shrub. Area such as Sitarampur Dam are connected to artificial water reservoirs system adjacent to forested area. Chakulia lies in the premised of Dalma Wildlife Sanctuary, which is a protected area, rich in biodiversity. Chowka, Kadamjhore, Picchili, are semi-rural, agricultural landscapes with seasonal crop plantations. Ghatsila, Kakrajhore, Dalbhumgarh include sparse of mixed deciduous forests with fluctuating degree of anthropogenic influence. The climatic conditions of the region where study sites are located are fairly predictable, with temperature ranging from 17.6°C in winter to 34.6°C during the pre-monsoon period. The striking similarity between sites even after diverse topology and conditions where Jungle Cats were recorded, is the proximity of the sites to perennial or seasonal water sources. The water sources include, dam, river, ponds and reservoirs typically located within the distance of 200 meters to 1.4 kilometre. The Study area experiences low to moderate anthropogenic disturbance pressure due to human settlements, resource extraction and agricultural activities. The region provides dynamic landscape that supports diverse ecological niche fairly suitable for small carnivores like *Felis chaus.*

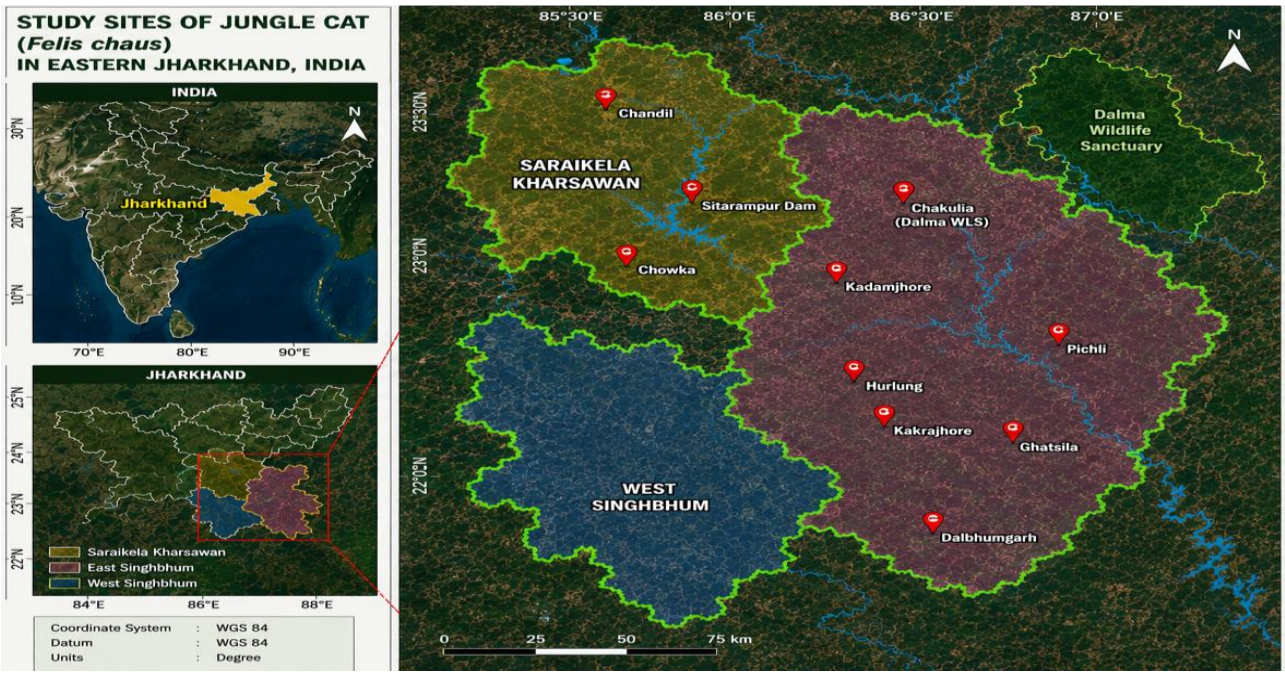

Image 1- Map showing the study area and sites

Method

Field data on the occurrence of *Felis chaus* were collected between April 2020 to May, 2026 across multiple locations across eastern parts of Jharkhand, India. Observations were obtained through opportunistic sighting based on regular surveys conducted across diverse habitats. Each event of sighting was documented with month and year, number of individuals, age groups whether adult or juvenile, and the geographical coordinates using handheld GPS devices (Garmin Etrex). A total of 10 independent records were made, and 12 adults and 2 juveniles were recorded. This includes observations from Chandil (April, 2020), Sitarampur Dam (December, 2020), Chakulia in D.W.S. (February, 2021), Kadamjhore (November, 2022), Hurlung (January, 2023), Chowka (March, 2023), Pichli (May, 2023), Kakrajhore (February, 2024), Ghatsila (February, 2025) and Dalbhumgarh (May,2026). The individuals were also photographed used a high-quality camera with long zooming capacity. During the course of filed study, habitat type, key habitat features, and elevation along with climatic conditions of the sites were also recorded to give clear picture of the conditions. The ambient temperature of the site, its proximity to the water source, water source type, were also recorded during study. All observations were done in non-invasive manner and are based on direct visual encounters, without the use of trapping or baiting. Species identification was confirmed using morphological characteristics standards, as described in field guides.

The dataset was analysed descriptively to assess various parameters such as spatio-temporal occurrence, seasonal parameters, habitat association patterns across the study regions.

Result and Observation

During the course of study that started in April 2020 and went till May 2026, a total of 10 independent sightings were made across multiple sites in Jharkhand. The sites include -*Chandil, Chakulia (D.W.S.), Kadamjhore, Hurlung, Chowka, Kakrajhore, Ghatsila, Dalbhumgarh, Sitarampur Dam* and *Pichili*. The observations made, were distributed across the districts of East-Singhbhum (50%), West-Singhbhum (10%) and Saraikela Kharsawan (40%). The sites represent variety of natural and human influenced and human modified landscapes. The species were encountered in agro-scrub mosaics, agricultural landscapes, riparian corridors and reservoir ecosystem along with Sal dominated and mixed deciduous forests. Habitat-wise allocation revealed that 30% of the sightings made were associated with agricultural and agro-scrub landscapes, indicating its habitat preference. Forest-edge and mixed deciduous forest type landscape accounted for 20% records. Another 20% records collectively come from riparian corridor and reservoir-associated habitat. This also indicated the generalist nature of the species and broad habitat tolerance. Most sighting were recorded in close proximity to the water source which was either seasonal or perennial such as dams, reservoirs, ponds, stream, or rivers. The elevation above sea level was in the range of 98-278meters above sea level. Finding also indicate that the Felis chaus is positively related with open habitats throughout its range (Chatterjee *et al*.2020, Prater *et al*.,1971, Nowell *et al*., 1996). Seasonal observations were also made and records were procured during pre-monsoon, post-monsoon, early and late-winter, and during summer evening as well. The ambient temperature of the sites where species were observed ranged between 17.6°C and 34.6°C. Temporal distributions were also made during the study and it suggests that majority of the sightings were made during evening hours (17:00 H-19:30 H). This analysis shows that 70% of sightings were made during evening time. This suggests the predominant crepuscular activity of the animal.

It can be ascertained that Jungle cats prefer area of moderate to low rainfall, will suitably higher temperatures, and lesser canopy cover (Bandyopadhyay *et al.,* 2024). A single day time record was observed from Hurlung during January, 2023. It is worthy to note that most of the records involved single adult, moving in solitary. However, one observation made at Hurlung documented adult female accompanied by two juvenile kittens, providing evidence of breeding activity in the vicinity. Along with that observation made at Sitarampur dam recorded a pair of adults that may indicate paired association. The occurrence of *Felis chaus* near village fringes, transition areas, agricultural fields, riparian corridors and protected area boundaries suggests its ecological adaptability within the heterogeneous landscapes.

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Image 2: Photographs of the *Felis chaus* recorded during field study from different sites.

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Sl. No.	Location (Locality)	Site Details / Protected Area	Date of Sighting (Month, Year)	No. of Individuals (Adult / Kitten)	Geographical Coordinates (WGS 84)		Elevation (m a.s.l.)	Habitat / Landscape Type	Climatic Conditions (Average)*		Nearest Water Source (Type & Distance)	Remarks (Season)
					Latitude (N)	Longitude (E)			Temperature (°C)	Relative Humidity (%)		
1	Chandil (Seraikela)	—	April, 2020	1 Adult	22°39'33.0" N	86°05'19.0" E	214	Sal forest with open grasslands and small water bodies	29.7	42	Reservoir ~1.35 km (E)	Pre-monsoon (late spring)
2	Sitarampur Dam	—	December, 2020	2 Adults	22°35'40.6" N	86°15'28.2" E	132	Reservoir ecosystem with surrounding deciduous forest	18.5	57	Dam ~0.22 km (NW)	Early winter
3	Chakulia (DWS)	Dalma Wildlife Sanctuary	February, 2021	1 Adult	22°48'21.0" N	86°21'15.0" E	126	Agricultural landscape with scattered villages and hedgerows near Dalma hills	21.8	52	River (Perennial) ~1.18 km (SW)	Late winter
4	Kadamjhore	—	November, 2022	2 Adults	22°55'10.4" N	86°05'27.3" E	243	Moist deciduous forest with riverine vegetation (Subarnarekha tributary)	22.6	61	River (Perennial) ~0.62 km (S)	Post-monsoon (autumn)
5	Hurlung	—	January, 2023	1 Adult, 2 Kittens	22°48'11.7" N	85°54'45.2" E	278	Forest-fragmented landscape with streams and rocky terrain	17.6	56	Stream (Perennial) ~0.31 km (NE)	Mid winter
6	Chowka (Seraikela)	—	March, 2023	1 Adult	22°43'26.4" N	86°18'55.2" E	187	Sal (*Shorea robusta*) dominated dry deciduous forest with scrub patches and agricultural fields	24.3	48	River (Perennial) ~0.74 km (W)	Pre-monsoon (early spring)
7	Pichli	—	May, 2023	1 Adult	22°28'37.5" N	86°28'14.8" E	98	Agricultural fields with irrigation channels and scrub vegetation	33.8	55	Checkdam ~0.19 km (E)	Pre-monsoon (summer)
8	Kakrajhore	—	February, 2024	1 Adult	22°33'16.7" N	86°24'53.0" E	114	Mixed deciduous forest with stream and rocky outcrops	22.0	53	Stream (Perennial) ~0.27 km (SE)	Late winter
9	Ghatsila	—	February, 2025	1 Adult	22°37'24.6" N	86°18'36.7" E	150	Mixed landscape of forest patches, villages and terraces	21.8	51	River (Perennial) ~1.65 km (NW)	Late winter
10	Dalbhumgarh	—	May, 2026**	1 Adult	22°25'41.2" N	86°41'25.6" E	111	Rural landscape with agriculture, ponds and secondary vegetation	34.6	57	Pond (Man-made) ~0.21 km (S)	Pre-monsoon (summer)

Image 3- Table showing sighting records, spatio-temporal distribution, water-source habitat and climate summary

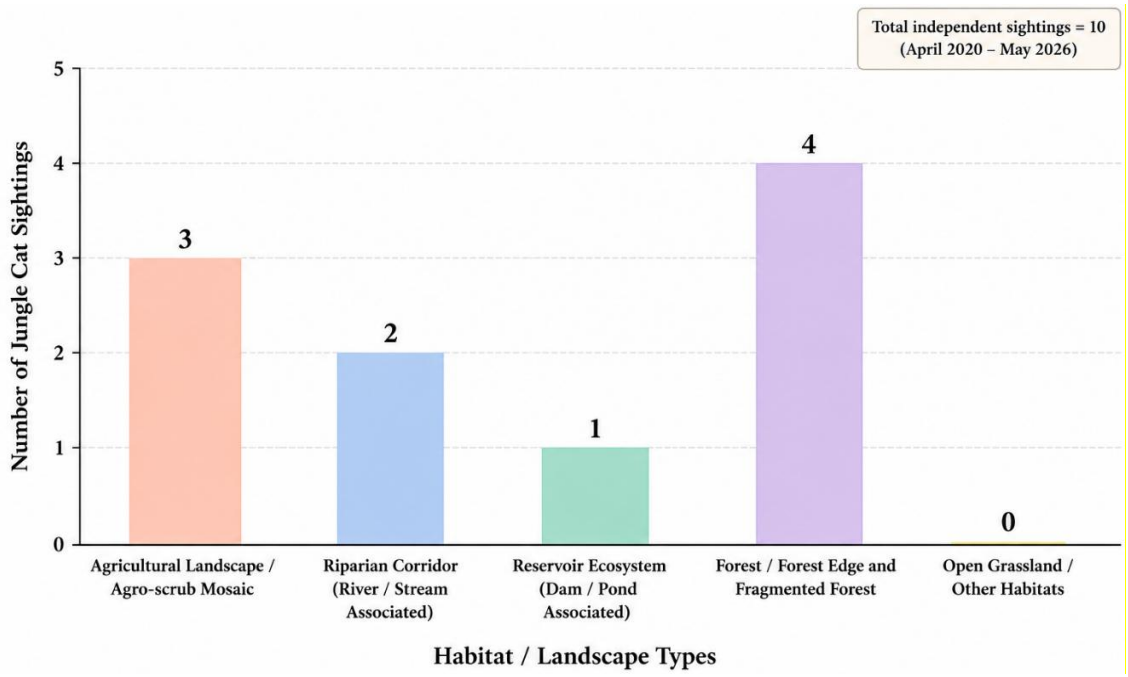

Image 4- Bar graph showing habitat v/s. no. of sightings of *F. chaus*

Sl. No.	Location (Locality)	Date of Sighting (Month, Year)	Sighting Time (IST)	No. of Individuals
1	Chandil (Saraikela)	April 2020	5:45 PM	1 Adult
2	Sitarampur Dam	December 2020	6:00–6:30 PM	2 Adults
3	Chakulia (DWS)	February 2021	7:00–7:15 PM	1 Adult
4	Kadamjhore	November 2022	7:00–7:30 PM	2 Adults
5	Hurlung	January 2023	3:00–3:30 PM	1 Adult + 2 Kittens
6	Chowka (Saraikela)	March 2023	6:00–6:30 PM	1 Adult
7	Pichli	May 2023	5:15–5:30 PM	1 Adult
8	Kakrajhore	February 2024	5:30 PM	1 Adult
9	Ghatsila	February 2025	5:45 PM	1 Adult
10	Dalbhumgarh	May 2026	7:00 PM	1 Adult

Image 5: Table showing sighting records and time

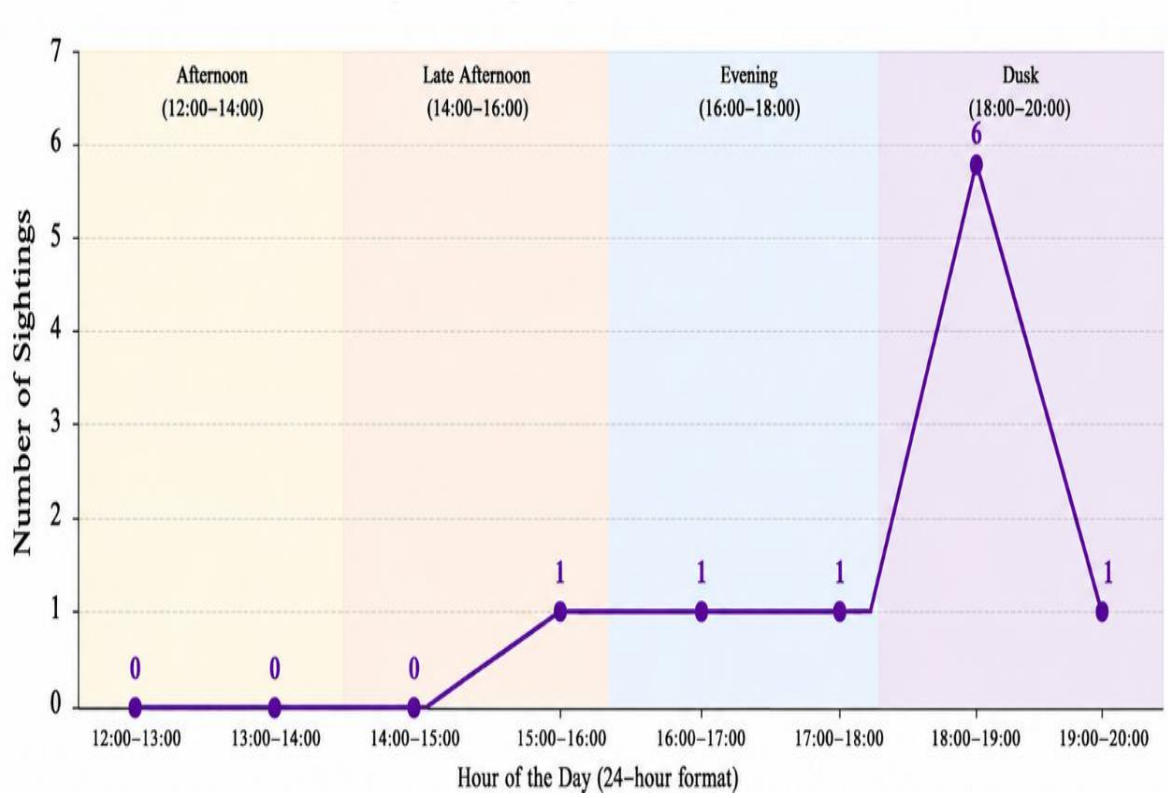

Image 6: Worm-graph showing Sightings v/s. hour of the day

Behavioural Observations

Behavioural monitoring of *F.chaus* during the breeding and rearing period displayed a cautious yet highly adaptive pattern on movement and reactions in human-modified landscapes. Adult individuals were active predominantly during crepuscular and nocturnal hours of the day, indicating the elevated movement in proximity of agricultural field margins, agro-scrub mosaics, and dense grass covered areas. In Hurlung, mother along with her two kittens were observed. Mother

showed strong parental care, with repeated shifting between the concealed resting sites and foraging sites. During the course of movement, the mother was seen keeping close vigilance over her kittens. Juveniles were observed engaging in small chasing movements, playful stalking, pouncing which is attributed to the early hunting practice behaviours. During the feeding events, kittens exhibited increasing curiosity and active participation in handling of the prey, which in turns indicates the gradual advancement of predatory skills. The adults remained vigilant to its surrounding disturbances and retreated quickly to safe hides upon sensing proximal human activities or loud noise. The coat colouration, slender body, large sensitive ears, and strong limbs aids them in leaping ,hiding, chasing, hunting and other behavioural activities important for its efficient survival.These observations signify that Felis chaus possesses considerable behavioural versatility, which enable them to survive efficiently in fragmented stretches of agro-natural and man-influenced ecosystems while still continuing to perform its ecological and trophic role as carnivore predator.

Additional Opportunistic Recordings

Additional opportunistic sightings records of the Jungle Cat were further made from S*undarnagar*, *Luabasa* and the *Kharkhai* river bank in East Singhbhum district, Jharkhand. Thus, strengthening the evidence of the species' occurrence across riparian, peri-urban and heterogeneous human-modified landscapes of the region. Comprehensive and detailed ecological parameters and associated habitat variables for these additional records were not investigated in the present study. Further detailed study of related parameters will be addressed and presented in subsequent research communications.

Ecological Importance

The Jungle cat (*Felis chaus*) perform a significant ecological role in maintaining the functioning and stability of terrestrial, agro-scrub type semi-wetland ecosystems. As a mesopredator, it engages in intermediate trophic level and contribute significantly in regulation of population size of small vertebrated and invertebrates. The diet of Jungle cat predominantly comprises of small birds, rodents, reptiles, insects and amphibian. This is an important aspect in controlling the agricultural pest population which are known to damage the crops and also contributes to post harvest loss. In agro-ecosystems, the species facilitates in benefitting the local farming communities through biological pest control, particularly in the regions with high rodent infestation. The species additionally functions as ecological indicator of the habitat heterogeneity and the connectivity of the landscapes. Its presence across riparian corridors, scrublands, agricultural mosaics and forest edges reflects the overall ecological health and the functional continuum of the fragmented landscapes. Due to its dependence on prey sufficient environments, the presence of *F. chaus* often indicates the availability of microhabitats that support broader faunal diversity. In riparian corridors and agro-scrub type landscapes, Jungle cat contributes majorly in maintaining prey-predator balance and thus can also influence the spatial behaviour and distribution of smaller sympatric carnivores through niche partitioning. Small carnivore such as jungle cat aids in maintenance of healthy ecosystem by supporting essential ecotones, checking the population dynamics of rodents, and consequentially aiding pastoral agricultural systems through pest downregulation (Mukherjee *et al*., 2004, Hofmeester *et al*., 2017). The control of rodents also checks the epidemic related to them from outbreaking. Furthermore, by utilising natural and human-modified landscapes, they demonstrate ecological plasticity. This makes them an important model in understanding carnivore adaptation in rapid colonizing and changing environments. They are important component of trophic level and increases the complexity and resilience of ecosystem that stabilises the ecosystem further.

Ethical Considerations

The above observations were make using non- invasive methods, primarily through scheduled and opportunistic field sightings on the basis of regular visits to assess the habitat. Photographic documentations were also made, ensuring no direct handling, disturbance or capture of animals. The study adheres to standard protocol of wildlife observation, maintaining adequately safe distance from the individuals to minimise distress and behavioural adjustments. This study doesn't engage any baiting, trapping or sound manipulations which may in turn disturb the animals. Field observations were performed in accordance with the guidelines of Wildlife Institute of India and general ethical frameworks for wildlife related researches and observations. All efforts were made to avoid interference with natural behaviours, particularly

during the breeding or rearing of cubs, as evident by observation of an adult female with juveniles at Hurlung region. Locations were accessed and assessed without provoking the animal or causing habitat degradation. Special care was taken to avoid trampling or disrupting the microhabitats and the vegetation of the study sites.

Acknowledgement

The authors express their sincere gratitude to all the individuals who were directly or indirectly involved in successful completion of this study. Special thanks are extended to Mrs. Gauri Guria, and Mr. Akash Jaiswal, for their valuable field assistance, continuous support during surveys. The authors are also thankful to local residents and the forest fringe communities for sharing information, regarding the wildlife occurrences and facilitating access to several locations during the course of study. Appreciation is extended to forest staffs, rangers, and official for their support. Finally, authors acknowledge all the wildlife enthusiasts and researchers whose previous studies assisted in species identification and ecological interpretations during the research.

Conflict of Interests: Authors claim no conflict of interests.

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