

Conservation Status Report of **Sloth Bear** Sanctuaries in India



भारतीय वन्यजीव संस्थान
Wildlife Institute of India



A young sloth bear cub is the central focus of the image, standing in a field of dry, yellowish-brown grass. The cub has dark, shaggy fur and a lighter-colored patch on its chest. It is looking directly at the camera with a calm expression. The background is a soft, out-of-focus field of similar grass, creating a warm, natural setting.

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Conservation and Management of **Sloth Bear** in India

A National, Science-led Initiative for Human-Bear Interface Management
and Sloth Bear Conservation, Advancing Coexistence



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Advisors

Dr. G.S. Bhardwaj, Director
Wildlife Institute of India
Dr. Ruchi Badola, Dean
Wildlife Institute of India

Sh. Ramesh Pandey
Additional Director General of Forests (Wildlife)
Ministry of Environment, Forest & Climate Change
Government of India

Supervisors & Reviewers:

Principal Investigator (PI & Coordinator EIACP-WII): Dr. Ramesh Chinnasamy

Co-Principal Investigators (Co-PIs): Dr. Bivash Pandav, Dr. K. Ramesh, Sh. Maria Christu Raja D., Dr. Samrat Mondol, Dr. Amit Kumar

Conceptualization: Ramesh Chinnasamy, Upma Manral, Ashish K. Jangid

Editing: Ramesh Chinnasamy, Upma Manral, Utkarsh Prajapati

Content Development: Ashish K. Jangid, Shikhar Kaushik, Yogesh G.,
Utkarsh Prajapati, Suraj Chauhan, Avinash Yadav

Maps & Plots: Yogesh G., Shikhar Kaushik, Ashish K. Jangid

Design & Layout: Khushi Rawat, Ashish K. Jangid

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*Gazette Notifications for
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Foreword

The Wildlife Institute of India was established with a mandate to advance science and practice of wildlife conservation in India through rigorous research, capacity building and systematic documentation. Over the past four decades, the Institute has developed robust traditions of field-based and evidence-driven inquiries that bridges ecological research with conservation management of threatened species. This report presents a comprehensive assessment of the ecological status, habitat characteristics and conservation challenges of Sloth Bear Sanctuaries in India. This assessment has been produced by the research team under the Project Sloth Bear, in collaboration with Environmental Information, Awareness, Capacity Building and Livelihood Programme (EIACP), Wildlife Institute of India and Ministry of Environment, Forest and Climate Change (MoEFCC) with funding support from National Compensatory Afforestation Fund Management and Planning Authority (CAMPA).

The Sloth Bear remains an ecologically important species that has received comparatively limited scientific attention. It exhibits specialised myrmecophagous feeding behaviour and a wide range of dietary adaptability across diverse habitats, from moist deciduous forests to dry thorn scrubs. However, research on the species has remained geographically uneven, methodologically inconsistent and insufficiently integrated with long-term research, conflict management and monitoring frameworks. A key contribution of this report is its comprehensive and curated status assessment of the bear sanctuaries in India. This effort extends beyond academic convention by providing a structured overview of existing knowledge and identifying critical research gaps. The sanctuary-level bibliographies reveal significant disparities in research attention. Population assessments for this species primarily rely on indirect methods, such as sign surveys and waterhole counts and are further complicated by substantial occurrences outside protected areas. These knowledge gaps pose significant challenge for both scientific research and management.

The Institute has consistently promoted the adoption of standardised, landscape-scale approaches to wildlife population assessment. For Sloth Bears, this requires a shift to systematic methodologies, such as camera-trap-based sampling designs and genetic analyses, to understand population structure and functional connectivity across the country. Scientific findings have a greater impact when communicated effectively to diverse stakeholders, including forest department officials, field-level managers, local communities and scientific explorers. Photographic documentation, distribution mapping and landscape surveys contextualise ecological data within real-world settings to strengthen understanding and engagement. The Wildlife Institute of India remains dedicated to advancing conservation science for all components of India's biodiversity, including species that have historically received limited attention within flagship conservation frameworks. As articulated in this report, Sloth Bears warrant significantly greater scientific, managerial and institutional focus. Its continued presence across India's landscapes serves as a key indicator of the ecological integrity of deciduous and scrub ecosystems that support both wildlife and human livelihoods.

I appreciate the efforts of Project Sloth Bear team and endorse this report as a valuable and authoritative resource for researchers, conservation practitioners and forest administrators engaged in the stewardship of Sloth Bear habitats across India.

Dr. Gobind Sagar Bhardwaj
Director
Wildlife Institute of India



सत्यमेव जयते



Preface

India's natural heritage is closely linked to the forests, grasslands and scrublands that sustain its rich biodiversity. Among many species inhabiting these ecosystems, the Sloth Bear holds a unique distinction as the only bear species endemic to the Indian subcontinent and an important part of tropical deciduous forest landscapes. Recent research and documentation focusing on the systematic assessment of dedicated protected areas are enhancing the evidence base required for informed conservation planning and management.

The Ministry of Environment, Forest and Climate Change (MoEFCC), through key policy frameworks, such as the Wildlife (Protection) Act, 1972, its subsequent amendments and National Wildlife Action Plan, continues to guide and strengthen India's efforts towards wildlife conservation. These efforts are supported by a growing emphasis on scientific research, systematic documentation and informed management practices. This report, focusing on India's dedicated protected areas for Sloth Bear, namely Jessore Sloth Bear Sanctuary, Ratanmahal Sloth Bear Sanctuary, Karotri Sloth Bear Sanctuary, Gudekote Sloth Bear Sanctuary and Arasikere Sloth Bear Sanctuary, holds significant conservation value. Together, these sanctuaries span approximately 550 square kilometres within predominantly human-dominated landscapes. Their ecological value is substantial, as they function as source populations, stepping stones and critical refugia that sustain connectivity across increasingly fragmented habitats.

These landscapes are multifaceted and shaped by a range of ecological and anthropogenic factors, including evolving land-use patterns. This underscores the need for careful planning and management across these regions. In this context, the Ministry of Environment, Forest and Climate Change recognises the strategic importance of comprehensive status assessments and systematic documentation. By integrating ecological data with site-specific insights and management considerations, this report provides a practical resource for field practitioners and researchers. This report is expected to contribute to a consolidated understanding of Sloth Bear distribution and conservation contexts within protected areas, highlighting the role of site-based interface management in safeguarding the species and supporting informed decision-making. It is expected that this work will catalyse greater attention to Sloth Bear conservation, support the development of targeted, species-specific management strategies and contribute to the broader objectives of maintaining ecological connectivity across landscapes where wildlife and human communities must coexist sustainably.

I commend the research team under Project Sloth Bear at the Wildlife Institute of India for this timely and valuable contribution to India's conservation literature. Effective wildlife governance rests on a foundation of credible evidence and informed decision-making. This report makes a meaningful contribution to strengthening that conservation foundation.

(Ramesh Pandey)



जल विंग, पंचम तल, इंदिरा पर्यावरण भवन, जोर बाग रोड़, नई दिल्ली-110 003, फोन: 011-20819180

Jal Wing, 5th Floor, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110 003, Ph. : 011-20819180

E-mail : ramesh.pandey@nic.in



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Summary

This report presents a structured and science-based synthesis of the conservation status of Sloth Bear protected areas in India. As the only bear species endemic to the Indian subcontinent, the Sloth Bear occupies a wide range of habitats, yet has historically received comparatively limited attention within India's conservation framework. A substantial number of protected areas fall within its distribution range, largely within deciduous forests. However, these landscapes remain variably understood, particularly in terms of how ecological processes are shaped by dynamic resource use and anthropogenic pressures. In this context, sanctuary-level assessments provide a critical and fine-scale understanding of the current status of these protected areas, their conservation challenges and potential management interventions. This report further evaluates land cover changes within and around these protected areas over the past decade (2015-2025) and maps adjacent protected areas to identify potential connectivity pathways for wildlife movement. By integrating spatial analyses, ecological insights and site-specific documentation, the report consolidates fragmented knowledge into a coherent and accessible national perspective.

This report serves as a practical and policy-relevant conservation asset that bridges ecology with management and decision-making. It systematically evaluates landscape composition, habitat dynamics and human influences across key Sloth Bear habitats in India, while identifying critical knowledge gaps, inconsistencies in population assessment and need for standardised monitoring approaches. By combining ecological evidence with management context, the report provides an actionable foundation for forest managers, researchers and conservation practitioners. It establishes a baseline for long-term monitoring, supports prioritisation of conservation interventions and contributes to strengthening coexistence strategies in landscapes where human-bear interactions are inevitable. In doing so, it enhances the evidence base for adaptive management and reinforces the importance of species-specific, landscape-oriented assessments within India's broader conservation agenda.



Status of Sloth Bears in India

India supports four species of bears (Family *Ursidae*): Sloth Bear (*Melursus ursinus*), Himalayan Brown Bear (*Ursus arctos isabellinus*), Asiatic Black Bear (*Ursus thibetanus*) and Malayan Sun Bear (*Helarctos malayanus*). Among these, the Sloth Bear is unique in being endemic to the Indian subcontinent and widely distributed across tropical and subtropical landscapes. Its distinct ecological adaptations, particularly its specialisation on social insects, set it apart from other bear species occurring in India.

Sloth Bears (*Melursus ursinus* Shaw, 1791) are large-bodied, nocturnal and omnivorous mammals, characterised by a shaggy black to dark brown coat, a prominent white chest mark (rarely absent) and specialised morphological adaptations, such as elongated claws and a modified snout for myrmecophagy with absence of upper incisors. Evolutionarily, Sloth Bears diverged approximately four million years ago from their sister taxa within the bear lineage. Two subspecies are currently recognised: *Melursus ursinus ursinus* (Indian Sloth Bear) and *Melursus ursinus inornatus* (Sri Lankan Sloth Bear), found to be distributed through India, Nepal and Bhutan, and Sri Lanka, respectively.

Sloth Bears are primarily myrmecophagous, feeding extensively on ants and termites, with habitat preference influenced by the resource availability and their seasonal patterns. Their diet is, however, diverse and opportunistic, including honey, fruits, flowers and leaves, such as *Diospyros melanoxylon* (Tendu), *Ziziphus mauritiana* (Ber), *Cassia fistula* (Amaltas), *Aegle marmelos* (Bel) and *Madhuca longifolia* (Mahua). Seasonal variation plays a key role in dietary composition, with insect-based diets dominating in winter and plant-based resources becoming more important during summer and monsoon periods.

Historically, global population estimates for Sloth Bears ranged between 10,000 and 25,000 individuals, with India's estimates varying from approximately 6,000 to 11,000 individuals. More localised estimates, such as in Gujarat, indicate an increase from 220 individuals in 2001 to 358 individuals in 2022, counted by the Gujarat Forest Department, although these are largely based on waterhole census methods. Despite these estimates, robust nationwide population assessments remain limited, particularly given that a substantial proportion of the species range occurs outside protected areas.

Sloth Bears face multiple conservation challenges, primarily driven by habitat loss, fragmentation and human-induced pressures. Increasing land-use change outside protected areas has resulted in degraded habitats and disrupted connectivity. Additionally, poaching for body parts, including claws, bile and meat, has intensified over recent decades. Sloth Bears are listed under Schedule I of the Wildlife (Protection) Act, 1972 (amendment 2022) and also included in Appendix I of CITES.

The species is distributed across the Indian subcontinent, occupying a wide range of habitats from the tropical moist deciduous forests of the Terai Arc landscape and northeastern floodplains to the dry deciduous, thorn and scrub forests of central and western India, and extending into the southern peninsular landscapes. Despite this broad distribution, local extirpations have been reported from parts of Bangladesh and Bhutan. Currently, Sloth Bears are known to be distributed across approximately 23 Indian states and >40 Tiger Reserves.

India, despite covering only 2.4% of the global land area, harbors significant biodiversity supported by an extensive protected area network spanning approximately 1,87,613 km² (5.70% of the country). Notably, Sloth Bears frequently utilise human-dominated landscapes, including agricultural fields and forest fringes.



In this context, bear-specific Sanctuaries play a crucial role in strengthening conservation efforts. India currently supports five dedicated Sloth Bear Sanctuaries located in Gujarat and Karnataka, collectively covering approximately 550 km². These include Jessore and Ratanmahal in Gujarat and Daroji, Gudekote and Arasikere in Karnataka. Although relatively small landscapes within human-dominated areas, these sanctuaries encompass critical dry deciduous, thorn and scrub forest ecosystems that provide essential resources, such as denning sites, seasonal food availability and refuge from disturbances. Beyond habitat protection, these sanctuaries function as source populations and stepping stones in facilitating movement and maintaining structural and potentially functional connectivity across fragmented landscapes. Given the varied sizes of home ranges and seasonal resource shifts, the surrounding areas of the sanctuaries serve as vital corridors for dispersal and long-term persistence. As such, they complement India's existing conservation framework by addressing species-specific ecological needs and reinforcing landscape-level connectivity.

Sloth Bear, being a conflict-influenced species, however, its population estimates remain fragmented and methodologically inconsistent, largely due to variations in survey approaches and its space use outside protected areas. Nevertheless, available assessments indicate that central and western India constitute major strongholds, particularly in states, such as Madhya Pradesh, Odisha, Maharashtra, Chhattisgarh, Karnataka, Gujarat and Rajasthan. Significant populations are also reported from Andhra Pradesh, Telangana, Tamil Nadu, Kerala, Uttar Pradesh and Assam, while a few areas in northeastern India have been surveyed for Sloth Bears, confirming their presence at lower elevations in Arunachal Pradesh and Meghalaya. However, systematic surveys in these states, including Uttarakhand, are required to be undertaken to better understand distribution extents of the species. Most existing estimates are derived from indirect methods, such as sign surveys or waterhole counts, highlighting the urgent need for standardised, landscape-scale population assessments using robust approaches, such as camera trapping and genetic sampling. Strengthening state-level population monitoring is essential for appropriate conservation planning, prioritising corridors and evaluating long-term population trends of this widely distributed yet under-assessed species.



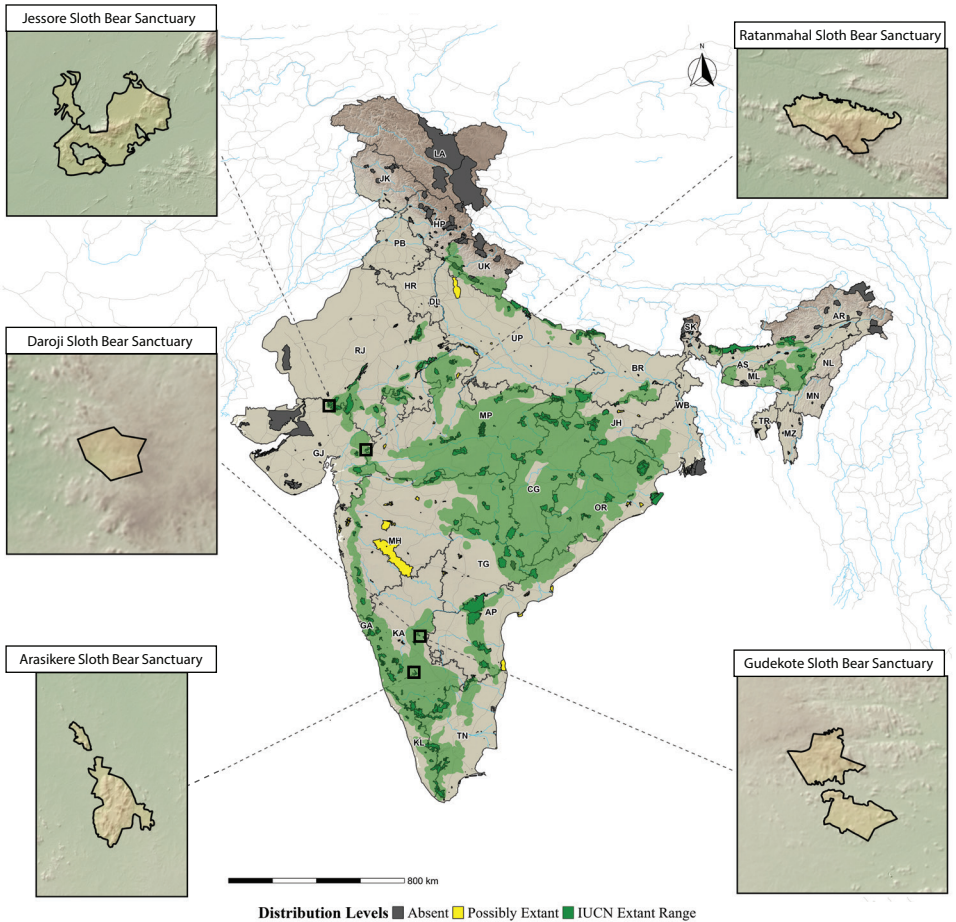


This report presents a comprehensive assessment of Sloth Bear Sanctuaries in India, examining their ecological status, habitat characteristics and conservation significance within human-dominated landscapes. It also evaluates land cover changes over the past decade within each sanctuary and their 5 km buffer to identify patterns of habitat change and emerging threats due to human-associated practices. The report aims to provide a practical and policy-relevant framework for strengthening Sloth Bear conservation across diverse ecological settings in India.

Available state-level population estimates as per the National Bear Conservation and Welfare Action Plan (2012) highlight the high variability and uncertainty in Sloth Bear population assessments across India, indicating differences in survey methods, temporal coverage and scales. Chhattisgarh reported a notably high estimate of 13,028 individuals (2006-07), whereas states, such as Maharashtra (658 individuals during 2010-11), Rajasthan (749 individuals during 2010-11) and Odisha (785 individuals during 2010-11) indicate regionally important populations. Moderate estimates are available from Gujarat (282 bears in 2011) and West Bengal (200 bears in 2004), while figures from Jharkhand (1,200-1,500) and Chhattisgarh remain largely uncertain.

In southern India, Tamil Nadu shows a marked population of 310 Sloth Bears in 2010-11, whereas estimates from Karnataka are fragmented and site-specific (eg., Daroji, Bannerghatta, Bandipur Tiger Reserve), limiting broader inference. Similarly, only localised protected area-based estimates are available for Madhya Pradesh (eg., Sanjay Tiger Reserve ~500, Pench ~60 and Kuno ~20). Smaller and spatially restricted populations are reported from Uttarakhand (172 in 2008, with low-elevation forest division-level estimates), Uttar Pradesh (119 from Kaimoor Forest Division during 2011-12) and parts of eastern India. As emphasised in the National Bear Conservation and Welfare Action Plan (2012), such disparate and often non-standardised estimates focus on broader issues of data deficiency and highlight the lack of coordinated monitoring frameworks for bears across India, particularly in landscapes that function as corridors and protected areas. Addressing these gaps through systematic, landscape-scale assessments and harmonised methodologies is essential for generating reliable population baselines and strengthening conservation planning at both state and national levels.

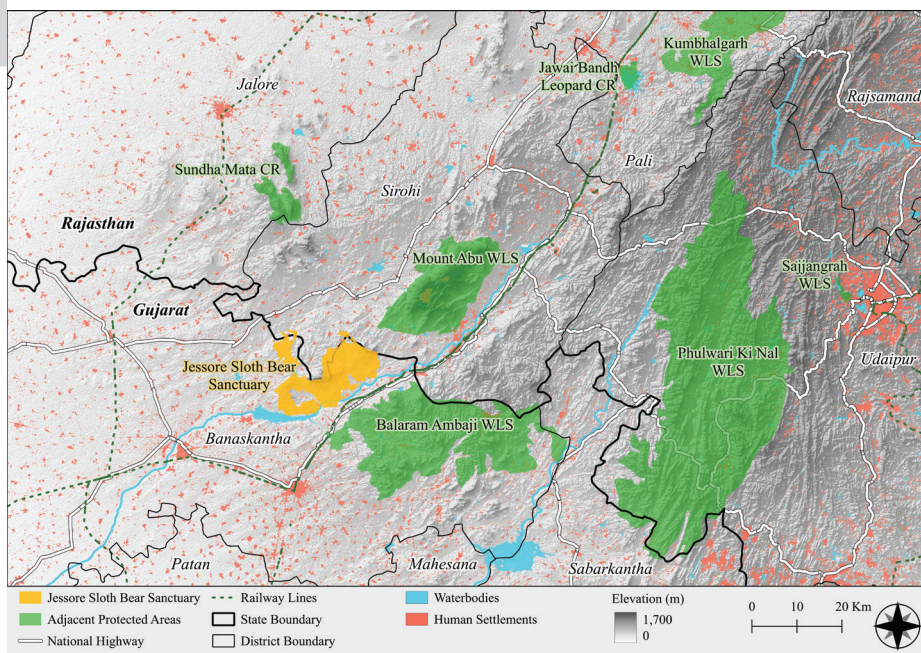
Sloth Bear Distribution in India



Distribution of Sloth Bears in India across the Protected Area Network and the Distribution of Sloth Bear Sanctuaries (list of Protected Areas are attached in Annexure 1)



Jessore Sloth Bear Sanctuary



Map depicting the Jessore Sloth Bear Sanctuary located along the Gujarat-Rajasthan boundary, showing adjacent protected areas important for potential dispersal (eg., Baram-Ambaji Wildlife Sanctuary, Mount Abu Wildlife Sanctuary, Sundha Mata Conservation Reserve and Phulwari Ki Nal Wildlife Sanctuary), along with settlements, linear infrastructures, major drainage networks and topography

Area: 180.66 km² (24.40943° N 72.49865° E)

District: Banaskantha (Gujarat)

Habitat: Tropical Dry Deciduous Forest and Desert Thorn Forest (Champion & Seth, 1968; types 5A & 6B). The sanctuary represents the southernmost part of the Aravalli landscape, characterised by dry deciduous and thorn scrub vegetation within semi-arid conditions.

Terrain: Undulating to hilly terrain with prominent rocky outcrops, granite boulders and stabilised sand dunes. These geological features provide critical denning and resting habitats for Sloth Bears and other wildlife.

Key flora: *Anogeissus pendula* (Dhok), *Cassia fistula* (Amaltas), *Aegle marmelos* (Bel), *Butea monosperma* (Palash), *Diospyros melanoxylon* (Tendu), *Ziziphus mauritiana* (Ber), *Acacia nilotica* (Desi Babool).

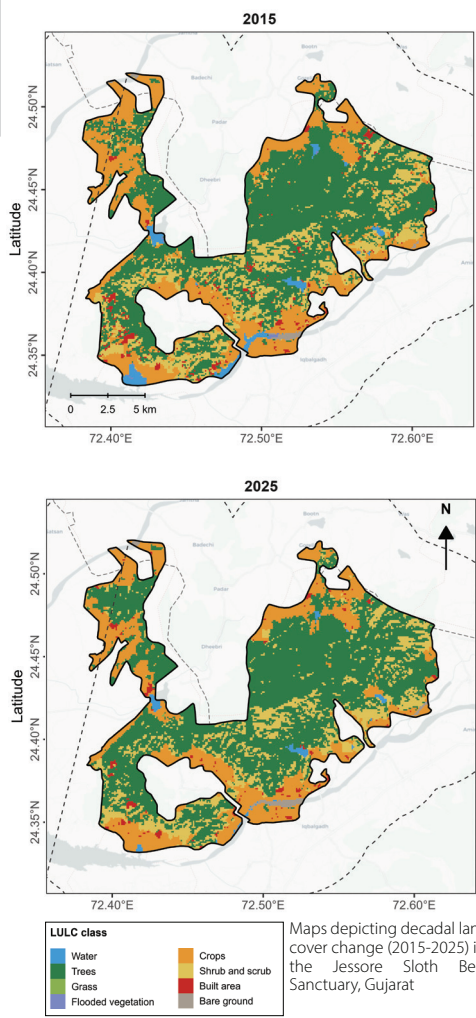
Key mammals: *Melursus ursinus* (Sloth Bear), *Panthera pardus* (Leopard), *Hyaena hyaena* (Hyena), *Manis crassicaudata* (Indian Pangolin), *Mellivora capensis* (Honey Badger).

Key birds: *Pavo cristatus* (Indian Peafowl), *Ortygornis pondicerianus* (Grey Francolin), *Pycnonotus cafer* (Red-vented Bulbul), *Copsychus fulicatus* (Indian Robin), *Mycteria leucocephala* (Painted Stork), *Ciconia episcopus* (Asian Woolly-necked Stork), *Platalea leucorodia* (Eurasian Spoonbill), *Anastomus oscitans* (Asian Openbill), *Sterna aurantia* (River Tern)

Adjacent protected areas with Sloth Bears (possible corridor connectivity): Mount Abu-Jessore, Jessore-Balaram Ambaji, and possibly to Sundhamata Conservation Reserve and Phulwari Ki Nal Wildlife Sanctuary.

Gazette notification: May 1978 (Notification no. GH-KH-65/ 78- WLP/ 2077/ 62041-P dated the 6th May, 1978)

Change in land cover



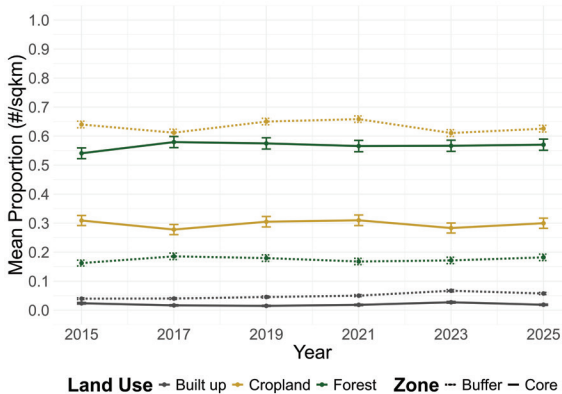
The Jessore Sloth Bear Sanctuary is situated within the rugged terrain of the southern Aravalli Range, forming part of the westernmost extent of the global distribution of the Sloth Bear. The sanctuary holds additional conservation significance due to its transboundary connectivity with adjoining forested landscapes of Sirohi and Jalore districts in Rajasthan. Land cover analysis over the past decade indicates a relatively stable but human-influenced landscape matrix. Within the sanctuary, cropland makes a major proportion of approximately 25-30% per km², while forest cover (including tree and scrub-dominated habitats) ranges between 20% and 30%. Outside the sanctuary, agricultural dominance is more pronounced, with cropland covering 60-65% and forested areas (largely degraded or open-canopy forests) accounting for 50-55%. A small proportion (~5-8%) of the surrounding landscape is occupied by human settlements, while very few human settlements have been mapped within the sanctuary boundary.

These patterns are characteristics of tropical dry deciduous and thorn scrub forests of western India, where natural vegetation often exists as a mosaic interspersed with agricultural land uses.

Maps depicting decadal land cover change (2015-2025) in the Jessore Sloth Bear Sanctuary, Gujarat



© Ashish Jangid



Change in proportional land cover (mean $\pm$ SE / km²) from 2015 to 2025 in the Jessore Sloth Bear Sanctuary, Gujarat

Such ecosystems are inherently dynamic, shaped by seasonal rainfall variability, anthropogenic pressures and historical land-use practices. Notably, a slight decline in cropland extent across the broader landscape, suggesting either marginal land cover transitions toward regenerating vegetation.

Localised ecological recovery is evident within the sanctuary. A small but significant increase in mean forest cover has been observed in the northeastern area, which are actually growing patches of *Prosopis juliflora* in plains.

The central and northwestern regions experienced forest regeneration and canopy recovery. In dryland ecosystems, such as Jessore, even modest gains in woody vegetation and shrub cover can substantially enhance habitat suitability by improving food availability (eg., termites and fruits) denning and refuge for Sloth Bears.

Local communities and their dependence: *Thakur, Chauhan, Koli, Rabari, Waghari, Garasia, Damor, Gomar, Khokharia, Vansia, Kharaddi, Bheel*



© Ashish Jangid

Local economy is largely based on agriculture and livestock. Rabari community is known to rear livestock since historical times. The people depend on the forest for fuelwood, fodder, livestock grazing, honey, tendu, gums, wild fruits and medicinal plants. Honey collection constitutes a key human use within Sloth Bear habitats, representing an important human-wildlife interface that can influence habitat quality and species presence.

Conservation challenges:

1. Human-bear conflict driven by seasonal resource overlap

Jessore Sanctuary and its surrounding landscape support a high density of Sloth Bears relative to its small area. The sanctuary is surrounded by agricultural fields and human settlements that seasonally overlap with resource use with Sloth Bears. Key wild food plants, including *Syzygium cumini* (Jamun), *Ziziphus mauritiana* (Ber) and *Diospyros melanoxylon* (Tendu) are harvested by local communities during early monsoon.

2. Invasive alien plant species

The invasion of *Prosopis juliflora* and *Lantana camara* across deciduous habitats of the sanctuary has resulted in intensive habitat degradation. *P. juliflora* forms dense thickets that outcompete native understorey flora, reducing bear food plants and altering structural complexity of bear habitats. *L. camara* suppresses native regeneration and reduces understorey foraging options. These invasions effectively shrank functional bear habitats in sanctuary, which require appropriate quantified assessment.

3. NTFP collection

Collection of non-timber forest products (NTFP) from forest areas represents one major driver of human-bear confrontations. Honey collection is widely practiced by the *Garasia* and *Waghari* communities, resulting in high-risk spatial overlap with Sloth Bear habitats. The use of fire or smoke to drive bees can often lead to forest fires and can influence Sloth Bear activity.

4. Habitat fragmentation

Habitat fragmentation poses a significant threat to Jessore Sloth Bear Sanctuary. Situated at the western edge of the Sloth Bear distribution range, Jessore is a relatively small habitat patch. Although it retains structural connectivity with nearby protected areas, such as Mount Abu Wildlife Sanctuary and Balaram-Ambaji Wildlife Sanctuary, this connectivity is functionally limited by intervening agriculture, settlements and road networks. The surrounding landscape forms a human-modified mosaic of forest and cropland, reducing permeability for wildlife movement and restricting dispersal. While habitat quality within the sanctuary shows signs of improvement, long-term persistence of Sloth Bears will depend on restoring functional connectivity across the broader landscape.

5. Unregulated livestock grazing

Unregulated livestock grazing within the sanctuary particularly goats, sheep and cows by pastoralist communities with large herds causes multifaceted impacts on Sloth Bear habitat. Overgrazing reduces dietary items from understorey vegetation, which indirectly affects availability of termites and ants. Livestock presence also increases human footfall, elevating encounter probability. Along with humans, frequency of free-ranging dogs also increases in sanctuary, affecting other wildlife as well.

6. Lack of standardised population monitoring

Despite its protected status, Jessore Sloth Bear Sanctuary has not been subject to systematic field-based population assessments for Sloth Bears. Existing studies in and around the sanctuary have largely focused on human-bear interactions, dietary patterns and habitat connectivity in regard to Sloth Bears. As a result, key information gaps persist regarding population monitoring, carrying capacity and efficacy assessment of conservation interventions.



7. Linear infrastructure

Linear infrastructure of rail and national highway restricts the Sloth Bear movement across the nearby protected areas, these linear infrastructure also increases risk of mortality due to vehicular collisions.

8. Lack of dedicated bear rescue and rehabilitation infrastructure

Jessore in north Gujarat lacks fully equipped wildlife rescue and rehabilitation facilities despite high numbers of human-bear interactions. Unavailability of such facility limits the effective management of injured or conflict-affected Sloth Bear individuals, as well as orphaned juveniles. This also limits the capacity for veterinary assessment, which is critical for understanding post-conflict status and planning mitigation strategies.

9. Forest fires

Forest fires in Jessore occur predominantly during summers, largely driven by anthropogenic activities, such as honey collection and NTFP extraction. These fires degrade understorey vegetation and hinder regeneration of native plants. Repeated summer fires also alter habitat structure, displace bears and increase their movement into human-dominated areas along with habitat fragmentation and invasive species.

Potential management measures to address key challenges:

1. Ex-gratia scheme:

Strengthening Ex-gratia mechanisms to reduce retaliatory responses and promote tolerance among local communities, with emphasis on timely disbursement and process efficiency.

2. Invasive species removal:

Focusing on mechanical removal with root extraction, particularly for *Prosopis juliflora* and *Lantana camara*, to prevent coppice regrowth, alongside sustained efforts to address reinvasion from persistent seed banks.

3. Habitat restoration through indigenous species planting:

Prioritising native food plants to improve in-situ resource availability, thereby reducing Sloth Bear dependence on human-use areas.

4. Corridor management and connectivity:

Targeted actions to maintain and improve functional connectivity between habitats to ensure safe movement and to reduce isolation of bear populations.

5. Community stakeholder engagement:

Adoption of co-management approaches to build local ownership, recognising that participatory conservation yields more sustainable outcomes than enforcement alone. Awareness programs designed to influence behaviour, reduce risky interactions and address key drivers of human-bear conflict through awareness activities and local involvement.

6. Institutional support:

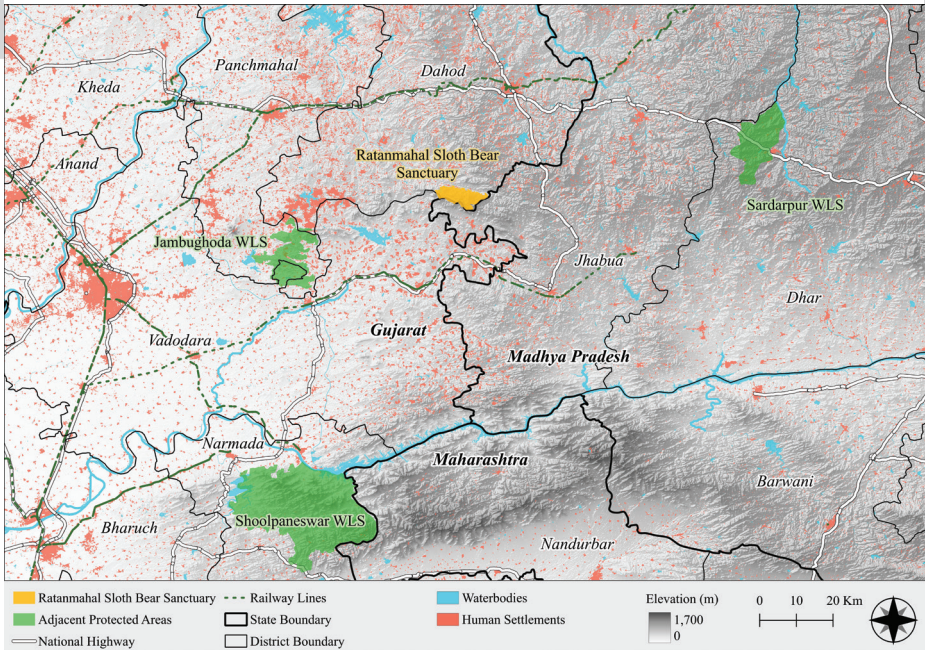
Leveraging National-Level frameworks to enhance resources, coordination and long-term conservation planning for Sloth Bears.

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Ratanmahal Sloth Bear Sanctuary



Map depicting the Ratanmahal Sloth Bear Sanctuary located along the Gujarat-Madhya Pradesh boundary, showing adjacent protected areas important for potential dispersal (eg, Jambughoda Wildlife Sanctuary, Sardarpur Wildlife Sanctuary and Shoolpaneswar Wildlife Sanctuary), along with settlements, linear infrastructures, major drainage networks and topography

Area: 55.65 km² (22.55576° N 74.11802° E)

District: Dahod (Gujarat)

Habitat: Tropical moist deciduous forest (Teak-dominated), mixed deciduous with dry bamboo brakes, *Diospyros melanoxylon* (Tendu) forest patches; *Terminalia tomentosa* (Sadad) forest patches on plateaus (Champion & Seth 1968; types 3C & 4A)

Terrain: Rugged hilly terrain of the Ratanmahal hills (easternmost extension of Vindhyan ranges bordering Madhya Pradesh), rocky outcrops, ravines and seasonal streams; Mira waterfall within sanctuary; River Panam originates here

Key flora: *Tectona grandis* (Teak), *Madhuca latifolia* (Mahua), *Diospyros melanoxylon* (Tendu), *Terminalia tomentosa* (Sadad), *Syzygium cumini* (Jamun), *Bambusa sp.* (Bamboo), *Emblica officinalis* (Amla), *Butea monosperma* (Palash), *Ziziphus mauritiana* (Ber), *Anogeissus latifolia* (Dhavdo), *Dalbergia sp.* (Sissoo), *Annona squamosa* (Sitaphal).

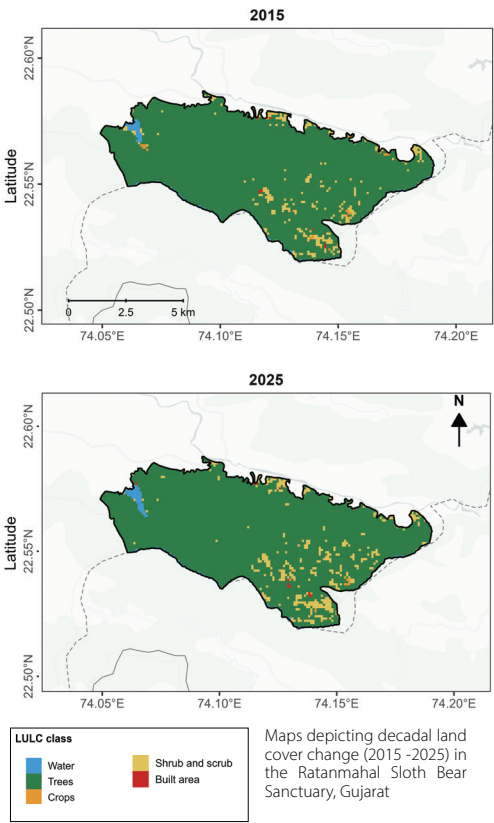
Key mammals: *Melursus ursinus* (Sloth Bear), *Panthera pardus* (Indian Leopard), *Hyaena hyaena* (Striped Hyena), *Tetracerus quadricornis* (Four-horned Antelope or Chousingha), *Canis aureus* (Golden Jackal), *Mellivora capensis* (Honey Badger), *Felis chaus* (Jungle Cat), *Urva edwardsii* (Indian Grey Mongoose), *Semnopithecus entellus* (Hanuman Langur), *Hystrix indica* (Indian Crested Porcupine), *Vulpes bengalensis* (Indian Fox).

Key birds: *Spilornis cheela* (Crested Serpent Eagle), *Gallus sonneratii* (Grey Junglefowl), *Cinnyris lotenius* (Loten's Sunbird), *Machlolophus spilonotus* (Yellow-cheeked Tit), *Dicrurus paradiseus* (Greater Racket-tailed Drongo), *Dicrurus caerulescens* (White-bellied Drongo), *Terpsiphone paradisi* (Indian Paradise Flycatcher).

Adjacent protected areas with sloth bears (possible corridor connectivity): Ratanmahal-Jambughoda, Ratanmahal-Sardarpur, Ratanmahal-Polo Reserve Forest and Ratanmahal-Shoolpaneswar Wildlife Sanctuaries

Gazette notification: April 1982 (Notification no. AKH/53/82/WLP 1081/119648-V2 dated 19th March 1982)

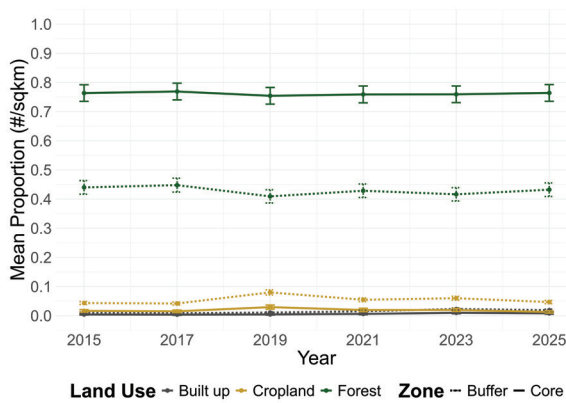
Change in land cover



The decadal land cover change analysis for the Ratanmahal Sloth Bear Sanctuary indicates that landscape transformations over the past decade (2015-2025) have remained relatively minimal, reflecting a largely stable forest ecosystem. The sanctuary is dominated by a substantial proportion of forest canopy, particularly within its core, which continues to exhibit high structural integrity and limited anthropogenic disturbance. However, minor spatial shifts are evident along the southeastern periphery of the sanctuary, where localised transitions from forest to scrub habitats have been observed. These changes are primarily confined to edge zones and may be attributed to increased anthropogenic pressures, including resource extraction and dependency on forest products by adjacent human settlements. Such edge effects highlight areas with increased ecological vulnerability, where habitat degradation may gradually influence wildlife movement and habitat quality.



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Change in proportional land cover (mean $\pm$ SE / km²) from 2015 to 2025 in the Ratanmahal Sloth Bear Sanctuary, Gujarat

Across the decade, the core zones of Ratanmahal have remained comparatively stable when evaluated alongside other Sloth Bear landscapes in India. The extent of human settlements within and around the sanctuary is relatively limited, especially when compared to more human-dominated regions, such as Banaskantha in Gujarat or Bellary in Karnataka.

Similarly, cropland constitutes only a minor fraction of the surrounding landscape, accounting for approximately 10% within the buffer zone.

The landscape matrix of Ratanmahal reflects a predominantly forested system with low to moderate anthropogenic influence, reinforcing its importance as a relatively intact habitat for Sloth Bears. Nevertheless, continued monitoring of peripheral zones is essential to detect early signs of habitat alteration and to guide targeted conservation interventions.



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Local communities and their dependence: *Variya, Koli, Rathwa, Mavi, Bhuria, Dangi, Vakhala, Baria, Parmar, Tadvi, Pavar, Ninama, Nayak, Dhanaka.*

The livelihood dependency of these local communities is largely associated with farming and associated activities, and significant population is dependent on the forest for firewood and other NTFP products. They also sell NTFP and wild fruits in the market. Apart from that, they largely collect Mahua flowers from the forest.

Conservation challenges:

1. Livestock grazing pressure

Sloth bear habitats face constant pressure from livestock grazing in areas surrounding the sanctuary. Unregulated grazing by livestock in and around Sloth bear habitats drastically alters vegetation composition. This change further affects insect and fruit availability, impacting Sloth Bear food resources.

2. Invasive plant species

Habitat alteration due to high invasion of *Prosopis juliflora* and *Lantana camara* has negatively impacted Sloth Bear habitat use. Replacement of native floral species by these invasive alien species has reduced food resources and vegetation cover preferred by Sloth Bears for various activities.

3. Pilgrimage pressure within the sanctuary

A temple located in the middle of the sanctuary attracts a large number of pilgrims throughout the year. This influx of people into Sloth Bear habitats poses a significant threat to the habitat.

4. Mining and habitat fragmentation

Mining activities in the surrounding areas have contributed to habitat degradation and fragmentation of contiguous forest patches. This affects the connectivity within the broader landscape and the movement of Sloth Bears across protected and non-protected areas, restricting movement and increasing human-wildlife interactions.

5. Tourism pressures

Tourism and related activities in Ratanmahal are largely confined to specific locations around pilgrimage and access roads. The core remains largely intact, but localized disturbances in edge zones and along access routes may contribute to gradual habitat modification and increased disturbance if left unregulated.

6. Forest degradation and resource pressure

Forest quality in Ratanmahal is increasingly affected by sustained human dependence on natural resources, including fuelwood collection, grazing and extraction of non-timber forest products. These activities gradually alter vegetation structure, reduce regeneration and degrade habitat conditions critical for Sloth Bears, particularly in peripheral and accessible areas.

7. Forest fires

Recurring forest fires during the dry season pose a significant threat to forest stability. Largely anthropogenic in origin, these fires damage vegetation, reduce food availability and influence denning habitats. Repeated burning can further lead to more open and less suitable habitat conditions for wildlife.



Potential management measures to address key challenges:

1. Strengthening landscape-level conservation planning

The National Bear Conservation and Welfare Plan (2012) provides a strategic framework for long-term conservation. Its implementation at the landscape scale, including linkages between Ratanmahal and adjoining forested areas, could contribute to maintaining connectivity and supporting population viability. Additionally, forested habitats outside sanctuary has been reported with several denning incidents for Sloth Bears, which indicates that forested areas and rocky outcrops outside sanctuary should also be promoted for conservation actions.

2. Regulation of human movement and disturbance

Strict regulation of vehicular movement is essential to reduce disturbance and accidental encounters. Additionally, regulating pilgrim and tourist access through designated timings, routes and carrying capacity limits will help minimise pressure on core habitats.

3. Habitat restoration and connectivity

Continued restoration of degraded forest patches and strengthening of ecological corridors across Ratanmahal and adjacent landscapes, such as Jambughoda and Aravalli forest division in Gujarat and Sardarpur in Madhya Pradesh are critical for maintaining gene flow and enabling safe wildlife movement.

4. Community-based conservation and livelihood support

Reducing dependency on forest resources through alternative livelihood programmes, eg., eco-development, value addition of NTFPs, skill-based employment, can significantly lower pressure on habitats while ensuring community participation in conservation.

5. Fire management and prevention

Implementation of community-based fire management strategies, including early detection systems and awareness programs and increase in forest staff is essential to reduce frequency and control faster to lower the impact of forest fires during dry seasons.

6. Control of invasive species

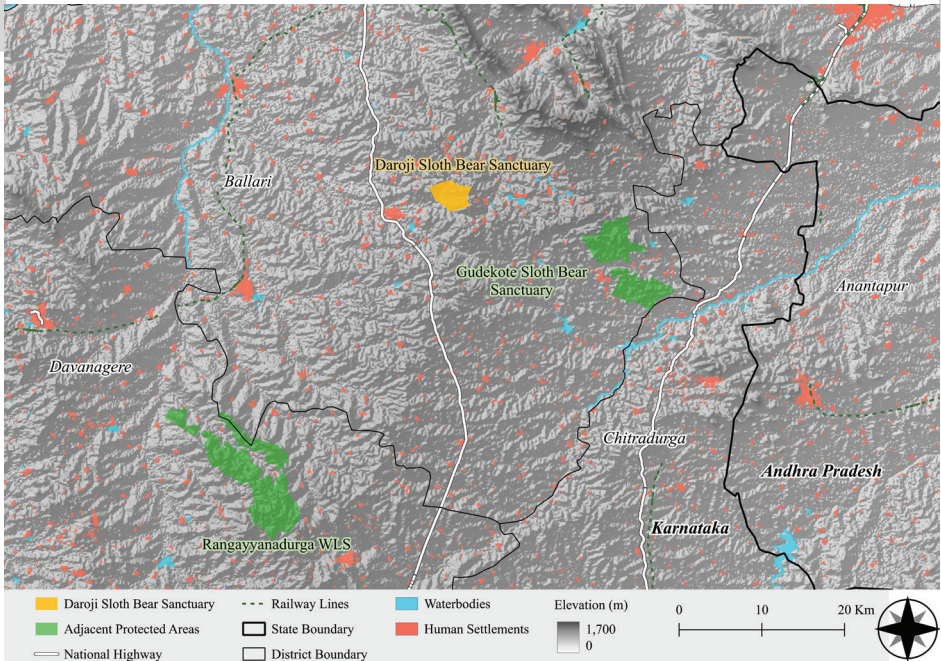
Active management of invasive plants through removal and replacement with native species will improve habitat quality and restore ecological balance.

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Daroji Sloth Bear Sanctuary



Area: 82.72 km² (14.92571° N 76.45363° E)

District: Ballari (Karnataka)

Habitat: Southern tropical thorn forest and dry deciduous scrub forest (Champion & Seth 1968; types 5B & 6); rocky xerophytic vegetation on the Deccan Plateau, granite boulder-strewn hillocks with natural caves and crevices serving as primary denning sites for Sloth Bears.

Terrain: Undulating Deccan Plateau landscape with granite hillocks, rocky outcrops, boulders and caves; iron and manganese-rich substrate; Karadikallu Gudda is the principal hillock with several bear caves; located adjacent to the Hampi World Heritage Site.

Key flora: *Azadirachta indica* (Neem), *Tamarindus indica* (Tamarind), *Butea monosperma* (Palash), *Madhuca latifolia* (Mahua), *Ziziphus mauritiana* (Ber), *Annona squamosa* (Sitaphal), *Syzygium cumini* (Jamun), *Euphorbia* spp., xerophytic plants.

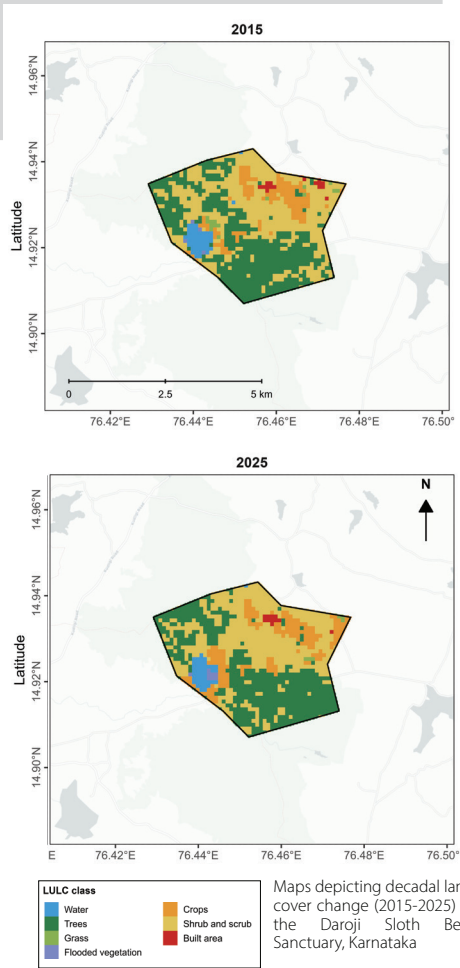
Key mammals: *Melursus ursinus* (Sloth Bear), *Panthera pardus* (Indian Leopard), *Hyaena hyaena* (Striped Hyena), *Canis lupus* (Indian Wolf), *Canis aureus* (Golden Jackal), *Vulpes bengalensis* (Indian Fox), *Felis chaus* (Jungle Cat), *Hystrix indica* (Indian Porcupine), *Manis crassicaudata* (Indian Pangolin).

Key birds: *Picus xanthopygaeus* (Streak-throated Woodpecker), *Falco peregrinus* (Peregrine Falcon), *Capromulgus indicus* (Indian Jungle Nightjar), *Otus bakkamoena* (Indian Scops-Owl), *Leptocoma zeylonica* (Purple-Rumped Sunbird), *Platalea leucorodia* (Eurasian Spoonbill), *Dendrocygna javanica* (Lesser Whistling Duck), *Nisaetus cirrhatus* (Changeable Hawk Eagle), *Ciconia episcopus* (Asian Woolly-necked Stork).

Adjacent protected areas with Sloth Bears (possible corridor connectivity): Gudekote SBS; Tungabhadra Wildlife Sanctuary and rocky scrub habitats in Sandur and Ramasagar.

Gazette notification: October 1994 (Notification no. FEE-159/FWL-91 dated the 17th October 1994)

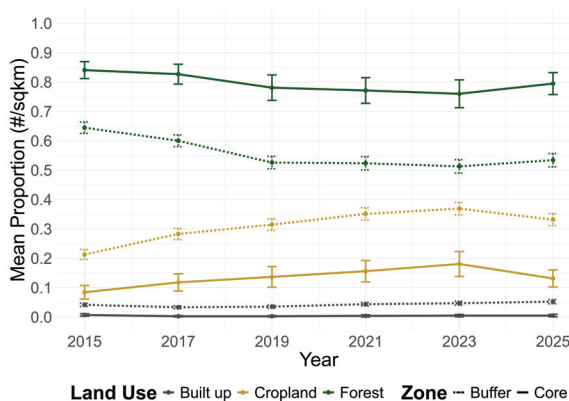
Change in land cover



The decadal land cover change analysis for the Daroji Sloth Bear Sanctuary indicates substantial landscape transformations and its surrounding buffer zones between 2015 and 2025. The most prominent trend is a decline in forest and scrub cover, accompanied by a significant expansion of croplands, reflecting increasing human influence and associated habitat loss for Sloth Bears. Conversion has been particularly pronounced in scrub-dominated areas, which have progressively transitioned into agricultural land. Cropland extent has increased markedly, almost doubling since 2015, intensifying land-use practices in the surrounding landscape. In contrast, sparse tree cover has remained relatively stable, suggesting that land-use change has primarily targeted open and degraded habitats.

This pattern indicates a growing imbalance between fragile scrub ecosystems and expanding agricultural matrices. Given the ecological importance of scrub habitats for Sloth Bears, particularly for foraging and movement, which is likely to elevate the risk of human-wildlife interactions beyond the protected boundary.

Maps depicting decadal land cover change (2015-2025) in the Daroji Sloth Bear Sanctuary, Karnataka



Change in proportional land cover (mean $\pm$ SE/km²) from 2015 to 2025 in the Daroji Sloth Bear Sanctuary, Karnataka

Over the decade, these changes have occurred progressively, with only limited recent signs of recovery within the sanctuary. Buffer areas continue to show higher levels of conversion and fragmentation. Built-up land remains minimal and largely unchanged, indicating agricultural expansion. Overall, the Daroji landscape reflects a shift toward human-modified systems, focusing on the need for targeted conservation interventions to maintain habitat integrity and reduce conflict risks.

Local communities and their dependence: *Nayaka/Naik/Nayak, Beda/Bedar, Valmiki, Konda Kapu, Chodhara*. Local communities are mostly dependent on agriculture and livestock rearing. They also cultivate economically valuable plants.

Conservation challenges:

1. Human-dominated landscape and conflict

The sanctuary is surrounded by human-dominated areas with a large number of agricultural fields. This leads to habitat fragmentation and increases human-bear conflict. Due to the abundance of food crops, bears frequently raid crops outside protected areas.

2. Mining pressure and habitat degradation

Mining in surrounding areas, particularly iron ore mining, has increased significantly since 2000 particularly in the Ballari district due to rising international demand. Currently, approximately 0.5% of the total geographical area of the district is used for mining and quarrying. Satellite imagery from 2004 indicates that around 1500 ha of land has been opened for mining, 156 ha for dumping mining waste and 223 ha for quarrying. These activities severely affect habitat quality and pose a constant threat to bear movement.

3. Invasive alien species

The presence of invasive species (largely *Lantana camara* and *Prosopis juliflora*) has significantly increased, leading to a decline in habitat quality. Habitat degradation and fragmentation are driven by anthropogenic activities, such as conversion of forest land to agriculture and developmental activities, which alter landscape structure and vegetation composition. Biodiversity assessment is important during this period as many plant and animal species face threats due to unmanaged plant invasion.



4. Forest fires

Fire is a recurring feature in the Ballari during summers. Controlling fire in dry areas is also difficult which causes damage to vegetation composition and structure. The landscape primarily consists of dry deciduous and scrub forests, which are prone to surface fires that can escalate further into crown fires. Fires are often caused by cattle herdsman or local people burning grasses and vegetation after harvesting crops.

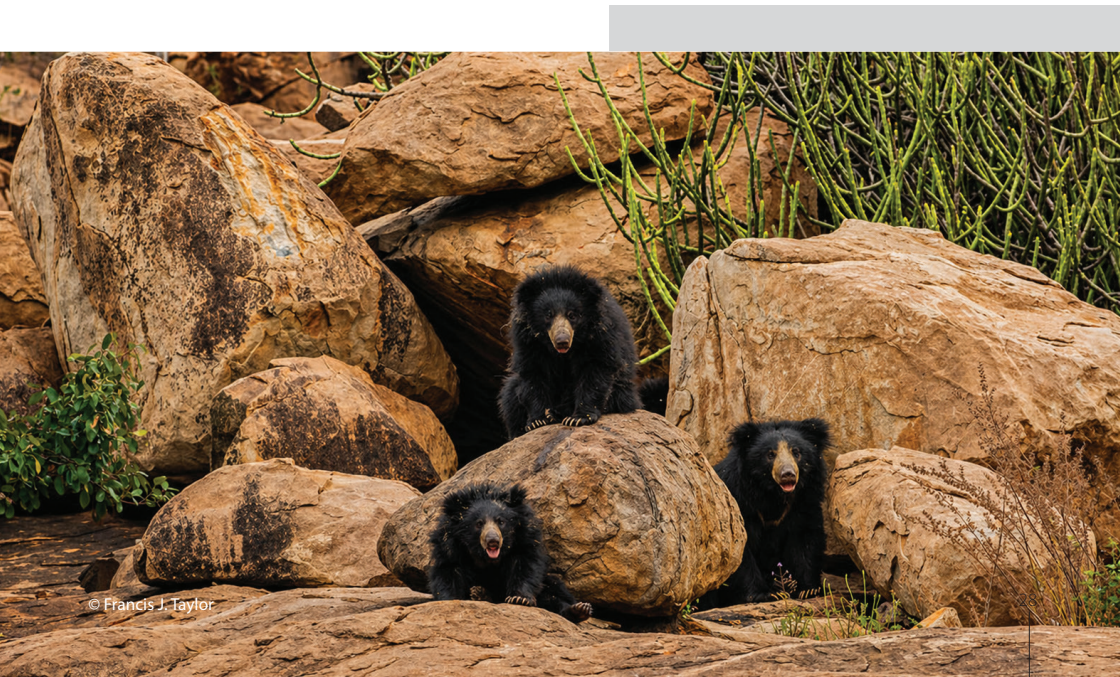
Potential management measures to address key challenges:

1. Medicinal plant conservation and RET (Rare, Endangered, Threatened) status assessment

Despite efforts toward medicinal plant conservation, many species are on the verge of extinction, with rapidly declining populations. The Foundation for Revitalisation of Local Health Traditions (FRLHT) has assigned RET status to 72 species in Sandur, adjacent town to Daroji. These classifications range from Extinct to Least Concern categories. The RET status was determined through two Conservation Assessment and Management Plan exercises conducted by FRLHT under the aegis of IUCN in Bangalore during February 1995 and 1996. The criteria for threat assessment are primarily based on habitat loss and indiscriminate harvesting.

2. Sustaining vigilance against illegal wildlife capture

The traditional practice of capturing Sloth Bear cubs for domestication by *Kalandar* communities has been effectively curtailed due to legal enforcement and conservation interventions. While this is no longer a prevalent threat, continued monitoring and awareness remain important to prevent any illegal incidents.



3. Restoration of scrub habitats

Given that scrublands are the most affected land-use class, active restoration using native deciduous and xerophytic species should be prioritised in degraded buffer areas. Assisted natural regeneration can be an effective low-cost approach in semi-arid ecosystems.

4. Establishment of stepping habitats for facilitating movement

Strengthening connectivity between Daroji and nearby landscapes, such as Gudekote and nearby forest patches is crucial. Identifying and restoring micro-corridors will facilitate bear movement on a larger scale and reduce isolation of sub-populations.

5. Human-bear conflict mitigation measures

Promote crop protection strategies, such as solar fencing, early-warning systems and community-based monitoring. Compensation schemes should be timely and transparent to maintain local support for conservation.

6. Invasive species management

Systematic removal or control of invasive plant species, such as *Prosopis juliflora* should be undertaken, followed by restoration with native vegetation to improve habitat quality and forage availability.

7. Fire management and prevention strategies

Develop community-based fire management plans, including fire lines, early detection systems and awareness programs to reduce anthropogenic fire incidences in dry seasons.

8. Regulation and monitoring of mining activities

Strict enforcement of environmental regulations around mining zones is critical. Regular monitoring using remote sensing should be implemented to track habitat degradation and ensure compliance with restoration mandates.

9. Long-term ecological monitoring and research

Establish permanent monitoring plots and integrate technology with field surveys to track changes in vegetation, prey availability and bear habitat use. This will help in the adaptive management of the sanctuary.

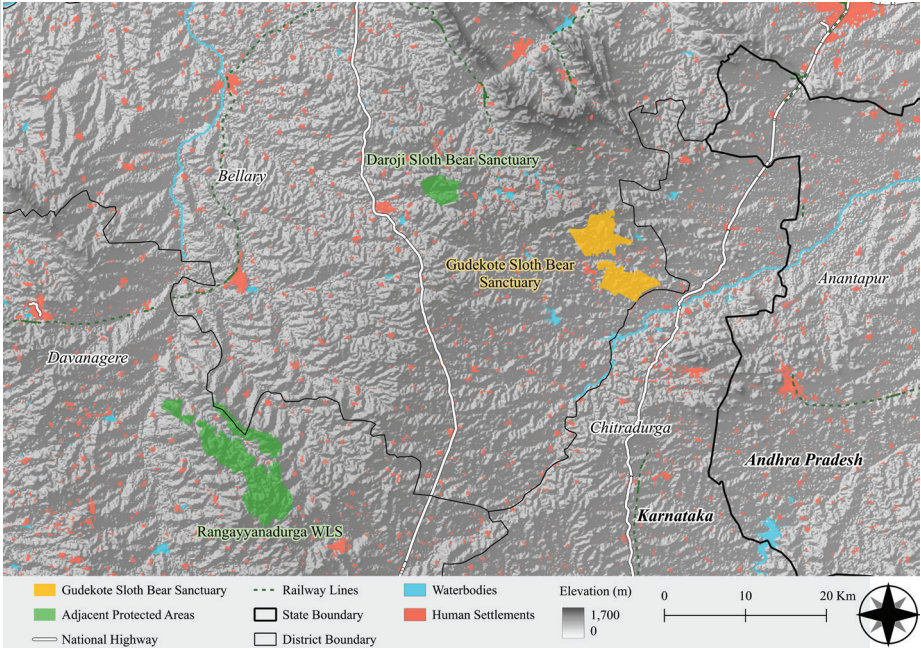
10. Community-based livelihood diversification

Reduce dependency on forest resources by promoting alternative livelihoods, such as eco-tourism, value addition of non-timber forest products and skill-based employment programmes.

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Gudekote Sloth Bear Sanctuary



Map depicting the Gudekote Sloth Bear Sanctuary located along the Karnataka-Andhra Pradesh boundary, showing adjacent protected areas important for potential dispersal (eg., the Daroji Sloth Bear Sanctuary and the Rangayyanadurga Wildlife Sanctuary), along with settlements, major drainage networks and topography

Area: 167.66 km² (14.87293° N 76.63434° E)

District: Ballari (Karnataka)

Habitat: Southern tropical dry deciduous forest and Desert thorn forest (Champion & Seth, 1968; types 5A & 6B)

Terrain: Hilly and undulating with boulders and rock dens

Key flora: *Cassia fistula* (Amaltas), *Aegle marmelos* (Bel), *Acacia senegal* (Gum Babool), *Butea monosperma* (Palash), *Zizyphus mauritiana* (Ber), *Acacia nilotica* (Desi Babool)

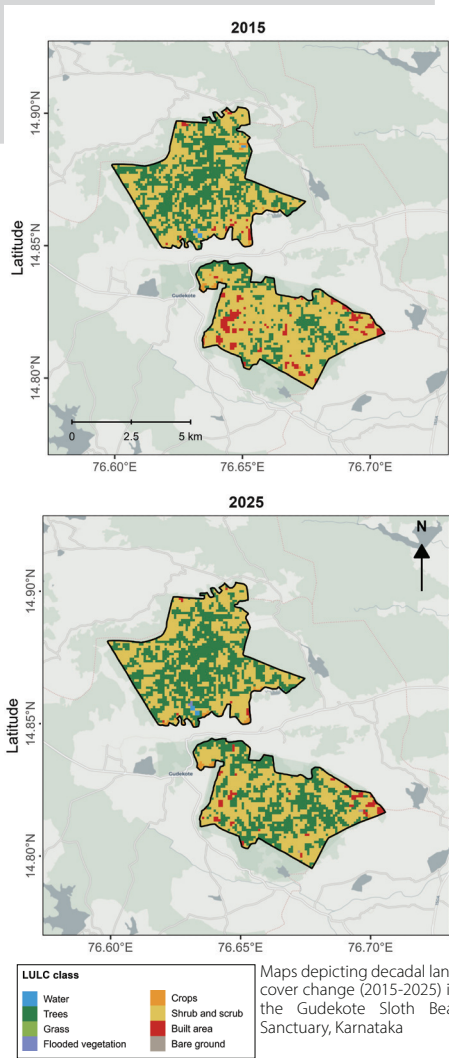
Key mammals: *Melursus ursinus* (Sloth Bear), *Panthera pardus* (Indian Leopard), *Hyaena hyaena* (Striped Hyena), *Manis crassicaudata* (Indian Pangolin), *Mellivora capensis* (Honey Badger)

Key birds: *Picus xanthopygaeus* (Streak-throated Woodpecker), *Falco peregrinus* (Peregrine Falcon), *Caprimulgus indicus* (Indian Jungle Nightjar), *Otus bakkamoena* (Indian Scops-Owl), *Nisaetus cirrhatus* (Changeable Hawk-Eagle), *Platalea leucorodia* (Eurasian Spoonbill), *Dicrurus macrocerus* (Black Drongo), *Dendrocygna javanica* (Lesser Whistling Duck), *Ciconia episcopus* (Asian Woolly-necked Stork), *Glauclidium radiatum* (Jungle Owlet), *Ficedula albicilla* (Taiga Flycatcher), *Euodice malabarica* (Indian Silverbill).

Adjacent protected areas with Sloth Bears (possible corridor connectivity): Daroji-Gudekote and Gudekote-Rangayyanadurga Wildlife Sanctuaries

Gazette notification: July 2017 (Notification no. SO-2145(E) dated 06th July 2017)

Change in land cover

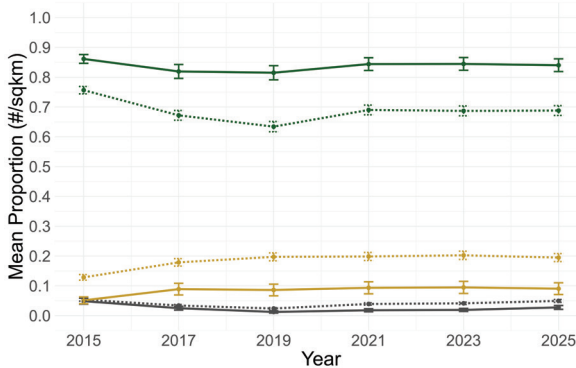


The decadal land cover change analysis for the Gudekote Sloth Bear Sanctuary highlights a highly fragmented and human-dominated landscape structure, similar to Daroji. Gudekote consists of two spatially distinct and disconnected areas separated by human-modified land uses, resulting in a fragmented boundary surrounded by roads, settlements and agricultural land. This fragmentation is a defining characteristic of the sanctuary and strongly influences habitat quality and connectivity. The landscape is largely dominated by scrub and shrub vegetation, interspersed with patches of tree cover. However, these scrub habitats have shown a declining trend over the decade, likely due to gradual conversion into croplands, particularly along the sanctuary edges. In the southern extent, some localised gains in tree cover are evident within central areas.

Temporal trends indicate that the core forest area has remained relatively stable, with a slight decline during the early years of the decade followed by recovery in subsequent years. In contrast, the buffer exhibits more pronounced changes. Forest cover in the buffer declined substantially from approximately 76% in 2015 to around 64% by 2019, with only partial recovery to approximately 70% by 2025. Concurrently, cropland expanded notably between 2017 and 2019 and has remained consistently high. Additionally, human settlements have shown a gradual increase over the past 5-6 years, contributing to fragmentation and edge effects.



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Land Use → Built up → Cropland → Forest **Zone** --- Buffer — Core

Change in proportional land cover (mean±SE /km²) from 2015 to 2025 in the Gudekote Sloth Bear Sanctuary, Karnataka

Gudekote represents a landscape with a relatively stable core within an increasingly modified and fragmented landscape. The combined effects of scrub loss, agricultural expansion and infrastructural pressures underscore the need for targeted conservation interventions focusing on habitat connectivity, edge management and restoration of degraded scrub ecosystems.

Local communities and their dependence: *Nayaka/Naik/Nayak, Beda/Bedar, Valmiki, Konda Kapu, Chodhara*. Local communities are mostly dependent on agriculture and livestock rearing.



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Conservation challenges:

1. Habitat fragmentation and loss of connectivity

The sanctuary is fragmented into two disjunct habitat patches separated by a human-dominated matrix. This structural discontinuity restricts movement and weakens connectivity with adjoining areas, such as Daroji Sloth Bear Sanctuary and adjacent reserve forests. Over time, reduced dispersal and gene flow may increase the risk of population isolation in the overall landscape. Fragmentation can increase edge areas and force wildlife into closer proximity with human-use areas, leading to more frequent encounters.

2. Decline and degradation of scrub habitats

Scrub habitats largely dominating Gudekote landscape are declining due to gradual land cover conversion into croplands and increased human use. These habitats are critical for sustaining Sloth Bear populations within their habitats. Their degradation reduces habitat quality and directly affects resource availability.

3. Human-bear interface

Close proximity of agricultural fields and settlements to forest patches increases the likelihood of human-bear interactions. Crop foraging and accidental encounters often lead to injuries or retaliatory actions. Expansion of croplands and settlements in buffer areas intensifies these conflicts and adds anthropogenic pressures on the habitat.

4. Edge effects and habitat disturbance

The perforated boundaries of the sanctuary expose large areas to edge effects with human-associated land covers and promote grazing, firewood collection and human intrusion. These disturbances degrade habitat quality and affect key features for space use by bears. Increased edge exposure also alters natural habitat structure and ecological processes.

5. Inadequate monitoring and knowledge gaps

There is a lack of standardised, long-term monitoring of Sloth Bear populations and habitat use patterns in the sanctuary. Most available information is based on indirect or sporadic observations, limiting understanding of population trends and seasonal space use patterns, which constrains evidence-based conservation planning.

Potential management measures to address key challenges:

1. Strengthening connectivity and landscape planning

Restoring and securing corridor linkages between Gudekote and surrounding forested landscapes is essential for maintaining ecological connectivity. Habitat restoration in intervening areas can facilitate movement and gene flow. Integrating conservation priorities into regional land-use planning will help reduce further fragmentation.

2. Scrub habitat restoration and protection

Scrub ecosystems should be recognised as critical habitats. Restoration using native species that support Sloth Bear foraging can improve habitat quality. Controlling and managing further conversion of scrub to agriculture is essential for sustaining long-term resource availability for Sloth Bears and associated species.

3. Conflict mitigation and community engagement

Reducing conflict requires a combination of awareness activities, early warning systems and community-based mitigation strategies. Promoting safe practices and improving crop protection can minimise human-bear encounters. Timely and transparent compensation mechanisms are crucial for maintaining local support.

4. Protection of denning sites and critical habitats

Rocky outcrops and dens require targeted protection from human-mediated disturbances. Mapping and monitoring these features can guide site-specific management. Seasonal protection measures are particularly important during breeding and cub-rearing seasons.

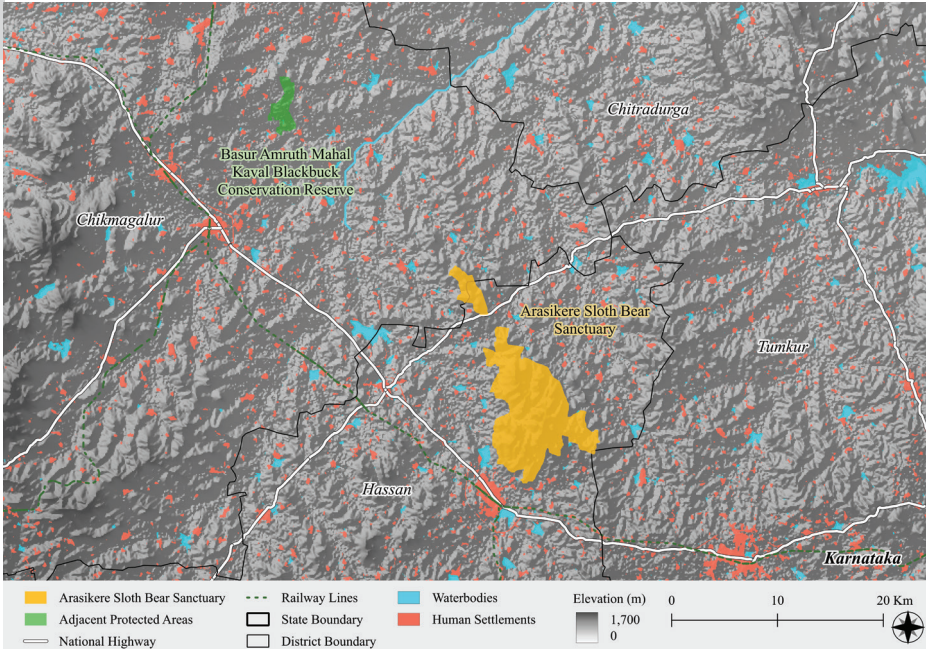
5. Strengthening monitoring and research

Implementing systematic monitoring using camera traps and genetic tools can generate robust population estimates. Long-term studies on movement and habitat use will support adaptive management. Improved data will enhance decision-making and conservation effectiveness.

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Arasikere Sloth Bear Sanctuary



Map depicting the Arasikere Sloth Bear Sanctuary located in Karnataka, showing adjacent protected areas (eg., the Basur Amruth Mahal Kaval Conservation Reserve), along with settlements, major drainage networks and topography

Area: 100.88 km² (13.38745° N 76.29968° E) comprising reserve forests of Hirekallugudda, Ramenahalli, Chakanakatte (Arasikere range) and two forest blocks from Gardangiri (Kadur range).

District: Hassan (Karnataka)

Habitat: Southern tropical dry deciduous forest and Desert thorn forest (Champion & Seth, 1968; types 5A & 6B); rugged granite hillocks (Hirekallugudda and Ramenahalli ranges) with natural caves and boulder fields; habitat type transitional between southern dry deciduous and southern thorn scrub.

Terrain: Rocky granite hills (Hirekallugudda means "large rocky hill"), and boulder interspersed with deciduous forest patches and open grasslands, terrain similar in character to Daroji and Gudekote but with slightly higher moisture availability.

Key flora: *Cassia fistula* (Amaltas), *Aegle marmelos* (Bel), *Acacia senegal* (Gum Babool), *Butea monosperma* (Palash), *Ziziphus mauritiana* (Ber), *Acacia nilotica* (Desi Babool).

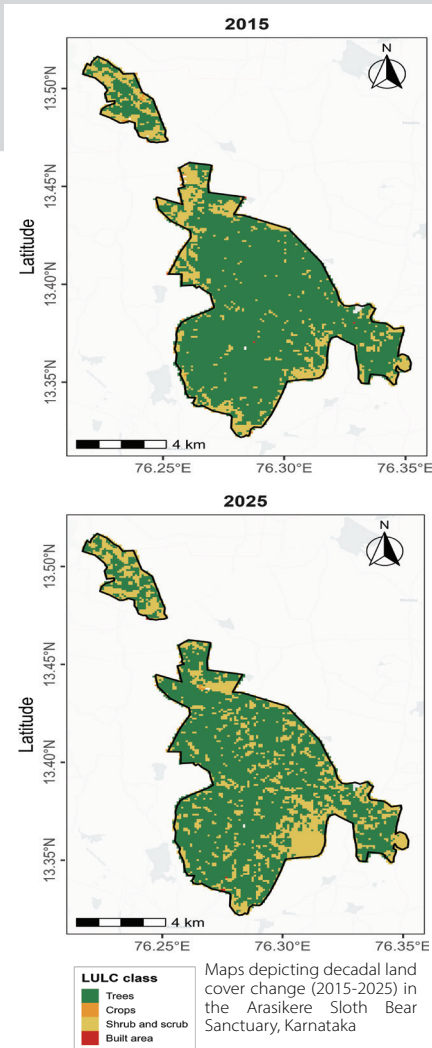
Key mammals: *Melursus ursinus* (Sloth Bear), *Panthera pardus* (Indian Leopard), *Hyaena hyaena* (Striped Hyena), *Manis crassicaudata* (Indian Pangolin), *Mellivora capensis* (Honey Badger).

Key birds: *Picus xanthopygaeus* (Streak-throated Woodpecker), *Falco peregrinus* (Peregrine Falcon), *Caprimulgus indicus* (Indian Jungle Nightjar), *Otus bakkamoena* (Indian Scops-Owl), *Leptocoma zeylonica* (Purple-Rumped Sunbird), *Platalea leucorodia* (Eurasian Spoonbill), *Dendrocygna javanica* (Lesser Whistling Duck), *Ciconia episcopus* (Asian Woolly-necked Stork), *Glaucidium radiatum* (Jungle Owlet), *Ficedula albicilla* (Taiga Flycatcher).

Adjacent protected areas with Sloth Bears (possible corridor connectivity): Bhadra Tiger Reserve (north-northeast via forested tracts of Hassan-Chikkamagaluru landscape), Sakleshpur forests (west), Gudekote Sloth Bear Sanctuary (northeast), broader Hassan-Chikkamagaluru forest landscape.

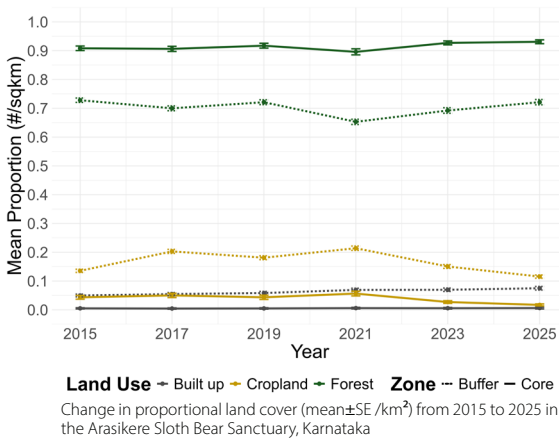
Gazette notification: September 2019 (Notification no. FEE/138/FWL/2022 dated the 31st December 2022)

Change in land cover



Land cover analyses over the past decade indicate a stable yet intensively human-modified landscape. Within the sanctuary, forest and scrub cover remains dominant (~90%), with minor proportions of cropland (~3-5%) and negligible built-up areas. In contrast, the surrounding landscape has a similar pattern to other protected areas, where mean forest cover is slightly lower than inside sanctuary. Croplands outside sanctuary constitute 15-20% proportion and ~65-75% area remains dominated by forest and scrubs, which allow Sloth Bears and associated species to move beyond such isolated protected areas.

Human settlements remain 5-10% distributed across the region. The spatial pattern reflects a fragmented mosaic where natural vegetation persists primarily within protected boundaries, while the external matrix is dominated by agriculture and settlements. These spatial patterns are characteristic of the dry deciduous and scrub forest ecosystems of southern India, where remnant forest patches are increasingly isolated within agrarian landscapes. Such systems are shaped by seasonal climatic variability and anthropogenic pressures, including agriculture expansion and infrastructure development. Although a slight decrease in cropland and slight increase in natural regeneration has been observed across the sanctuary and outside protected boundary.



The area outside the sanctuary showed ecological stability with increase in forest cover. In such dryland ecosystems, even small enhancements in woody vegetation and shrub cover can significantly improve habitat suitability by supporting food resources, eg., termites, fruits and denning opportunities for Sloth Bears. However, given fragmented matrix outside the sanctuary, long-term conservation will depend on improving functional connectivity and reducing anthropogenic pressures beyond the sanctuary boundaries.

Local communities and their dependence: Naikda, Nayaka, Cholivala Nayaka, Kapadia Nayaka, Mota Nayaka, Nana Nayaka, Naik, Nayak, Beda, Bedar, Valmiki. Local communities are mostly dependent on agriculture and livestock rearing.



Conservation challenges:

1. Habitat fragmentation and connectivity loss

The sanctuary comprises multiple non-contiguous reserve forest blocks, resulting in a fragmented landscape. Connectivity with adjoining forest tracts of the Hassan-Chikkamagaluru landscape and towards the Bhadra Tiger Reserve remain weak, which restricts movement and reduces gene flow.

2. Habitat degradation

Livestock grazing within the sanctuary along with monoculture plantations in the surrounding has altered vegetation structure and reduced habitat quality. Invasive species, such as *Prosopis juliflora* and *Lantana camara* further suppress native flora and key food resources. These pressures collectively degrade foraging habitats and ecological integrity of Sloth Bear habitats.

3. Human disturbances

The presence of temples, road networks and increasing human uses contribute to continuous disturbance within and outside the sanctuary. Pilgrimage activities bring seasonal influxes of noise and waste. At the same time, gradual expansion of settlements and agriculture in buffer areas intensifies edge effects and increases likelihood of human-wildlife interactions.

4. Electrocutation risks

The growing interface between Sloth Bear habitats and agricultural landscapes increases interaction probabilities between bears and humans. Unregulated electric fencing around private croplands pose serious threats to local wildlife. Electrocutation has emerged as a significant and preventable source of bear mortality in the surrounding landscape.



5. Knowledge gaps and limited monitoring

There is a lack of systematic and long-term monitoring of Sloth Bear populations and habitat use in the sanctuary. Baseline information on biodiversity, including other mammals remains least explored. These gaps limit the ability to design targeted, evidence-based conservation strategies.

Potential management measures to address key challenges:

1. Strengthening connectivity and landscape planning

Efforts should focus on improving connectivity between Arasikere and adjoining forest landscapes through the restoration of degraded patches. Identifying and securing potential corridors will facilitate movement and gene flow. Integrating conservation priorities into regional land-use planning is essential to prevent further fragmentation.

2. Regulation of human activities

Restricting pilgrimage timings and regulating visitor movement within the sanctuary can reduce disturbance. Road impacts should be minimised through speed control, signage and limiting expansion in wildlife sensitive areas. Awareness programs can help promote responsible use of the landscape.

3. Conflict mitigation

Promoting wildlife-safe fencing practices and regulating electric fence use is critical in the surrounding agricultural areas. Regular maintenance of associated infrastructure can reduce electrocution incidents in the region. Community awareness and rapid response mechanisms can help mitigate conflict situations.

4. Research monitoring and community engagement

Establishing systematic monitoring using camera traps and genetic tools will improve the understanding of population status and trends. Strengthening nature education and involving local communities in conservation efforts can enhance stewardship. Integrating scientific research with local knowledge will support adaptive management.

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Annexure I. List of Protected Areas within Sloth Bear Distribution Range

State	Protected Area
Andhra Pradesh	Pakhai WS
Andhra Pradesh	Papikonda WS
Andhra Pradesh	Nagarjunasagar-Srisailem TR
Andhra Pradesh	Gundla Brahmeswaram WS
Andhra Pradesh	Kaundinya WS
Andhra Pradesh	Sri Venkateswara NP
Andhra Pradesh	Sri Lankamalleswara WS
Andhra Pradesh	Sri Penusila Narasimha WS
Arunachal Pradesh	Pakhui WS
Arunachal Pradesh	D'Ering WS
Assam	Kaziranga NP
Assam	Manas NP
Assam	Garampani WS
Assam	Nameri NP
Assam	North Karbi Anglong WS
Assam	Soni Rupai WS
Assam	Barnadi WS
Assam	Nambor WS
Assam	Nambor-Doigrung WS
Assam	East Karbi Anglong WS
Assam	Marat Longri WS
Assam	Barail WS
Bihar	Bhimbandh WS
Bihar	Valmiki NP & WS
Bihar	Kaimur WS
Bihar	Gautam Buddha WS
Bihar	Rajgir WS
Chhattisgarh	Achanakmar WS
Chhattisgarh	Badakhhol WS
Chhattisgarh	Barnawapara WS
Chhattisgarh	Bhairamgarh WS
Chhattisgarh	Bhoramdev WS
Chhattisgarh	Gomardha WS
Chhattisgarh	Guru Ghasi Das NP
Chhattisgarh	Indravati NP
Chhattisgarh	Kanger Ghati NP
Chhattisgarh	Pamed WS
Chhattisgarh	Semarsot WS
Chhattisgarh	Sitanadi WS
Chhattisgarh	Tamoringla WS
Chhattisgarh	Udanti WS
Goa	Cotigao WS
Goa	Netravali WS
Goa	Mhadei WS
Goa	Bondla WS
Goa	Bhagwan Mahavir WS
Goa	Mollem NP & WS
Gujarat	Shoolpaneshwar WS
Gujarat	Jambughoda WS
Gujarat	Ratanmahal WS
Gujarat	Jessore WS
Gujarat	Balaram Ambaji WS
Jharkhand	Palamau WS
Jharkhand	Betla NP
Jharkhand	Lawalong WS
Jharkhand	Dalma WS
Jharkhand	Gautam Buddha WS

Jharkhand	Hazaribagh WS
Jharkhand	Koderma WS
Jharkhand	Palkot WS
Jharkhand	Topchanchi WS
Karnataka	Adichunchanagiri WS
Karnataka	Anshi NP
Karnataka	Arabithittu WS
Karnataka	Bandipur NP
Karnataka	Bannerghatta NP
Karnataka	Bhadra WS
Karnataka	Biligiri Rangaswamy Temple WS
Karnataka	Brahmagiri WS
Karnataka	Dandeli WS
Karnataka	Darjig WS
Karnataka	Kudremukh NP
Karnataka	Melkote Temple WS
Karnataka	Mookambika WS
Karnataka	Nugu WS
Karnataka	Nagarahole NP
Karnataka	Sharavathi Valley WS
Karnataka	Cauvery WS
Karnataka	Bhimgad WS
Karnataka	Arasikere WS
Karnataka	Gudekote WS
Karnataka	Malai Mahadeshwara WS
Karnataka	Pushpagiri WS
Karnataka	Rangayyanadurga WS
Karnataka	Talakaveri WS
Karnataka	Shettihalli WS
Karnataka	Someswara WS
Kerala	Chendurung WS
Kerala	Chimmony WS
Kerala	Chinnar WS
Kerala	Eravikulam NP
Kerala	Idukki WS
Kerala	Neyyar WS
Kerala	Mathikettan Shola NP
Kerala	Kurinjimala WS
Kerala	Parambikulam WS
Kerala	Peppara WS
Kerala	Periyar NP & WS
Kerala	Silent Valley NP
Kerala	Pambadum Shola NP
Kerala	Malabar WS
Kerala	Anamudi Shola WS
Kerala	Aralam WS
Kerala	Kottiyoor WS
Kerala	Peechi-Vazhani WS
Kerala	Wayanad WS
Madhya Pradesh	Bagdara WS
Madhya Pradesh	Bandhavgarh NP
Madhya Pradesh	Bori WS
Madhya Pradesh	Fossil NP
Madhya Pradesh	Kanha NP
Madhya Pradesh	Kheoni WS
Madhya Pradesh	Kuno NP
Madhya Pradesh	Panna NP
Madhya Pradesh	Ghatigaon WS

Madhya Pradesh	Gandhi Sagar WS
Madhya Pradesh	Madhav NP
Madhya Pradesh	National Chambal WS
Madhya Pradesh	Noradehi WS
Madhya Pradesh	Pachmarhi WS
Madhya Pradesh	Palpur Kuno WS
Madhya Pradesh	Panpatha WS
Madhya Pradesh	Pench NP & WS
Madhya Pradesh	Phen WS
Madhya Pradesh	Ratapani WS
Madhya Pradesh	Sanjay NP
Madhya Pradesh	Sardarpur WS
Madhya Pradesh	Satpura NP
Madhya Pradesh	Singhori WS
Madhya Pradesh	Rani Durgavati WS
Maharashtra	Andhari WS
Maharashtra	Bhamragarh WS
Maharashtra	Bor WS
Maharashtra	Chandoli WS
Maharashtra	Chaprala WS
Maharashtra	Gautala WS
Maharashtra	Gugamal NP
Maharashtra	Katepurna WS
Maharashtra	Melghat WS
Maharashtra	Nagzira WS
Maharashtra	Nawegaon NP
Maharashtra	Painganga WS
Maharashtra	Pench NP
Maharashtra	Tadoba NP
Maharashtra	Wan WS
Maharashtra	Bhimashankar WS
Maharashtra	Kalsubai WS
Maharashtra	Koyna WS
Maharashtra	Radhanagari WS
Maharashtra	Tipeshwar WS
Maharashtra	Yawal WS
Mizoram	Dampa WS
Odisha	Baisipalli WS
Odisha	Chandak Dampara WS
Odisha	Karlapat WS
Odisha	Khalasuni WS
Odisha	Kotagarh WS
Odisha	Kuldiha WS
Odisha	Satkosia Gorge WS
Odisha	Debrigarh WS
Odisha	Kapilash WS
Odisha	Badarma WS
Odisha	Lakhari Valley WS
Odisha	Simlipal NP
Rajasthan	Bandh Baretha WS
Rajasthan	Bassi WS
Rajasthan	Bhensrodgarh WS
Rajasthan	Darrah WS
Rajasthan	Jawahar Sagar WS
Rajasthan	Kela Devi WS
Rajasthan	Kumbhalgarh WS
Rajasthan	Mount Abu WS

Rajasthan	National Chambal WS
Rajasthan	Phulwari Ki Nai WS
Rajasthan	Ramgarh Vishdhari WS
Rajasthan	Ranthambhore NP
Rajasthan	Sariska NP
Rajasthan	Sawai Man Singh WS
Rajasthan	Jaisamand WS
Rajasthan	Sajjargarh WS
Rajasthan	Jawai Leopard CR
Rajasthan	Sundhamata CR
Rajasthan	Todgarh-Raoli WS
Rajasthan	Van Vihar WS
Tamil Nadu	Indira Gandhi (Annamalai) NP
Tamil Nadu	Sathyamangalam WS
Tamil Nadu	Kalakkad WS
Tamil Nadu	Kanyakumari WS
Tamil Nadu	Mudumalai NP & WS
Tamil Nadu	Kalakkad Mundanthurai TR
Tamil Nadu	Meghamalai WS
Tamil Nadu	Srivilliputhur WS
Telangana	Kawal WS
Telangana	Pranahita WS
Telangana	Sivaram WS
Telangana	Pocharam WS
Telangana	Kinnerasani WS
Uttarakhand	Corbett NP
Uttarakhand	Rajaji NP
Uttarakhand	Sonanadi WS
Uttar Pradesh	Chandraprabha WS
Uttar Pradesh	Dudhwa NP
Uttar Pradesh	Katerniaghat WS
Uttar Pradesh	Kishanpur WS
Uttar Pradesh	National Chambal WS
Uttar Pradesh	Ranipur WS
Uttar Pradesh	Sohagi Barwa WS
Uttar Pradesh	Sohelwa WS
Uttar Pradesh	Kaimur WS
Uttar Pradesh	Mahavir Swami WS
West Bengal	Buxa NP & WS
West Bengal	Gorumara NP
West Bengal	Jaldapa NP

Note: The list of Protected Areas within Sloth Bear distribution range is subject to periodic updates and may be revised as new research becomes available.

Abbreviations: NP-National Park; WS-Wildlife Sanctuary; TR- Tiger Reserve; CR-Conservation Reserve.

Sources: National Bear Conservation and Welfare Action Plan (2012) & IUCN Red List Assessment (2020)



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