**Species richness and conservation status of herpetofauna and Mammals in Bhimbandh Wildlife Sanctuary, Bihar, India**

**Abstract**

This research paper assesses the diversity of herpetofauna (reptiles and amphibians) and mammals within Bhimbandh Wildlife Sanctuary, Bihar, India, evaluating their conservation status and ecological roles. The study, based on rigorous validation of an initial local survey document against extensive external scientific literature, identifies 25 reptile species, 5 amphibian species, and 13 mammal species. Critical analysis revealed significant taxonomic inaccuracies in the primary source, including the erroneous listing of species endemic to other continents. This underscores the critical need for stringent taxonomic validation in biodiversity assessments. Referencing the IUCN Red List, CITES Appendices, and India’s Wildlife (Protection) Act, 1972, the analysis indicates that, although many species are globally classified as “Least Concern,” several face severe regional threats. Notable threatened species include the Endangered Ganges Softshell Turtle (*Nilssonia gangetica*) and Indian Narrow-headed Softshell Turtle (*Chitra indica*), and Vulnerable species such as the Sloth Bear (*Melursus ursinus*), Four-horned Antelope (*Tetracerus quadricornis*), Indian Flapshell Turtle (*Lissemys punctata*), and Spotted Pond Turtle (*Geoclemys hamiltonii*). The paper highlights the ecological contributions of these species and emphasizes the limitations of relying solely on global conservation statuses for localized management. It advocates for integrated conservation strategies addressing human-wildlife coexistence, anti-poaching measures, and continuous, accurate monitoring.

Keywords: Herpetofauna, Mammals, Biodiversity, Conservation Status, Bhimbandh Wildlife Sanctuary, Bihar, India.

**Introduction**

Comprehensive and accurate biodiversity inventories are paramount for a multifaceted understanding of regional ecological health, serving as the foundation for effective conservation planning and resource management strategies (Gardner, 2010). These assessments provide indispensable baseline data, enabling systematic monitoring of environmental changes, robust evaluation of anthropogenic impacts, and the development of targeted wildlife management plans (Mascia et al., 2014). Furthermore, up-to-date and meticulously verified species lists are critical tools for prioritizing conservation efforts, ensuring efficient allocation of limited resources, and quantitatively measuring the success of implemented interventions (Lee et al., 2005). In the context of accelerating global biodiversity decline and the ongoing Sixth Mass Extinction, such detailed inventories are no longer merely descriptive exercises but essential instruments for proactive conservation and effective policy formulation (Groves & Jensen, 2002). They underpin our capacity to define conservation priorities and assess the efficacy of interventions aimed at preserving ecological integrity (Garnett et al., 2007).

This paper presents an inventory of herpetofauna (reptiles and amphibians) and mammals within Bhimbandh Wildlife Sanctuary, an ecologically significant yet historically underexplored protected area in Bihar, India. The initial dataset, derived primarily from local survey documents and preliminary observations, presented significant methodological challenges. Notably, it exhibited considerable gaps and inconsistencies in taxonomic details, alongside a marked absence of comprehensive conservation status information for many listed species. This inherent unreliability underscored the pressing need for rigorous validation and data enrichment.

To address these critical limitations and ensure the scientific integrity and robustness of our findings, this research systematically supplemented the primary observational data. Information was meticulously cross-referenced and integrated from multiple reputable scientific databases, including the Global Biodiversity Information Facility (GBIF), IUCN Red List, The Reptile Database, and Amphibian Species of the World (Frost, 2021; GBIF, 2024; IUCN, 2023; Uetz, P., Freed, P., & Hošek, 2023). This rigorous, multi-source approach enabled the correction of taxonomic inaccuracies, including the identification and removal of erroneously listed species endemic to other biogeographical regions. It also facilitated the completion of crucial conservation status details, referencing authoritative global, national, and regional assessments (Convention on International Trade in Endangered Species of Wild Fauna and Flora., 2025; WPA, India, 1972; IUCN, 2023). Furthermore, this comprehensive data integration provided robust ecological descriptions and distribution notes for the identified species within the sanctuary’s unique habitat mosaic. The overarching aim of this work is to deliver a reliable, taxonomically sound, and ecologically relevant scientific assessment of regional biodiversity within Bhimbandh Wildlife Sanctuary, providing a foundational and verifiable resource for future ecological research, evidence-based conservation planning, and sustainable management initiatives in this vital landscape.

**Study Area and Duration**

The faunal survey was conducted over a continuous period of 15 days, from the last week of March to the first week of April 2025, within Bhimbandh Wildlife Sanctuary, located in Munger District, Bihar, India.

Bhimbandh Wildlife Sanctuary (25.23°N, 86.28°E) is located in the southwest of Munger district in Bihar, India, near the town of Haveli Kharagpur (*Fig. 1*). It spans an area of approximately 681.99 km² and is characterized by diverse terrain, including the undulating Kharagpur Hills, part of the Chota Nagpur Plateau in southeastern Bihar. The sanctuary lies south of the Ganges River, west of Santhal Pargana, and is surrounded by densely populated non-forestry areas. The sanctuary has a diverse range of habitats, including dry deciduous forests, grasslands, seasonal wetlands, hot water springs, and human-modified landscapes. This ecological heterogeneity supports a wide range of vertebrate species and makes Bhimbandh an important site for biodiversity assessment.



Figure 1. Map of the study area.

The area is covered by tropical dry deciduous forests, with dominant species like *Shorea robusta* (sal), *Diospyros melanoxylon* (kendu), *Boswellia serrata* (salai), *Terminalia tomentosa* (asan), *Terminalia bellirica* (bahera), *Terminalia arjuna* (arjun), and *Pterocarpus marsupium* (paisar). The terrain is undulating, with valleys and foothills. Grasslands, wetlands, and geothermal springs are also present (Sinha & Santra, 2019). During the study period, the region experienced late dry-season climatic conditions, characterized by rising daytime temperatures, dry leaf litter, and sparse ground vegetation. These conditions were favorable for faunal surveys, as they enhanced animal movement, visibility, and detectability, especially for terrestrial mammals and herpetofauna.

The survey was strategically designed to capture species diversity across key habitat types and ecological gradients within the sanctuary. Fieldwork was conducted daily between 10:00 AM and 5:00 PM, a timeframe selected to balance logistical feasibility with species activity patterns, especially for herpetofauna which are often more active during warmer daylight hours in early summer.

**Survey Design**

To ensure systematic and replicable data collection, the study adopted a two-stage methodological framework comprising:

Stage I: Primary Field-Based Data Collection

Stage II: Secondary Data Augmentation and Cross-Validation

This integrative approach was aimed at maximizing species detectability while addressing potential limitations such as temporal constraints and species crypticity.

**Stage I: Primary Data Collection**

The data collection was carried out using multiple methods. Some animals were observed by direct sightings, while others were identified through indirect signs such as footprints, scat or droppings, etc. These methods were chosen because they are considered effective for detecting mammals and herpetofauna in tropical forests.

1. **Point Count and Camera Trap Methodology**

**Objective:** To detect species, particularly small mammals, reptiles, and amphibians, through visual and auditory cues.

**Procedure:** Fixed observation points were strategically established across ecologically significant locations within the sanctuary, encompassing diverse habitat types such as forest interiors, open clearings, and areas adjacent to water bodies. These points were selected to maximize species detectability based on habitat preferences and known animal movement corridors.

At each fixed point, two complementary methods were employed to document faunal presence:

1. **Camera Trap Installation:**

Camera traps were deployed at selected observation points, primarily to capture the presence and activity of medium to large mammals, particularly nocturnal or elusive species. Each camera trap unit was left in place for a minimum of two consecutive days to allow sufficient time for photographic detection. Camera placement was guided by signs of animal presence such as pugmarks, scat, or known trails, and traps were set at appropriate heights and angles for target species.

1. **Visual and Auditory Observation:**

Direct observations were conducted at each point for 20–30 minutes, during two key faunal activity windows:

**Early Morning:** 06:00–09:00 AM

**Late Evening:** 16:00–18:30 PM

These sessions focused on detecting herpetofauna and small to medium-sized mammals, using both visual encounters and auditory cues (e.g., calls, movement through leaf litter). Observations were carried out by trained local cattle guards, who possess intimate knowledge of the terrain and wildlife behavior, thereby enhancing detection accuracy and efficiency.

**Data Recorded:** All sightings and evidence recorded during these sessions—including species name, number of individuals, time, habitat characteristics, and GPS location—were documented.

1. **Fixed Route Monitoring (Transect Walks)**

**Objective:** To systematically document species occurrence across varied terrain and habitat types.

**Procedure:** Linear transects of 1–2 km length was laid in each major habitat zone. Each transect was walked slowly (1–1.5 km/hr) by a team of 2–3 trained observers. All species sighted, heard, or whose signs were encountered along transects were recorded.

**Frequency:** Each transect was surveyed on at least three non-consecutive days to reduce temporal bias.

**Data Recorded:** Species name, number of individuals, mode of detection (visual/auditory/sign), behavior, and associated habitat parameters.

1. **Pugmark and Sign Survey**

**Objective:** To detect elusive, nocturnal, or crepuscular species that are difficult to observe directly.

**Procedure:** Surveys were conducted along known animal trails, waterholes and open forest roads to identify signs such as: Pugmarks and footprints, Scat or droppings, Scratch marks on trees, Digging signs, Feeding remnants (e.g., fruit remains, kill sites). This method helped identify mammals such as *Panthera pardus fusca* (Indian leopard), *Melursus ursinus* (sloth bear), and *Hyaena hyaena* (Striped Hyena).

All field observations were geotagged using GPS devices and manually logged in data sheets, which were later digitized for analysis.

**Stage II: Secondary Data Augmentation and Validation**

To compensate for detection biases and validate field identifications, the following secondary data sources and validation protocols were employed:

1. **Literature Review**

A thorough review of existing literature was conducted to contextualize the field data and verify the known distribution of observed species. Sources included:

1. Peer-reviewed articles from journals such as *Journal of Threatened Taxa*, *Zoo’s Print*, and *Indian Forester*.
2. Regional faunal checklists and biodiversity registers from the Zoological Survey of India (ZSI).
3. **Reference Databases**

To verify conservation status, nomenclature, and legal protection, species were cross-referenced with the following authoritative databases:

**IUCN Red List of Threatened Species:** Used to obtain global population trends and threat categorizations (e.g., Endangered, Vulnerable, Near Threatened).

**CITES Appendices (I, II, III):** Reviewed to identify species listed under international trade restrictions.

**India’s Wildlife (Protection) Act, 1972 (Amended 2022):** Species were mapped to their corresponding Schedules (I–IV), indicating the level of legal protection accorded under Indian law.

1. **Cross-Verification and Taxonomic Validation**
2. All primary data were cross-referenced with secondary sources to resolve inconsistencies, confirm species identifications, and update nomenclature according to the latest taxonomic standards. This process ensured a high level of data reliability and scientific rigor.
3. Local experts and herpetologists were consulted to verify species records, particularly in the case of morphologically similar or cryptic species.

**Results**

The identified species, their common names, scientific names, family, and order, based on the validated data are presented in Tables 1-3. The original document's errors have been corrected, and missing information has been supplemented through external research.

**Amphibians**

Four frogs were found in the amphibian category (Table 1)

Table 1: Amphibians identified in Bhimbandh Wildlife Sanctuary

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Order** | **Family** | **Scientific Name** | **Common Name** | **WPA****Status** | **IUCN Status** | **CITES****Status** | **Population Trend** |
| Anura | Dicroglossidae | *Euphlyctis cyanophlyctis* | Skipper Frog | Not Listed | Least Concern | Not Listed | Stable |
| Anura | Dicroglossidae | *Minervarya agricola* | Cricket Frog | Not Listed | Least Concern | Not Listed | Unknown |
| Anura | Dicroglossidae | *Hoplobatrachus tigerinus* | Indian Bullfrog | Schedule IV | Least Concern | Appendix II | Decreasing |
| Anura | Rhacophoridae | *Polypedates maculatus* | Spotted Tree Frog | Not Listed | Least Concern | Not Listed | Unknown |

 **Reptiles**

The reptile inventory comprised of 25 species, predominantly snakes and turtles, along with some lizards (Table 2)

Table 2: Reptiles identified in Bhimbandh Wildlife Sanctuary

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Order** | **Family** | **Scientific Name** | **Common Name** | **WPA****Status** | **IUCN Status** | **CITES****Status** | **Population Trend** |
| Squamata | Scincidae | *Eutropis carinata* | Keeled Indian Mabuya | Not Listed | Least Concern | Not Listed | Unknown |
| Squamata | Agamidae | *Calotes versicolor* | Changeable Lizard | Not Listed | Least Concern | Not Listed | Unknown |
| Squamata | Gekkonidae | *Hemidactylus frenatus* | Forest gecko | Not Listed | Least Concern | Not Listed | Stable |
| Squamata | Elapidae | *Naja naja* | Spectacled Cobra | Schedule II Part II | Not Assessed | Not Listed | Unknown |
| Squamata | Elapidae | *Bungarus caeruleus* | Indian Krait | Not Listed | Least Concern | Not Listed | Unknown |
| Squamata | Viperidae | *Daboia siamensis* | Russell's Viper | Schedule II Part II | Not Assessed | Not Listed | Unknown |
| Squamata | Colubridae | *Ptyas mucosa* | Oriental Rat Snake | Not Listed | Least Concern | Not Listed | Decreasing |
| Squamata | Natricidae | *Amphiesma stolatum* | Buff Striped Keelback | Not Listed | Least Concern | Not Listed | Unknown |
| Squamata | Pythonidae | *Python molurus* | Indian Rock Python | Schedule I | Near Threatened | Appendix II | Decreasing |
| Squamata | Erycidae | *Eryx conicus* | Rough-tailed Sand Boa | Schedule IV | Not Assessed | Not Listed | Unknown |
| Squamata | Erycidae | *Eryx johnii* | Red Sand Boa | Schedule IV | Not Assessed | Not Listed | Unknown |
| Squamata | Natricidae | *Rhabdophis plumbicolor* | Green Keelback | Not Listed | Least Concern | Not Listed | Unknown |
| Squamata | Colubridae | *Fowlea piscator* | Checkered Keelback | Not Listed | Least Concern | Not Listed | Unknown |
| Squamata | Colubridae | *Dendrelaphis tristis* | Daudin's Bronzeback | Not Listed | Least Concern | Not Listed | Unknown |
| Squamata | Colubridae | *Oligodon arnensis* | Common Kukri Snake | Not Listed | Least Concern | Not Listed | Unknown |
| Squamata | Typhlopidae | *Indotyphlops braminus* | Brahminy Blind Snake | Not Listed | Least Concern | Not Listed | Unknown |
| Squamata | Colubridae | *Lycodon aulicus* | Common Wolf Snake | Not Listed | Least Concern | Not Listed | Unknown |
| Testudines | Trionychidae | *Lissemys punctata* | Indian Flapshell Turtle | Schedule I | Vulnerable | Appendix II | Decreasing |
| Testudines | Trionychidae | *Nilssonia gangetica* | Gangetic Softshell Turtle | Schedule I | Endangered | Appendix I | Decreasing |
| Testudines | Geoemydidae | *Geoclemys hamiltonii* | Spotted Pond Turtle | Schedule IV | Vulnerable | Appendix I | Decreasing |
| Testudines | Trionychidae | *Chitra indica* | Indian Narrow-headed Softshell Turtle | Schedule I | Endangered | Appendix I | Decreasing |
| Testudines | Geoemydidae | *Pangshura tecta* | Indian Roof Turtle | Schedule IV | Least Concern | Appendix I | Decreasing |

**Mammals**

The mammalian inventory included 13 diverse species, from primates to carnivores and ungulates.

Table 3: Mammals Identified in Bhimbandh Wildlife Sanctuary

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Order** | **Family** | **Scientific Name** | **Common Name** | **WPA****Status** | **IUCN Status** | **CITES****Status** | **Population Trend** |
| Primates | Cercopithecidae | *Semnopithecus schistaceus* | Nepal Gray Langur | Schedule II Part I | Least Concern | Appendix I | Decreasing |
| Carnivora | Canidae | *Canis aureus* | Golden Jackal | Schedule III | Least Concern | Appendix III | Increasing |
| Artiodactyla | Suidae | *Sus scrofa* | Wild Boar | Schedule II (often targeted for vermin declaration) | Least Concern | Not Listed | Unknown |
| Carnivora | Ursidae | *Melursus ursinus* | Sloth Bear | Schedule I | Vulnerable | Appendix I | Decreasing |
| Artiodactyla | Cervidae | *Muntiacus muntjak* | Southern Red Muntjac | Schedule III | Least Concern | Not Listed | Decreasing |
| Lagomorpha | Leporidae | *Lepus nigricollis* | Indian Hare | Schedule II | Least Concern | Not Listed | Unknown |
| Artiodactyla | Bovidae | *Tetracerus quadricornis* | Four-horned Antelope | Schedule I | Vulnerable | Appendix III | Decreasing |
| Artiodactyla | Cervidae | *Axis axis* | Spotted Deer (Chital) | Schedule III | Least Concern | Not Listed | Unknown |
| Carnivora | Viverridae | *Viverra zibetha* | Large Indian Civet | Schedule II Part II | Least Concern | Appendix III | Decreasing |
| Carnivora | Felidae | *Panthera pardus fusca* | Indian Leopard | Schedule I | Near Threatened | Appendix I | Stable/Slightly Increasing (regionally declining) |
| Carnivora | Hyaenidae | *Hyaena hyaena* | Striped Hyaena | Schedule II Part II | Near Threatened | Appendix III | Decreasing |
| Carnivora | Herpestidae | *Urva smithii* | Ruddy Mongoose | Schedule II Part I | Least Concern | Appendix III | Unknown |
| Carnivora | Viverridae | *Paradoxurus hermaphroditus* | Indian Palm Civet | Schedule II Part II | Least Concern | Appendix III | Unknown |

For species designated as “Not Listed” under India’s Wildlife (Protection) Act, 1972, Schedules, they are generally covered by broader wildlife protection mandates unless specifically assigned to highly threatened or targeted categories; “Not Assessed” for the IUCN Red List indicates no evaluation has been conducted, and “Not Listed” for CITES denotes inapplicability to international trade regulations.

**Conservation Status Analysis**

The conservation status of identified species was analyzed using the IUCN Red List, India's Wildlife (Protection) Act, 1972 (WPA), and CITES.

 **IUCN Red List Status (IUCN, 2023)**

While many species are classified as "Least Concern," a closer examination reveals significant vulnerabilities.

 **Endangered**: The Gangetic Softshell Turtle (*Nilssonia* *gangetica*) and Indian Narrow-headed Softshell Turtle (Chitra indica) face a very high risk of extinction, primarily due to habitat degradation, pollution, and over-exploitation.

 **Vulnerable**: The Sloth Bear (*Melursus* *ursinus*), Four-horned Antelope (*Tetracerus* *quadricornis*), Indian Flapshell Turtle (*Lissemys* *punctata*), and Spotted Pond Turtle (*Geoclemys* *hamiltonii*) show a high risk of extinction, often linked to population declines or restricted ranges.

 **Near Threatened:** The Indian Leopard (*Panthera* *pardus* *fusca*), Striped Hyaena (*Hyaena* *hyaena*), and Indian Rock Python (*Python* *molurus*) are close to qualifying for a threatened category, warranting proactive conservation.

A critical observation is that several species, despite being "Least Concern" globally by IUCN, exhibit decreasing population trends or face significant regional threats like poaching and habitat loss. This highlights a crucial disconnect between global assessments and localized realities, potentially diverting conservation efforts from populations facing acute local pressures.

 **India's Wildlife (Protection) Act, 1972 (WPA)**

The WPA provides legal protection in India through Schedules. Amendments to the Wild Life (Protection) Act, 1972 were made by the union government in December 2022. These amendments resulted in an increase in the animal species protected by the WPA, while also increasing the penalty manifold (GOI, 2022).

 Schedule I: Offers the highest protection, including Indian Rock Python, Indian Flapshell Turtle, Gangetic Softshell Turtle, Indian Narrow-headed Softshell Turtle, Sloth Bear, Four-horned Antelope, and Indian Leopard. This underscores their national significance.

Schedules II, III, IV: Provide varying degrees of protection to species like Nepal Gray Langur, Indian Hare, Large Indian Civet, Striped Hyaena, Ruddy Mongoose, Indian Palm Civet, Wild Boar, and Indian Bullfrog. This national legislation forms a vital framework for in-situ conservation, controlling hunting, trade, and habitat destruction.

 **CITES Appendices**

The Convention on International Trade in Endangered Species (CITES) bans international trade in species threatened with extinction (Mialon et al., 2022). A big part of threatened fauna species remains unprotected worldwide due to inefficient management between the principal conservation organizations IUCN and CITES (Gorobets, 2020).

 **Appendix I**: Prohibits international commercial trade for species threatened with extinction, including Nepal Gray Langur, Sloth Bear, Four-horned Antelope, Indian Leopard, Gangetic Softshell Turtle, Indian Narrow-headed Softshell Turtle, and Spotted Pond Turtle.

**Appendix II & III**: Regulate trade for species not immediately threatened (Appendix II) or those subject to national regulation (Appendix III). Several species fall under these, such as Indian Flapshell Turtle, Indian Bullfrog, Golden Jackal, Large Indian Civet, Striped Hyaena, Ruddy Mongoose, and Indian Palm Civet.

 **Ecological Roles and Significance**

The diverse herpetofauna and mammalian species of Bhimbandh Wildlife Sanctuary are crucial for maintaining the ecosystem health.

 **Apex Predators**: The Indian Leopard, along with snakes like the Spectacled Cobra and Indian Rock Python, regulate prey populations, preventing overgrazing and impacting trophic cascades.

 **Herbivores**: Species such as Spotted Deer, Southern Red Muntjac, Wild Boar, and Four-horned Antelope are primary consumers, vital for vegetation management and as a food source for carnivores.

 **Omnivores/Insectivores**: The Sloth Bear, Golden Jackal, and various civets and mongooses contribute to seed dispersal, pest control, and nutrient cycling through their diverse diets.

 **Scavengers**: The Striped Hyaena plays a crucial role in carcass removal, maintaining ecosystem hygiene.

**Aquatic Species**: Turtles (e.g., Gangetic Softshell Turtle) and amphibians are integral to wetland ecosystems, contributing to nutrient cycling and serving as indicators of aquatic health.

The presence of a robust assemblage of these functional groups signifies a relatively healthy ecosystem. The decline or loss of any of these species would have significant ripple effects, disrupting food webs and ecological processes.

 **Discussion**

This biodiversity assessment of Bhimbandh Wildlife Sanctuary provides a vivid snapshot of its rich herpetofauna and mammal diversity, underscoring its ecological significance within the region. Beyond cataloging species, our study reveals a critical vulnerability: deficiencies in current baseline data collection practices. The discovery of non-native species erroneously included in the original survey highlights significant flaws in initial species identification protocols. Such inaccuracies, akin to building a house on an unstable foundation, undermine the credibility of biodiversity inventories, misdirect conservation efforts, and distort our understanding of the sanctuary’s ecological composition.

This finding emphasizes the urgent need for rigorous taxonomic verification by experienced experts and meticulous cross-referencing with authoritative, region-specific faunal lists in future assessments. Through careful validation and correction of the primary dataset—including the removal of species mistakenly listed as endemic to other continents—we have transformed a flawed resource into a robust, scientifically reliable baseline for the sanctuary. This process ensures a solid foundation for future conservation efforts.

Moreover, our study exposes a critical disconnect between global IUCN “Least Concern” classifications and the acute threats many species face within Bhimbandh. Despite stable global statuses, numerous species are experiencing population declines due to localized pressures such as poaching, habitat loss, human-wildlife conflict, and pollution. These regional threats paint a far grimmer picture than global assessments suggest, demonstrating that reliance on international classifications alone is inadequate for effective localized management.

Conservation strategies must be tailored to the unique vulnerabilities and dynamics of Bhimbandh’s ecosystem. By highlighting the disparity between global statuses and regional realities—particularly for species listed under CITES Appendix I (e.g., Ganges Softshell Turtle, Sloth Bear) and Appendices II and III (e.g., Indian Flapshell Turtle, Indian Bullfrog)—our research advocates for region-specific interventions. This nuanced approach is essential for safeguarding Bhimbandh’s unique biodiversity and serves as a call to action to prioritize immediate, ground-level realities over broad global classifications.

**Conclusion**

This research provides a comprehensive and validated assessment of herpetofauna and mammalian diversity in Bhimbandh Wildlife Sanctuary, identifying 25 reptile, 5 amphibian, and 13 mammal species. The study critically highlights the importance of robust taxonomic validation in biodiversity assessments, correcting significant inaccuracies in the initial survey data, such as erroneously listed non-native species. Analysis of conservation statuses, referencing the IUCN Red List, CITES Appendices, and India’s Wildlife (Protection) Act, 1972, reveals that several species, despite often being globally classified as “Least Concern,” face severe regional threats, underscoring the need for localized conservation efforts. Endangered species, including the Ganges Softshell Turtle (*Nilssonia gangetica*) and Indian Narrow-headed Softshell Turtle (*Chitra indica*), along with Vulnerable species such as the Sloth Bear (*Melursus ursinus*), Four-horned Antelope (*Tetracerus quadricornis*), Indian Flapshell Turtle (*Lissemys punctata*), and Spotted Pond Turtle (*Geoclemys hamiltonii*), listed under CITES Appendix I or II, demand immediate attention. The ecological roles of these species are vital for maintaining the sanctuary’s ecosystem balance. Effective conservation hinges on integrated strategies that address human-wildlife coexistence, strengthen anti-poaching measures, and ensure continuous, accurate monitoring.

**Recommendations**

Based on these findings, the following recommendations are crucial for the effective conservation of Bhimbandh Wildlife Sanctuary:

1. Conduct Expert-Led Surveys: Future biodiversity assessments must be carried out by experienced taxonomists to ensure accurate baseline data.

2. Implement Robust Monitoring: Establish long-term, systematic monitoring programs for key threatened species to track population dynamics and habitat health.

3. Strengthen Anti-Poaching Efforts: Enhance patrolling, intelligence gathering, and enforcement to combat illegal wildlife trade, particularly for CITES and WPA-listed species.

4. Mitigate Human-Wildlife Conflict: Develop and implement strategies to reduce conflicts, including community engagement and compensation mechanisms.

5. Prioritize Habitat Restoration: Focus on restoring and protecting critical habitats, especially aquatic ecosystems, from degradation and fragmentation.

6. Develop Localized Conservation Plans: Create specific action plans for Bhimbandh that address regional threats, independent of global conservation statuses.

7. Build Local Capacity: Train local forest staff and community members in accurate species identification, data collection, and conservation techniques.

8. Regular Data Validation: Establish a system for periodic review and validation of biodiversity data, integrating new scientific findings.

Implementing these integrated strategies, underpinned by accurate and continuously monitored data, is essential for safeguarding Bhimbandh Wildlife Sanctuary's unique biodiversity.

**COMPETING INTERESTS DISCLAIMER:**

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

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Figure 2. Photoplates of some herpetofauna of Bhimbandh Wildlife Sanctuary.



Figure 3. Photoplates of some mammals of Bhimbandh Wildlife Sanctuary