WILDLIFE PROTECTION IN BHOPAL: FOCUS ON URBAN TIGERS, THEIR CONSERVATION & STRATEGIES

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ABSTRACT

This research paper examines the complexities of wildlife protection and tiger conservation in urban Bhopal, Madhya Pradesh, with a particular focus on the phenomenon of "urban tigers"—individuals that have adapted to the city's fringes. Through an interdisciplinary, qualitative methodology integrating field observations, stakeholder interviews, and legal-document analysis, the study explores the dynamic interactions between urban expansion, tiger populations, community involvement, and the effectiveness of current conservation strategies. Key habitats such as Van Vihar National Park and the newly designated Ratapani Tiger Reserve are highlighted as biodiversity hotspots under increasing pressure from real estate development, infrastructure projects, habitat fragmentation, and human-wildlife conflict. The paper examines significant challenges, including the fragmentation of habitats, weakening of wildlife corridors, and the rise in vehicle-wildlife collisions, while underscoring innovative interventions like technology-driven wildlife monitoring, village relocations, buffer zone creation, and community-based conservation efforts led by government and NGOs. Special attention is given to the critical role of the National Green Tribunal (NGT) in regional environmental governance, analysing how legal frameworks—despite jurisdictional limitations—can advance ecological justice. Case studies of NGT interventions illuminate the tribunal's practical significance in addressing threats from illegal mining, pollution, and weak enforcement. The paper concludes with actionable recommendations, such as expanding NGT jurisdiction, enhancing inter-agency coordination, leveraging technological tools like GPS collars and drones, empowering local communities, and strengthening public awareness. Ultimately, it advocates for a synergistic model integrating law, science, and community participation to balance urban development with ecological preservation, positioning Bhopal as a testing ground for sustainable coexistence between large carnivores and an urbanising human society.

INTRODUCTION

Urban Biodiversity and Tiger Conservation in Bhopal

Bhopal, the capital of Madhya Pradesh, is often referred to as the "City of Lakes," but beyond its picturesque waters and architectural heritage, it is also an emerging symbol of **urban biodiversity** and ecological resilience. Nestled amid the Vindhyan hills, Bhopal's ecological landscape encompasses diverse ecosystems that support a broad array of **fauna and flora**, making it a key player in central India's conservation narrative.

Ecological Zones and Wildlife Presence

Bhopal hosts a network of urban and peri-urban green zones, including **Van Vihar National Park**, the **Upper Lake (Bhojtal) catchment**, **Kerwa**, and **Kaliasot forests**. These areas, though situated close to densely populated urban settlements, remain biologically rich. They serve as critical habitats for various species such as **tigers (Panthera tigris)**, **leopards (Panthera pardus)**, **sloth bears (Melursus ursinus)**, **hyenas (Hyaena hyaena)**, **jackals (Canis aureus)**, **wild boars (Sus scrofa)**, and a wide range of **birds, reptiles, and aquatic species**.[1]

The **Ratapani Wildlife Sanctuary**, located just 35 km from the city, was officially declared the **Ratapani Tiger Reserve in 2024**, adding momentum to conservation efforts in the region.[2] The forests of Kerwa, Kaliasot, and Ratapani are interconnected through degraded corridors, which, despite fragmentation, continue to support the movement and genetic flow of wild animals, especially large carnivores like tigers and leopards.

Urban Tigers: Adaptation at the Edge

An emerging conservation phenomenon in Bhopal is the presence of **urban tigers** — individual tigers that have adapted to living on the periphery of the city, especially in forest patches like **Kerwa, Kaliasot, and Sehore divisions**. These tigers, many of them sub-adults dispersing from core reserves like Ratapani or even Satpura, use **urban-fringe habitats** as

[1] Van Vihar National Park and the Upper Lake catchment area are known hotspots for avian diversity and small carnivore sightings (WWF-India, 2023).
[2]Ratapani's upgradation to a tiger reserve was approved in 2024, following two decades of advocacy (MoEFCC, 2024).

temporary or semi-permanent territories due to shrinking forest cover elsewhere.[3]

While this highlights the **adaptive behaviour of tigers**, it also poses serious risks. Habitat fragmentation due to **real estate development, highway expansion (such as the Bhopal-Indore Expressway), and deforestation** has led to an increase in **man-animal conflicts**. Instances of **livestock killings, human injuries, tiger roadkills, and forest-human interface tensions** have become more frequent.[4] With Bhopal's population steadily rising, the ecological pressure on its green spaces has intensified, and **ecological buffers** around forest patches have drastically shrunk.

This phenomenon calls for an urgent recalibration of conservation strategies that go beyond traditional reserve-centric approaches. The presence of urban tigers demands integrative landscape-level planning that harmonises urban development with ecological sustainability. Establishing functional wildlife corridors, enforcing stricter controls on land-use change in buffer zones, and promoting coexistence through community awareness and compensation mechanisms are vital. Moreover, the role of local governance, urban planners, and environmental impact assessments becomes crucial in mitigating conflict and ensuring the long-term survival of these apex predators on the city's edge. As Bhopal continues to urbanise, these "borderland tigers" serve as a litmus test for how India's cities will adapt to – or push out – the wild within.

Key Challenges to Conservation in Bhopal

The major ecological challenges facing Bhopal's wildlife and forest ecosystems include:

- **Habitat Fragmentation**: Construction projects, real estate sprawl, and infrastructure expansion divide contiguous forests into isolated patches.

- **Encroachment & Urban Pressure**: Settlements on forest fringes, illegal grazing, and deforestation disrupt wildlife behaviour and movement.

[3] Athreya et al. (2013) note that dispersing tigers often adapt to edge habitats when core reserves are saturated or fragmented.
[4] Data from MP Forest Department (2023) recorded at least four tiger-related vehicular accidents within the Bhopal-Kaliasot zone.

- **Conflict & Casualties**: The rise in vehicle-wildlife collisions and accidental deaths of species like leopards and tigers is a growing concern.[5]

- **Weak Corridor Connectivity**: Natural corridors linking Ratapani, Sehore, and Bhopal are narrowing due to farmland and urban infrastructure.

- **Lack of Awareness**: Urban residents often lack awareness or tolerance toward wildlife, leading to fear-driven responses and hostility.

Conservation Strategies and Innovative Interventions

Despite the complex challenges, **Bhopal has emerged as a promising case study in urban-centric conservation**. The **Madhya Pradesh Forest Department**, in partnership with **non-governmental organisations (NGOs)** such as **Wildlife Conservation Trust (WCT)** and **WWF-India**, has implemented a range of strategies aimed at balancing urban development and ecological preservation:

1. **Village Relocation**: Critical efforts have been made to relocate villages from wildlife-rich zones within Ratapani and Sehore, minimising human-wildlife interface and restoring habitats.[6]

2. **Technology-Driven Monitoring**: Forest officials use **camera traps, GPS collars, and drone surveillance** to track tiger movements and respond proactively to conflicts.

3. **Ecological Restoration**: Plantation drives, wetland protection, and afforestation programs have aimed to rejuvenate degraded forest areas.

4. **Buffer Zone Creation**: Efforts are being made to establish buffer zones and community forests where human activities can coexist with ecological safety.

5. **Community Engagement & Education**: Environmental awareness campaigns in schools,

[5] The Bhopal Newsline (2024) reported increasing incidents of human injuries and leopard sightings in urban residential areas.
[6] WCT (2022) documented the relocation of multiple villages from core zones of Ratapani under its community-led conservation model.

colleges, and local communities foster coexistence.[7]

These actions are not only mitigating conflicts but also **redefining conservation in an urban framework**, where human and wildlife populations must coexist in increasingly shared spaces.

Bhopal's Model of Urban Wildlife Coexistence

Bhopal's example illustrates a unique and evolving conservation landscape. It shows that **urbanisation and wildlife conservation are not necessarily opposing forces**—with the right governance, technology, and community support, they can be aligned. The presence of tigers near a state capital might seem improbable, but in Bhopal, it is a lived reality. However, the sustainability of this model depends on continued investment in **corridor protection, conflict mitigation, rapid response teams, and education**.

METHODOLOGY

This report employs a comprehensive, interdisciplinary research methodology to investigate wildlife conservation in Bhopal, with a specific focus on urban tiger behaviour, human-wildlife conflict, and associated conservation strategies within a rapidly urbanising environment.

1. Research Design

This study adopts a qualitative, interdisciplinary research design. It integrates field-based observations, secondary data analysis, and insights from various stakeholders to explore the ecological, legal, and social complexities of wildlife conservation in Bhopal. The core objective is to understand the dynamic interactions between urban development, tiger populations, and human communities, as well as the effectiveness of current conservation approaches. The report further incorporates an urban ecology lens to frame the presence of apex predators, such as tigers, within city-edge ecosystems.

2. Data Collection Methods

A. Secondary Research

Extensive desk research was conducted to gather comprehensive information from a variety of

[7] Forest officials partnered with schools in Bhopal to roll out "Tiger Talks" and eco-club activities as part of awareness programs (MPFD, 2023).

authoritative sources. This included a systematic review of:

- **Government Reports and Official Notifications**: Relevant documents such as the Ratapani Tiger Reserve notification (2024)[8] and conservation plans from the Madhya Pradesh Forest Department (MPFD)[9] were examined.

- **Legal Judgments and Case Orders**: Decisions from the National Green Tribunal (NGT) were analysed, particularly those pertaining to environmental violations and wildlife protection within Madhya Pradesh[10][11].

- **Scholarly Articles, Journals, and Ecological Studies**: Academic literature focusing on tiger ecology, urban wildlife, and human-wildlife conflict provided foundational knowledge and theoretical perspectives[12][13][14]

- **Reports by Non-Governmental Organisations (NGOs)**: Publications from organisations such as the Wildlife Conservation Trust (WCT)[15] and WWF-India[16] were reviewed for insights into community-based conservation initiatives and technological interventions.

- **News Archives**: Recent news reports detailing tiger sightings, conflict incidents, and conservation efforts in and around Bhopal were consulted to capture contemporary developments and challenges[17][18].

B. Field Observations and Informal Interviews

During the internship period, direct field observations were conducted to gain practical, on-ground insights. These observations were made in key areas, including:

[8] Ministry of Environment, Forest and Climate Change. (2024). Ratapani notified as Tiger Reserve.
[9] Madhya Pradesh Forest Department 2023
[10] State Wildlife Action Plan.
[11] The Hindu. 2014
[12] Green Tribunal's powers to deal with wildlife cases challenged.
[13] Wikramanayake, E., Dinerstein, E., et al. (2006). Setting priorities for tiger conservation. *ScienceDirect*.
[14] Walston, J., et al. (2010). A landscape-based conservation strategy to double the wild tiger population. *Conservation Letters*.
[15] Tilson, R., & Nyhus, P. J. (2010). Saving wild tigers: A case study in biodiversity loss. *BioScience*.
[16] Wildlife Conservation Trust. (2022). Protecting Madhya Pradesh.
[17] WWF-India. (2023). Urban Wildlife and Wetland Protection in Bhopal.
[18] Wildlife rescue centers to be set up across MP.

- **Van Vihar National Park**
- **Kerwa and Kaliasot Forest Patches**
- **Fringe Villages near Ratapani Tiger Reserve**

These field visits facilitated a firsthand understanding of habitat conditions, signs of wildlife presence, the impact of infrastructure intrusions, and observed interactions between local communities and forest staff. Additionally, informal interviews were conducted with:

- **Forest Guards and Officials of the Madhya Pradesh Forest Department**
- **Local Villagers Living Near Forest Fringes**
- **NGO Volunteers Involved in Relocation and Awareness Programs**[19]

3. Case Study Analysis

Selected legal cases brought before the National Green Tribunal (NGT) and other judicial forums were analysed to understand their implications for wildlife conservation in urban contexts. This analysis aimed to:

- Understand how wildlife protection laws are interpreted and applied in urban environments.[20]
- Examine the application of environmental governance mechanisms within the Bhopal landscape.[21]
- Highlight the legal relevance of proactive conservation strategies versus reactive conflict management.[22]

[19] Madhya Pradesh Forest Department, *Annual Report 2022-2023*, Government of Madhya Pradesh, Forest Department Publications.
[20]The Wildlife (Protection) Act, 1972; National Green Tribunal Act, 2010.
[21] Ministry of Environment, Forest and Climate Change (MoEFCC), *National Wildlife Action Plan (2017–2031)*.
[22] Cullet, P. (2016). Environmental Law and Development, Oxford University Press.

Key NGT cases relevant to this study include: *Ashok Malik v. State of Rajasthan & Ors.*, *Pranjal Karera v. Union of India*, *Babulal Sahu v. State of Rajasthan & Ors.*, and *Nitin Saxena v. Ministry of Environment, Forest and Climate Change*.[23]

4. Analytical Framework

The report employs a multi-faceted analytical framework, drawing from several disciplines to provide a comprehensive understanding of the research topic:

- **Conservation Biology**: Used to assess the ecological impacts of habitat fragmentation and species adaptation in urbanised landscapes.[24]

- **Legal-Environmental Interface**: Evaluates the role of laws, policies, and tribunal interventions in shaping conservation outcomes.[25]

- **Socio-Spatial Analysis**: Examines human settlements, land-use changes, and the proximity factor in conflict zones.[26]

- **Urban Ecology**: Frames the presence and behavior of apex predators like tigers within city-edge ecosystems.[27]

5. Limitations

The following limitations are acknowledged:

- The report is based on limited-duration field visits, constrained by the internship's timeframe.[28]

- Primary data collection relied on informal interviews rather than structured surveys,

[23] Original Applications No. 78/2023, No. 64/2024, No. 91/2023, and No. 22/2025 respectively filed before the National Green Tribunal, Central Zone Bench, Bhopal.
[24] Primack, R. & Sher, A. (2016). An Introduction to Conservation Biology, Sinauer Associates.
[25]Divan, S. & Rosencranz, A. (2022). Environmental Law and Policy in India, Oxford University Press.
[26] Nagendra, H. (2010). Urbanization and ecosystems: A conceptual review, Ecological Indicators, 10(1), pp. 1–12.
[27] McDonnell, M. J., & Hahs, A. K. (2015). Adaptation of wildlife to urban ecosystems, Annual Review of Ecology, Evolution, and Systematics, 46, 261–280.
[28] Field Diary Notes (Internship period: 1st July – 21st July 2025), maintained by the author.

which may introduce biases or limit generalizability.[29]

- Access to certain wildlife movement data remains restricted due to confidentiality protocols within the forest department's monitoring programs.[30]

WILDLIFE CONSERVATION EFFORTS AND CHALLENGES IN BHOPAL

Bhopal, the capital of Madhya Pradesh, India, showcases a complex interplay between urban development and rich biodiversity, particularly within key habitats like Van Vihar National Park and Ratapani Wildlife Sanctuary. Van Vihar National Park, a unique combination of a national park, zoo, and rescue center, is situated adjacent to Bhopal's Upper Lake, a designated Ramsar Site, and plays a vital role as a carbon sink for the city.[31] This park supports a diverse array of flora, with at least 700 plant species, including prominent trees like Amaltas, Safed Babul, and Teak, alongside various grasses and creepers.[32] The park's varied landscape, featuring wetlands, meadows, rugged slopes, and bamboo vegetation, supports a rich floral and faunal diversity, housing free-ranging ungulates and captive carnivores.[33] Within its confines, carnivores like tigers, leopards, hyenas, and sloth bears, as well as herbivores such as nilgai, chital, and sambar, are maintained in large enclosures, highlighting its dual role in conservation and public education.[34]Van Vihar has also seen the addition of a butterfly park, featuring several species, and a snake park, further contributing to its biodiversity appeal.[35] The park is considered an excellent example of biodiversity improvement and eco-restoration on previously degraded land.[36] Furthermore, studies have documented a high diversity of macrozoobenthic life in the Upper Lake near Van Vihar, with 19 families recorded,[37] and a rich waterbird diversity, especially in the protected areas like Van Vihar National Park.[38] The park

[29] Bernard, H. R. (2017). Research Methods in Anthropology: Qualitative and Quantitative Approaches, Rowman & Littlefield.
[30] Wildlife Institute of India, Standard Operating Procedures for Tiger Monitoring, 2020.
[31] Van Vihar National Park & Zoo. (2025). https://vanviharnationalpark.org/
[32] A. Garg & Arjun Prasad Tiwari. (2019). Floristic Account of the Van Vihar National Park in Bhopal, Madhya Pradesh, India. Indian Journal of Forestry.
[33] S. JaiSwal & S.P. Singh. Economic Valuation of Eco-Tourism in Van Vihar National Park.
[34] S. A. Bhat et al. (2012). Food habits of Nilgai (Boselaphus tragocamelus) in Van Vihar National Park. Biomedical and Pharmacology Journal.
[35] Van Vihar National Park (2025) | Green Escape in Bhopal | MP Tourism. https://www.mptourism.com/van-vihar-national-park-bhopal.html
[36] Bhattacharya, A., Saksena, V., & Banerjee, S. (2006). Environmental Auditing in Ecotourism: A Study on Visitors 'Management in Van Vihar.
[37] Vyas, V., & Bhat, M.A. (2010). Macrozoobenthic diversity of tropical water body (Upper Lake) Bhopal. The Ecoscan.
[38] V. Vyas & H. Veerwal. (2014). Waterbird diversity at Upper Lake, Bhopal. Journal of Natural Sciences Research.

also contributes to research on local wildlife, such as studies on the food habits of nilgai and habitat utilization of chital and sambar, informing efforts to increase their populations through habitat extension and planting.[39][40]

Status of Urban Tigers and Other Wildlife

Bhopal is recognised as a unique urban environment where tigers coexist with humans, boasting one of the highest acceptance levels for big cats in any Indian city.[41] The Bhopal-Ratapani-Kheoni Landscape is home to approximately 96 tigers, with recent monitoring indicating the presence of three males, five females, and 17 cubs in an area less than 150 square kilometres connecting Bhopal and Ratapani Wildlife Sanctuary.[42] This unique situation has led to some tigers being termed "City Tigers," as they occasionally venture near the city's periphery. Six tigers have established territories within the Bhopal Municipal Corporation limits, with others, including nine cubs, roaming freely in the five-kilometre buffer area, remarkably without significant human-wildlife conflict reported thus far.[43] Despite skepticism from some wildlife authorities, a comprehensive dossier titled "A Case Study from the Urban Landscape of Bhopal" has been submitted, providing geo-locations and photographs to substantiate the presence of these urban tigers.[44] These urban tigers are known to explore residential areas and educational campuses, with sightings reported at Maulana Azad National Institute of Technology (MANIT) and Water and Land Management Institute (WALMI).[45] This close proximity to human settlements highlights the need for effective management and understanding of their movement patterns, with suggestions for radio-collaring to better monitor their spatiotemporal movements within the city.[46] The Ratapani Wildlife Sanctuary, located near Bhopal, serves as a crucial source population for these urban tigers, with

[39] M.A. Wani et al. (2011). Fecal Pellets used for the Determination of Habitat Utilization of Sambar in Van Vihar.
[40] K. Sheikh et al. (2011). Habitat Utilization of Chital in Van Vihar.
[41] Living with tigers in Bhopal - Times of India. (2023). https://timesofindia.indiatimes.com/city/bhopal/living-with-tigers-in-bhopal/articleshow/101249690.cms
[42] MM Verma & S. Nag. (2022). Tiger occupancy in Ratapani landscape: Why tigers are near Bhopal?
[43] Urban Tigers On The Prowl in Bhopal - The Wildlife India. (2022). https://www.thewildlifeindia.com/2022/10/Urban-Tigers-On-The-Prowl-In-Bhopal.html
[44] Urban Tigers In Bhopal Residential Areas – The Wildlife India. (2022). https://www.thewildlifeindia.com/2022/10/blog-post.html
1 Asia – Bhopal: A city where tigers thrive – BBC One. https://www.bbc.co.uk/programmes/articles/2F55hNNQCql2s0fZhH2Tdsp/bhopal-a-city-where-tigers-thrive
[46] Ratapani Tiger Reserve (2025) | MP Tourism. https://www.mptourism.com/ratapani-tiger-reserve-wilderness-near-bhopal.html

approximately 60 tigers inhabiting the sanctuary.[47] The sanctuary, which covers 825.90 sq km, is also home to a diverse array of wildlife, including leopards, sloth bears, spotted deer, sambar, wild dogs, hyenas, and over 150 species of birds, with teak forests covering 55% of its area.[48] The recent declaration of Ratapani as India's 57th tiger reserve and Madhya Pradesh's eighth is expected to significantly boost tiger conservation and tourism due to its proximity to Bhopal.[49]

Threats to Wildlife Conservation

Despite conservation efforts, Bhopal's wildlife faces several significant threats, including habitat loss, human-wildlife conflict, poaching, and infrastructure development. The rapid urbanization in India contributes to ecological devastation, and Bhopal, like other urban centers, experiences environmental stress due to development. The Kerwa-Kaliasot area, a prime tiger habitat connected to the Ratapani Wildlife Sanctuary, is under pressure from proposed development plans that would allow residential buildings, hotels, and offices, potentially leading to increased human-animal conflict.[50] Linear infrastructure, such as roads and railway lines, poses a serious threat by fragmenting habitats and ecological corridors, reducing landscape connectivity, and directly impacting wildlife through accidents and reduced access to essential resources.[51] For instance, a busy Delhi-Mumbai railway track passing through Ratapani has resulted in the deaths of at least seven tigers, 17 leopards, and one sloth bear since 2015 due to speeding trains, highlighting a critical safety concern.[52]

Human-wildlife conflict is also on the rise, particularly as tigers venture into villages to prey on livestock. While no major incidents of human-wildlife conflict have been reported in Bhopal's urban tiger areas, continued human encroachment into tiger habitats necessitates restrictive measures. The shrinking prey base in Ratapani, with herbivore density decreasing significantly from nine in 2018 to just two in 2024, forces tigers to seek prey outside protected

[47] Ratapani Wildlife Sanctuary – BirdLife DataZone. https://datazone.birdlife.org/site/factsheet/ratapani-wildlife-sanctuary
[48] A. Kumar et al. (2021). Butterflies of Ratapani Wildlife Sanctuary.
[49] SRIRAM's IAS. (2024). *Overview of the Ratapani Tiger Reserve*. https://x.com/sriramsrirangm/status/1864677904396751222
[50] Conservation Challenges at Ratapani Tiger Reserve. (2024). https://timesofindia.indiatimes.com/city/bhopal/conservation-challenges-at-ratapani-tiger-reserve-human-wildlife-conflicts-and-development-threats/articleshow/115946783.cms
[51] Forecasting effects of transport infrastructure on endangered tigers. (2022). https://pmc.ncbi.nlm.nih.gov/articles/PMC9121866
[52] Linear infrastructure and associated wildlife accidents create an ecological trap. (2024). https://www.sciencedirect.com/science/article/pii/S0048969724070918

areas, exacerbating conflict.[53] Poaching, particularly driven by the demand for "tiger bone glue," presents a significant threat to endangered species in central India. This illegal trade, extending to international syndicates in China and Vietnam, has led to a shocking number of tiger and leopard deaths.[54] The processing of tiger bone glue is shifting to source countries, complicating enforcement efforts. Additionally, the presence of villages within and around Ratapani Tiger Reserve, with residents dependent on forest resources, creates anthropogenic pressures like illegal tree felling, cattle grazing, and poaching of herbivores. The relocation of these villages is a major challenge for the management of the newly designated tiger reserve.[55]

Bhopal's unique position as a city where tigers roam freely alongside humans underscores the critical importance of robust conservation strategies. While Van Vihar National Park and Ratapani Wildlife Sanctuary serve as vital biodiversity hotspots and conservation pillars, they are simultaneously threatened by urban expansion, infrastructure development, human-wildlife conflict, and poaching. The recent elevation of Ratapani to a tiger reserve offers a promising outlook for enhanced conservation efforts, yet it necessitates comprehensive planning that addresses existing challenges such as railway-induced mortality and habitat fragmentation. Sustained political will, increased funding, community engagement, and the implementation of innovative solutions like radio-collaring are crucial for mitigating these threats. Ultimately, ensuring the long-term survival of Bhopal's diverse wildlife, especially its urban tigers, will depend on a delicate balance between urban development and ecological preservation, fostering harmonious coexistence between nature and human society.

CONSERVATION STRATEGIES IN BHOPAL:

A MULTI-FACETED APPROACH

The global tiger population, *Panthera tigris*, faces severe and multifaceted threats, particularly in increasingly human-dominated landscapes. Once widespread across Asia, wild tigers now persist in fragmented populations, occupying only about 7% of their historical range.[56] Urban

[53] MP govt approves ₹145-crore plan to curb human-tiger conflict. (2025). https://ddnews.gov.in/en/mp-govt-approves-%E2%82%B9145-crore-plan-to-curb-human-tiger-conflict
[54] "Bone glue" craze driving tiger poaching in central India. (2025). https://timesofindia.indiatimes.com/city/bhopal/bone-glue-craze-driving-tiger-poaching-in-central-india-mp-poacher-arrested/articleshow/118048644.cms
[55] Teething troubles or conservation challenges at India's latest tiger reserve. (2025). https://india.mongabay.com/2025/01/teething-troubles-or-conservation-challenges-at-indias-latest-tiger-reserve
[56] EW Sanderson et al. (2023). Range-wide trends in tiger conservation landscapes, 2001–2020.

expansion and development introduce significant challenges to tiger conservation, exacerbating issues such as habitat fragmentation, human-tiger conflict, infrastructure development, and illegal activities, all of which contribute to the decline of their prey base. A comprehensive understanding of these interconnected threats is crucial for devising effective conservation strategies that enable coexistence between humans and these apex predators.

Habitat Fragmentation and Corridor Disruption

Habitat fragmentation stands as a paramount challenge to tiger conservation, driven largely by rapidly expanding human populations and competing land uses.[57] This process breaks once continuous habitats into isolated patches, leading to increased competition for food and space, and elevating risks from disease outbreaks and episodic calamities like fires and floods. Over extended periods, species in isolated habitats also face extinction threats due to mechanisms such as excessive inbreeding.[58] For wide-ranging species like tigers, habitat fragmentation impedes their movement, reduces gene flow, and diminishes population connectivity, thereby threatening their long-term survival.[59]

Wildlife corridors are proposed as a solution to counteract the negative effects of habitat fragmentation by providing or rebuilding connectivity between isolated habitat patches.[60] These linear landscape elements facilitate animal dispersal, minimize genetic isolation, restore ecological processes, and reduce human-animal conflict. Despite their recognized importance, establishing and maintaining effective corridors is challenging due to large landscape requirements and the need to integrate various environmental factors such as habitat suitability, water availability, and human settlement density.[61] Moreover, high-traffic roads and densely populated urban areas severely impede tiger movement within their fragmented habitats, further disrupting these critical corridors.[62]Restoration efforts for corridors are vital, as highlighted by studies emphasizing the need to connect tiger populations in areas like India's Rajaji National Park to ensure recovery.[63]

[57] A. Harihar et al. (2009). Losing ground: Tigers in the north-western Shivalik.
[58]Disease threats to tigers and their prey - Frontiers (2023).
[59]JM Schoen et al. (2022). Synthesizing habitat connectivity.
[60]Robert C. Lozar et al. (2005). Use of the Corridor Tool.
[61] Hu Hua-bin (2008). Corridor design in China.
[62] G DUBOIS. ANNEX 1: Spatial analysis of linear infrastructure threats.
[63] Carmen George (2015). Wildlife Corridor for the Wild Tiger.

Human-Tiger Conflict Statistics

Human-tiger conflict (HTC) is a significant and escalating challenge for tiger conservation, arising primarily when tigers attack people or their livestock. This conflict often results in the loss of human lives and livelihoods, which in turn can foster negative attitudes towards tiger conservation and lead to retaliatory killings and poaching.[64] In recent decades, HTC has been prevalent in nearly all regions where tigers are present, with studies indicating a continuous increase in such incidents.[65] For instance, India has reported a significant number of fatal tiger attacks, with an average of 34 people killed annually between 2015 and 2018, and a staggering 111 human deaths reported in 2022–2023.[66] Similarly, in Nepal's Chitwan National Park and its buffer zone, 54 human casualties (32 fatalities, 22 injuries) and 351 livestock depredation incidents were recorded between 2007 and 2014, with human casualties showing a significant increase during this period.[67] The Sundarbans, a mangrove forest region, historically saw 50–60 human deaths per year due to tiger attacks, though this has reduced to about three annually due to improved wildlife management.[68]

The drivers of HTC include expanding human activities and livestock moving into forest areas, which increase the likelihood of encounters and make livestock an alternative food source for wild carnivores.[69] Tigers are more likely to prey on domestic animals in areas with limited natural prey.[70] A significant proportion of tiger attacks on people occur during accidental meetings, frequently when people are engaged in daily activities like collecting fodder or fuelwood, often in buffer zones near protected areas.[71] Spatiotemporal niche partitioning, which involves separating human and tiger activities in both time and space, has been proposed as a mitigation strategy to reduce conflict risk.[72] This includes strict reduction or prohibition of human activities in high-risk areas during peak tiger activity times, and promoting group activities during recommended periods in medium-risk areas.[73]

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[64] B. Gurung et al. (2008). Human-killing tigers in Chitwan.
[65] MJ Struebig et al. (2018). Human-tiger conflict using socio-ecological info.
[66] Data: Number of Humans Killed in Tiger Attacks - FACTLY (2024).
[67] Rajendra Dhungana et al. (2017). Living with tigers in Chitwan. [13] "Forest Means Fear": Tiger Attacks in Sundarbans (2023).
[68] Manjari Malviya & R. Krishnamurthy (2022).
[69] Thakur Silwal et al. (2016). [16] K. Baral et al. (2021).
[70] Drivers of human–tiger conflict risk and potential mitigation (2024).
[71] Priority Corridor Zone for HTC Mitigation.
[72] B Habib & A Saxena (2024). Linear infrastructure mitigation.
[73] Impacts of hydropower - Nature (2021).

Infrastructure Threats (Railways, Roads, Dams)

The rapid development of transport infrastructure, including roads, railways, and dams, poses a major threat to endangered species like tigers globally.[74] These linear infrastructures contribute significantly to habitat fragmentation, act as barriers to animal movement, and can lead to increased animal mortality through collisions with vehicles. The construction of roads and railways through tiger habitats results in ecosystem fragmentation, which is a major barrier to the rejuvenation of healthy tiger populations.[75]

Studies show that 134,000 km of roads already exist within tiger range, with an additional 24,000 km projected by 2050, many of which traverse protected areas and tiger reserves crucial for source populations.[76] For example, a model for Nepal's Chitwan National Park predicted that existing roads could kill 46 tigers over 20 years, reducing the adult tiger population by 39%.[77] The addition of a proposed railway further exacerbated this, directly killing 10 more tigers and reducing the population by an additional 30 individuals over the same period.[78] Road-induced mortality also decreased the proportion of time a tiger occupied a given site by five years in a 20-year simulation.[79] Moreover, transport infrastructure can deplete prey populations near roads and railways, further impacting tigers by reducing their food sources and potentially altering their movement patterns.[80] This depletion can paradoxically reduce tiger exposure to transportation-induced mortality as tigers shift away from areas with low prey abundance, but it carries significant ecological consequences for both prey and predators. Beyond roads and railways, hydroelectric dams also pose a substantial threat, having flooded significant portions of tiger habitats: 421 dams alone have impacted 13,750 km² of tiger habitat.[81] The projected expansion of hydropower infrastructure further amplifies these threats, stressing the urgent need for integrated conservation and infrastructure planning.[82]

Illegal Activities and Prey Base Decline

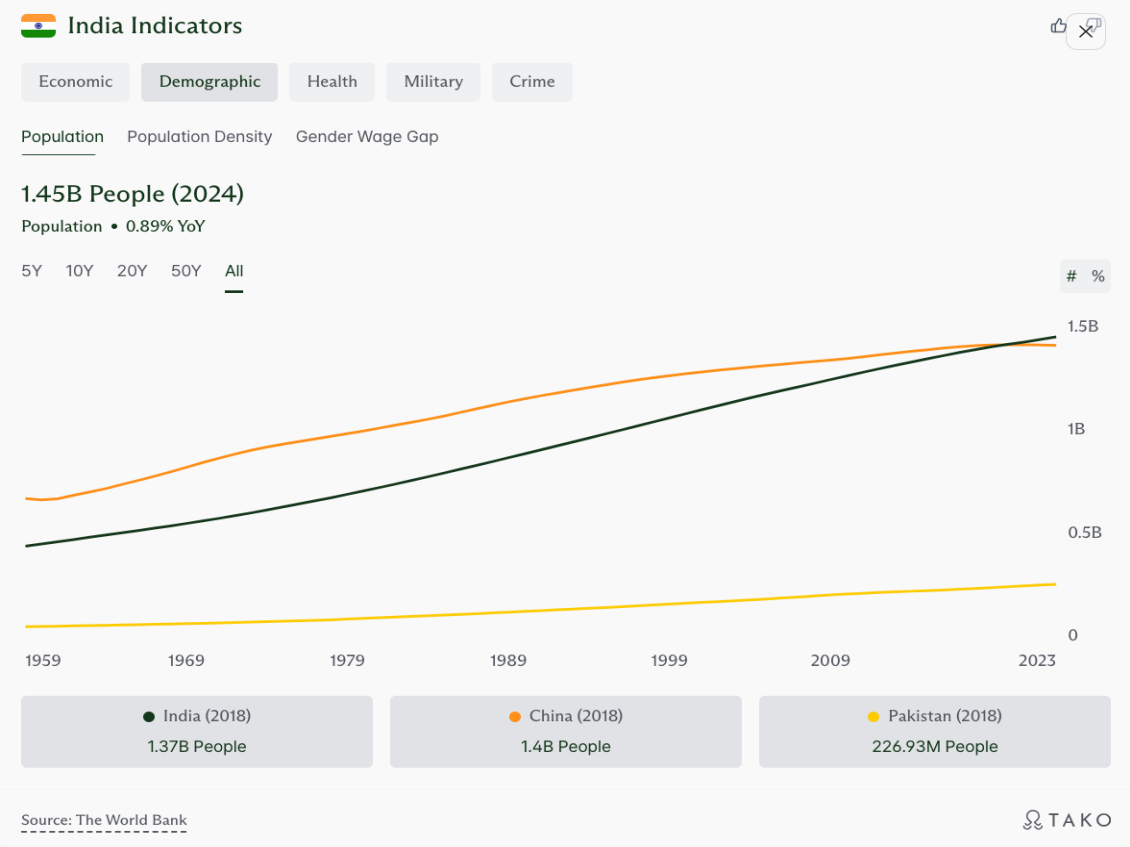
Illegal activities, particularly poaching and illicit trade, pose primary and persistent threats to

[74] Tigers face "unprecedented" threat from transport - WWF (2016).
[75] Forecasting effects of transport - PeerJ (2022).
[76] N. Carter et al. (2022).
[77] Rapid behavioral responses of tigers to roads (n.d.).
[78] EW Sanderson et al. (2019). Shared socioeconomic pathways.
[79] Hydroelectric dams take toll on big cats (2021).
[80] Hydroelectric dams linked to tiger losses - BBC (2021).
[81] George Nittu et al. (2022). Tide of tiger poaching in India.
[82] Patterns of illegal tiger parts - Wiley (2022).

tiger populations worldwide.[83] Despite tigers being listed on Appendix I of CITES (Convention on International Trade in Endangered Species), which prohibits commercial international trade for species threatened with extinction, illegal trade continues to thrive. The global illegal wildlife trade is valued at up to $20 billion USD annually, with tiger parts highly sought after for traditional Chinese medicine and luxury décor, such as bones for tiger bone wine and skins.[84] Between 2000 and 2018, 1142 tiger part seizures were reported globally, with nearly half occurring in India, a country home to over half of the world's wild tiger population.[85]The scale of illegal tiger trade entering countries like the United States has also been underestimated, with 292 seizures recorded between 2003 and 2012, predominantly involving medicinal products from countries like China and Vietnam.[86]

The decline of the tiger's natural prey base is intrinsically linked to these illegal activities and habitat degradation, forcing tigers to prey on domestic livestock and increasing human-tiger conflict.[87] Tigers require vast areas of suitable habitat with a sufficient prey base of large ungulates like wild pigs and deer to thrive. However, prey populations are dwindling due to unsustainable hunting, habitat degradation, infrastructure development, and mining activities, which fragment forests and reduce available prey.[88] This scarcity compels tigers to venture into human settlements in search of food, escalating conflict and retaliatory killings. Injured or sick tigers, whose hunting skills are impaired, are also more likely to attack humans or livestock as they become desperate for easier prey.[89] Addressing the decline in prey populations is crucial for long-term tiger conservation, necessitating efforts to increase large ungulate populations through measures such as reintroduction, supplementary feeding, and regular removal of hunting traps.[90]

[83] Background - Saving India's Tigers (n.d.).
[84] Explained: State of India's tiger prey - Indian Express (2025).
[85] Effect of human disturbance on prey - ScienceDirect (2013).
[86] Links in a sink: Ecological structure and prey loss (2022).
[87] Conservation saved India's tigers - CS Monitor (2025).
[88] P. Neupane (2024). Impacts of linear infrastructure on connectivity.
[89] Links in a sink: Ecological structure and prey loss (2022).
[90] Conservation saved India's tigers - CS Monitor (2025).



The conservation of tigers in urbanizing landscapes presents a formidable challenge, requiring a multi-faceted approach that addresses the interconnected threats of habitat fragmentation, human-tiger conflict, infrastructure development, and illegal activities impacting prey populations. Restoring habitat connectivity through well-planned corridors, implementing spatiotemporal management strategies to mitigate human-tiger interactions, and promoting sustainable infrastructure development that avoids critical tiger habitats are essential steps. Furthermore, combating illegal wildlife trade through enhanced enforcement and forensic analysis, alongside efforts to restore and maintain a robust natural prey base, are paramount for the long-term survival of wild tigers. Collaborative efforts involving local communities, governments, and conservationists, coupled with adaptive management strategies, are critical to ensuring a future where humans and tigers can coexist harmoniously.

ROLE OF NATIONAL GREEN TRIBUNAL

The National Green Tribunal (NGT): Role and Functioning in Environmental Justice

The National Green Tribunal (NGT) plays a crucial role in India's environmental justice system, providing a specialized forum for the effective and expeditious resolution of disputes

related to environmental protection, forest conservation, and the enforcement of environmental legal rights[91]. The NGT has a principal bench in New Delhi and regional benches in Bhopal, Pune, Kolkata, and Chennai[2].

Role of the National Green Tribunal

The NGT was established on October 18, 2010, under the National Green Tribunal Act, 2010[92]. It is a quasi-judicial body set up in response to growing environmental challenges, following recommendations in key judgments like *M.C. Mehta v. Union of India*[93]. India became the third country globally (after Australia and New Zealand) to establish such a body[1].

The NGT's primary objectives include speedy disposal of environmental cases (within six months), and enforcement of the "polluter pays", "precautionary", and "sustainable development" principles[94]. It is not bound by the Code of Civil Procedure, 1908, and follows the principles of natural justice[2].

Functioning of NGT in Wildlife and Environmental Disputes

The NGT has jurisdiction over civil cases under seven environmental laws listed in Schedule I of the Act[2], including:

- The Water Act, 1974
- The Forest (Conservation) Act, 1980
- The Air Act, 1981
- The Environment (Protection) Act, 1986
- The Public Liability Insurance Act, 1991
- The Biological Diversity Act, 2002

[91] Environmental Courts in Comparative Perspective, https://www.semanticscholar.org/paper/e6e47377b3c20f03f1845cbe117f125456d81bb1
[92] About us - National Green Tribunal, https://greentribunal.gov.in/about-us
[93] Environmental Justice in India: The National Green Tribunal, https://www.taylorfrancis.com/books/9781317415619
[94] Everything you need to know about the NGT, https://www.conservationindia.org/resources/ngt

Notably, the NGT **does not** have jurisdiction over the Wildlife (Protection) Act, 1972 or the Forest Rights Act, 2006[95]. However, it can intervene in cases where violations of other environmental laws affect wildlife.

For example, in 2024, the NGT took *suo motu* cognizance of elephant deaths in Bandhavgarh Tiger Reserve, citing possible violations of the Forest Conservation Act, 1980, and the Environment Protection Act, 1986[96].

The NGT's members include a Chairperson (former Supreme Court or High Court judge), judicial members, and expert members with at least 15 years of experience in environmental matters[2]. In 2021, the Supreme Court affirmed the Tribunal's *suo motu* powers[7].

Case Studies

- **Bandhavgarh Elephant Deaths (2024)**: NGT took *suo motu* action on media reports about ten elephant deaths in Madhya Pradesh[6].
- **Son Ghariyal Sanctuary (2018)**: NGT criticized illegal sand mining threatening wildlife[97].
- **Bhopal Groundwater (2024)**: NGT ordered fresh sampling due to contamination concerns[98].
- **Pachmarhi Airstrip (2025)**: NGT disposed of a petition, imposing strict environmental safeguards[99].
- **Bhopal Ramsar Wetland (2023)**: NGT initiated monitoring of cruise operations in the protected wetland[100].

[95] National Green Tribunal - Wikipedia, https://en.wikipedia.org/wiki/National_Green_Tribunal
[96] THE ROLE OF THE NATIONAL GREEN TRIBUNAL (NGT), https://www.vintagelegalvl.com/post/the-role-of-the-national-green-tribunal-ngt-is-it-effective
[97] THE ROLE OF THE NATIONAL GREEN TRIBUNAL (NGT), https://www.vintagelegalvl.com/post/the-role-of-the-national-green-tribunal-ngt-is-it-effective
[98] Wildlife under threat in Son park, https://timesofindia.indiatimes.com/city/bhopal/wildlife-under-serious-threat-in-son-park-national-green-tribunal/articleshow/65223971.cms
[99] Bhopal Groundwater Sampling, https://www.bhopal.org/news/national-green-tribunal-orders-bhopal-groundwater-sampling/
[100] THE ROLE OF THE NATIONAL GREEN TRIBUNAL (NGT), https://www.vintagelegalvl.com/post/the-role-of-the-national-green-tribunal-ngt-is-it-effective

Filing Process, Scrutiny, and Hearing Procedures

- **Application Submission**: Forms and templates are available online; the NGT accepts 24/7 e-filing[101].

- **Fees**: ₹1,000 for general applications; 1% of compensation amount (min ₹1,000) if compensation is sought[102].

- **Compensation**: Relief for victims of pollution, property damage, or environmental restoration must be filed within five years[103].

- **Letter Petitions**: The NGT also accepts informal complaints highlighting substantial environmental harm[15].

Hearing and Enforcement:

- The NGT is not bound by procedural laws but follows natural justice principles[2104].

- Parties are identified and contacted via email to avoid delays[105].

- Factual and "action taken" reports are sought from authorities before ruling[106].

- Committees (including retired judges) may be formed for enforcement[107].

- Remote hearings via video conferencing are common, though regional benches like Bhopal have faced technical delays[2].

[101] Pachmarhi Airstrip Conditions, https://timesofindia.indiatimes.com/city/bhopal/ngt-disposes-petition-on-pachmarhi-airstrip-imposes-strict-environmental-conditions/articleshow/119553587.cms
[102] Bandhavgarh Elephant Deaths, https://timesofindia.indiatimes.com/city/bhopal/national-green-tribunal-issues-notices-in-bandhavgarh-elephant-death-case-seeks-immediate-response/articleshow/115323668.cms
[103] Cruise probe at Bhopal Ramsar Wetland, https://www.downtoearth.org.in/pollution/ngt-probe-into-cruise-operating-in-bhopal-ramsar-wetland-87254
[104] User Manual – NGT e-Filing, https://greentribunal.gov.in/sites/default/files/all_documents/User%20Manual_efiling_NGT.pdf
[105] Procedure for Filing Application in NGT, https://www.scribd.com/document/624285044/Procedure-for-Filing-Application-in-NGT
[106] The Law Advice - Filing at NGT, https://www.thelawadvice.com/articles/a-guide-to-file-complaint-at-ngt
[107] Methodology of NGT, https://www.greentribunal.gov.in/methodology-ngt

- **Penalties**: Non-compliance with orders can lead to imprisonment up to 3 years, fines up to ₹10 crore, or both[2].

Review and Appeals: A party may seek review. If denied, appeals lie directly to the Supreme Court within 90 days[2].

Applicable Legal Framework for Tiger Conservation in India

Tiger conservation in India operates within a robust legal framework that integrates wildlife protection, forest governance, and biodiversity conservation, reinforced by constitutional mandates. At the core lies the *Wildlife (Protection) Act, 1972* (WLPA), a landmark statute that provides for the protection of endangered species through the creation of national parks, wildlife sanctuaries, and tiger reserves. The 2006 amendment to the WLPA, inserting **Chapter IVB**, established the *National Tiger Conservation Authority* (NTCA) with statutory authority to implement *Project Tiger* and ensure scientific management of reserves[108]. The Act also mandates the preparation of Tiger Conservation Plans under **Section 38V**, which require habitat preservation, corridor protection, and mitigation of human-tiger conflicts.

Complementing the WLPA is the *Biological Diversity Act, 2002*, which aims to safeguard ecological processes by regulating access to biodiversity and ensuring equitable benefit-sharing. Since tigers are apex predators, their conservation under this Act indirectly ensures the protection of prey species and forest ecosystems[109]. Additionally, the *Indian Forest Act, 1927* and the *Forest (Conservation) Act, 1980* regulate diversion of forest land, directly impacting tiger habitats such as the Ratapani Wildlife Sanctuary near Bhopal, which has been recommended for upgradation to a Tiger Reserve[110].

The constitutional framework reinforces these statutory protections. **Article 48A** of the Directive Principles of State Policy obligates the State to protect and improve the environment and safeguard wildlife, while **Article 51A(g)** imposes a fundamental duty on every citizen to protect the natural environment[111]. The judiciary has also played a pivotal role — in *Centre for Environmental Law, WWF-India v. Union of India* (2013) 8 SCC 234, the Supreme Court

[108] Wildlife (Protection) Amendment Act, 2006, No. 39 of 2006, § 38L–38X
[109] Biological Diversity Act, 2002, No. 18 of 2003
[110] Forest (Conservation) Act, 1980, No. 69 of 1980; Indian Forest Act, 1927, No. 16 of 1927.
[111] INDIA CONST. art. 48A; art. 51A(g)

directed States to notify buffer zones around tiger reserves, underscoring the principle of *ecocentrism* over *anthropocentrism*[112].

For Bhopal, the application of these laws must be contextualised within the region's unique urban-wildlife interface. The proximity of Ratapani and the Bhoj Wetland to expanding human settlements necessitates a hybrid conservation strategy — one that combines strict enforcement of the WLPA with community engagement, habitat connectivity initiatives, and use of modern tools such as camera traps and satellite-based monitoring. Strengthening legal compliance in forest corridors connecting Ratapani to other habitats, and leveraging provisions under **Section 38X** of the WLPA for community involvement, can significantly reduce conflict and support sustainable coexistence.

STRENGTHENING TIGER CONSERVATION IN BHOPAL: PROPOSED MEASURES

While Bhopal benefits from proximity to the **Ratapani Wildlife Sanctuary**—proposed as a tiger reserve—the unique urban-forest interface presents challenges requiring tailored interventions. The following measures, grounded in legal and policy frameworks, could significantly enhance conservation outcomes:

1. Legal Notification of Ratapani as a Tiger Reserve

Despite its ecological importance, Ratapani has yet to be formally declared a tiger reserve under Section 38V of the WLPA[113]. This notification would enable stricter protection protocols, increased funding from the NTCA, and a clear demarcation of core and buffer zones.

2. Strengthening Habitat Connectivity

Enforcement of **Eco-Sensitive Zone (ESZ) notifications** under the EPA[114] around Ratapani and Bhoj Wetland could prevent unregulated urban expansion and preserve tiger corridors linking Ratapani to Satpura landscapes.

[112] Centre for Environmental Law, WWF-India v. Union of India, (2013) 8 SCC 234.
[113] Wildlife (Protection) Act, 1972, No. 53 of 1972, India Code.
[114] Environment (Protection) Act, 1986, No. 29 of 1986, India Code.

3. Community-Based Conservation Models

Implementing *Ecodevelopment Committees* (WLPA, 1972, S. 36C)[115] can involve local communities in anti-poaching patrols, conflict mitigation, and eco-tourism initiatives, providing sustainable livelihoods while reducing dependence on forest resources.

4. Technological Monitoring

5. Deploying **M-STrIPES** (Monitoring System for Tigers – Intensive Protection and Ecological Status) with drone surveillance can strengthen real-time patrolling and habitat monitoring, complementing field staff efforts.

6. Conflict Mitigation Mechanisms

Given Bhopal's urban tiger sightings, rapid-response teams trained in humane conflict resolution and compensation disbursal (within NTCA's[116] 48-hour guideline) can reduce retaliatory killings.

7. Stricter Law Enforcement on Wildlife Trade

Coordination between the **Wildlife Crime Control Bureau (WCCB)** and state forest officials can disrupt illegal trade networks, in line with CITES[117] obligations and WLPA's[118] penal provisions.

[115] Forest (Conservation) Act, 1980, No. 69 of 1980, India Code.
[116] Centre for Environmental Law, WWF-India v. Union of India, (2013) 8 SCC 234.
[117] Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973.
[118] National Tiger Conservation Authority, Standard Operating Procedures for Tiger Conservation, 2021.

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22. MP Tiger Foundation Samiti – https://www.mptigerfoundation.org

23. Case Studies and News Articles

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25. Indian Express: https://indianexpress.com/article/explained/ratapani-mp-tiger-reserve-protected-areas-9708543/

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35. Environmental Justice in India: The National Green Tribunal (Taylor & Francis) https://www.taylorfrancis.com/books/9781317415619

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APPENDICES

Appendix A: Sample Applications Drafted

1. Application under Section 14 of the NGT Act, 2010
Subject: Illegal sand mining affecting wildlife habitat
Relief sought: Immediate halt to mining activity and compensation for ecological restoration.

2. Application under Section 15 for Compensation
Subject: Restoration of degraded wetland ecosystem in Bhopal
Relief sought: Environmental compensation from polluting cruise operator under the "Polluter Pays" principle.

3. Application for Compliance Monitoring
Subject: Non-implementation of tree plantation order
Relief sought: Appointment of an independent monitoring committee and imposition of penalties for non-compliance.

Appendix B: Relevant Notifications and Legal Documents

- Notification of Ratapani Wildlife Sanctuary as a Tiger Reserve (Government of Madhya Pradesh, 2023)
- Office Memorandum on Eco-sensitive Zone Delimitation around Bhoj Wetland (MoEF&CC, 2020)
- NGT Order in *Bandhavgarh Elephant Deaths Case* (2024)
- NGT Procedural Guidelines on Filing and Hearing (Latest update from NGT e-filing portal)
- Copy of Forest (Conservation) Rules, 2022 (Relevant for recent judgments)

Appendix C: Data Charts and Graphs

1. Wildlife Mortality in Ratapani Region (2020–2024)

Data Source: MP Forest Department
(Chart Type: Bar Graph)

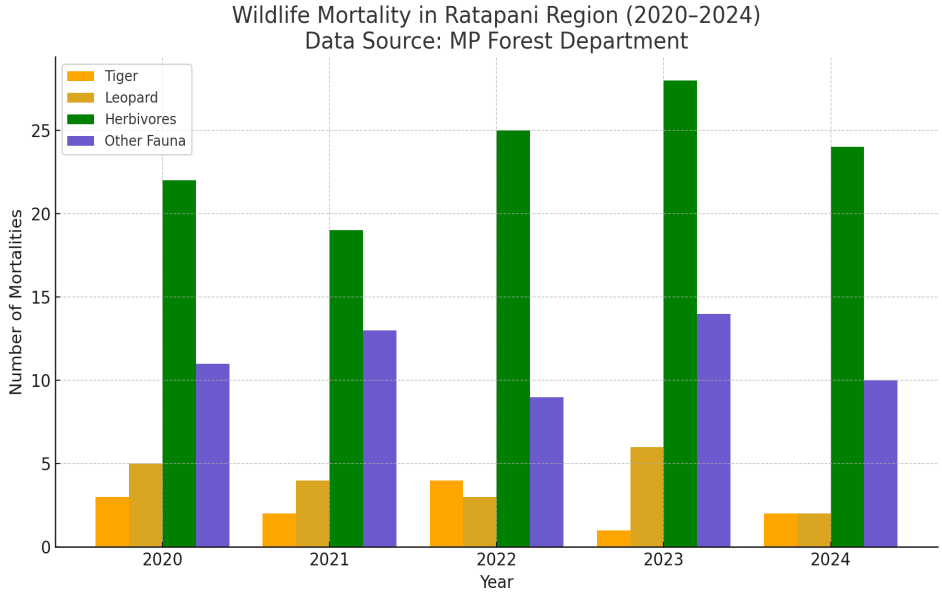
2. Number of Suo Motu Cases Taken up by NGT (2020–2024)
Data Source: NGT Central and Zonal Bench Records
(Chart Type: Line Chart)

3. Groundwater Contamination Levels in Bhopal (Comparative Study 2022 vs. 2024)
(Chart Type: Table with graphical representation)

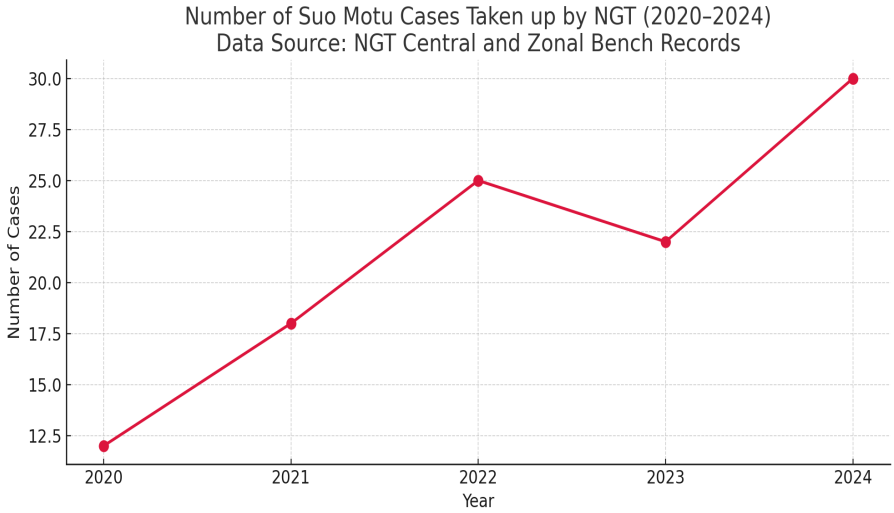
Appendix D: Photographs

- Image 1: Entrance to Central Zonal Bench, NGT Bhopal
- Image 2: Field photograph of degraded patch near Bhoj Wetland due to tourist activities
- Image 3: Infographic on the jurisdictional overlap of Indian environmental laws
- Image 4: News clipping on the Bandhavgarh Elephant Death case (*Times of India*, March 2024)

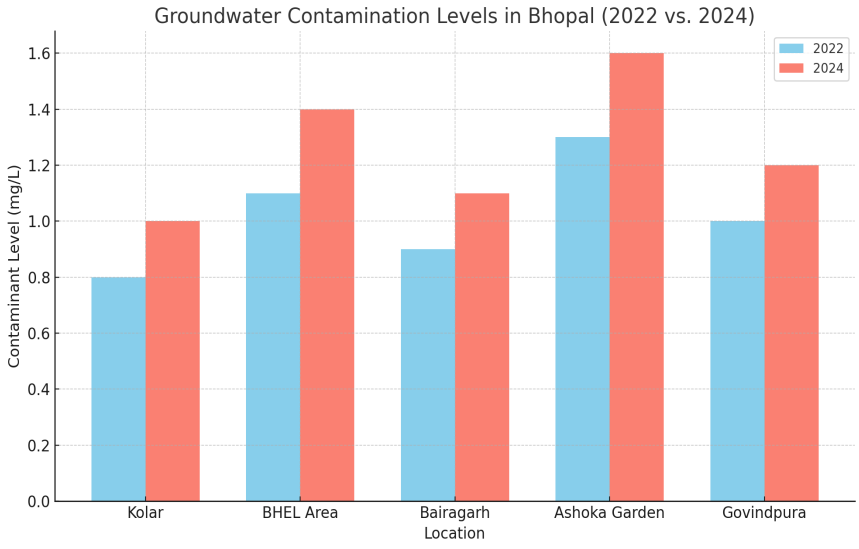
C 1 -


Wildlife Mortality in Ratapani Region (2020–2024)
Data Source: MP Forest Department
Tiger
Leopard
Herbivores
Other Fauna
Number of Mortalities
0
5
10
15
20
25
2020
2021
2022
2023
2024
Year

C 2 -


Number of Suo Motu Cases Taken up by NGT (2020–2024)
Data Source: NGT Central and Zonal Bench Records
Number of Cases
12.5
15.0
17.5
20.0
22.5
25.0
27.5
30.0
2020
2021
2022
2023
2024
Year

C 3 -


Groundwater Contamination Levels in Bhopal (2022 vs. 2024)
2022
2024
Contaminant Level (mg/L)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Kolar
BHEL Area
Bairagarh
Ashoka Garden
Govindpura
Location

D-1 Entrance to Central Zonal Bench, NGT Bhopal near Bhoj Wetland due to tourist activities

D - 2 Field photograph of degraded patch near Bhoj Wetland due to tourist activities

D-3 Infographic on the jurisdictional overlap of Indian environmental laws

D-4 News clipping on the Bandhavgarh Elephant Death case (*Times of India*, March 2024)