

## Effectiveness of wildlife conservation laws in Uttar Pradesh: An empirical assessment

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### Abstract

Uttar Pradesh (UP), India's most populous state, harbors significant biodiversity within its Gangetic plains, Terai arcs, and the Vindhyan ranges. This paper presents an empirical assessment of the effectiveness of wildlife conservation laws in Uttar Pradesh, examining the implementation and outcomes of India's robust legal framework, including the Wildlife (Protection) Act, 1972 (WPA), at the state level. Through analysis of secondary data on species populations, habitat status, crime enforcement, and institutional capacities, alongside a review of judicial interventions and community involvement, the study identifies critical gaps between legislative intent and ground realities. Findings indicate notable successes in flagship species recovery within protected areas (PAs) but reveal systemic challenges in legal enforcement, habitat fragmentation outside PAs, human-wildlife conflict resolution, and funding constraints. The paper concludes with recommendations for a more integrated, technology-driven, and community-centric approach to enhance legal efficacy and ensure the long-term conservation of UP's wildlife.

**Keywords:** Wildlife protection act, wildlife conservation law, uttar pradesh, environmental governance, enforcement

### Introduction

Uttar Pradesh, despite its intense human demographic pressure, hosts vital ecosystems such as the Dudhwa National Park complex (Terai), Hastinapur Wildlife Sanctuary, and the fragile turtle habitats of the Chambal River. The state is home to endangered species including the Bengal tiger (*Panthera tigris tigris*), Asian elephant (*Elephas maximus*), swamp deer (*Rucervus duvaucelii*), and the critically endangered gharial (*Gavialis gangeticus*). India's conservation legal framework, spearheaded by the WPA [1], provides for species protection, habitat preservation, and regulation of trade. However, the effectiveness of these laws is contingent upon state-level enforcement, administrative will, socio-economic contexts, and ecological pressures. This research empirically assesses this effectiveness in Uttar Pradesh, measuring outcomes against legislative objectives to diagnose strengths and systemic failures.

### The Legal And Institutional Framework

- 1. Central Statutes:** The Wildlife (Protection) Act, 1972 (amended 2006 [2], 2022) forms the bedrock, creating schedules of protected species, regulating hunting, trade, and establishing Protected Area (PA) networks (National Parks, Wildlife Sanctuaries, Conservation Reserves). The Forest (Conservation) Act, 1980 [28], and the Environmental (Protection) Act, 1986 further shield habitats. The Biological Diversity Act, 2002 [27] mandates local governance through Biodiversity Management Committees.
- 2. State Machinery:** The Uttar Pradesh Forest Department (UPFD) is the primary implementing agency [3]. Key structures include the Chief Wildlife Warden, Wildlife Crime Control Units, and frontline staff (forest guards, watchers). The state has also constituted the Uttar Pradesh State Wildlife Board for advisory functions [16].

### Methodology

This empirical assessment employs a mixed-methods approach based on secondary data analysis (2010-2023)

- 1. Quantitative Analysis:** Trends in key indicator species populations (Tiger, Elephant, Leopard census data); Extent of Protected Areas and their management effectiveness (Management Effectiveness Evaluation - MEE reports); Wildlife crime data (National Crime Records Bureau, WCCB seizure reports); Human-wildlife conflict incidents (UPFD records).
- 2. Qualitative Analysis:** Review of critical judicial pronouncements (National Green Tribunal, Supreme Court, and Allahabad High Court cases); Analysis of government reports (Comptroller and Auditor General - CAG); Content analysis of media reports and NGO studies on enforcement challenges.
- 3. Limitations:** Reliance on publicly available data; potential under-reporting in crime and conflict data; limited access to internal departmental documents.

### Empirical Assessment: Indicators Of Effectiveness

- 1. Species Recovery and Population Trends (The Success Story)**
  - 1. Tigers:** Dudhwa Tiger Reserve has seen a steady increase, from 58 (2010) to over 100 (2022), showcasing effective protection in core areas [4, 29].
  - 2. Elephants:** The Terai elephant population remains stable (~400-450), but faces corridor fragmentation [5, 9].
  - 3. Swamp Deer:** Successful conservation in Dudhwa and Kishanpur sanctuaries, with populations exceeding 2,000, is a testament to habitat management under the WPA [6].

**4. Gharials:** Active river patrols and nest protection programs in the National Chambal Sanctuary have stabilized a once-declining population [7].

**5. Assessment:** Laws are effective within well-demarcated, high-priority PAs where institutional focus and resources are concentrated.

**Table 1:** Population Trends of Key Indicator Species in Uttar Pradesh (2010-2023)

Species	Key Habitat / Location	Population Estimate (2010 / Phase IV)	Population Estimate (2022 / Phase IV)	% Change	Primary Legal / Conservation Intervention
Bengal Tiger	Dudhwa Tiger Reserve	58 (2010)	107 (2022)	+84.5%	WPA-Schedule I; Project Tiger; Strict PA Protection [4]
Asian Elephant	Terai Arc (UP Zone)	425 (2012)	~452 (2023)	+6.4%	WPA-Schedule I; Project Elephant; Corridor Identification [5]
Swamp Deer	Dudhwa & Kishanpur WLS	~1,500 (2010)	~2,300 (2021)	+53.3%	WPA-Schedule I; Wetland Habitat Securement [6]
Leopard	State-wide	194 (2014)	648 (2022)	+234.0%	WPA-Schedule I; Adapted to Human-Dominated Landscapes
Gharial	National Chambal Sanctuary	~1,200 (2010)	~1,800 (2023)	+50.0%	WPA-Schedule I; In-Situ Nest Protection; Anti-Poaching Patrols [7]

**2. Habitat Protection and Management (The Mixed Picture)**

**1. PA Network:** UP has over 25 PAs covering ~1.14% of its geographical area, below the national average [8]. The legal process of notifying PAs, especially Conservation Reserves (e.g., Jhilmil Jheel), has been slow.

**2. Habitat Fragmentation:** Linear infrastructure (roads, railways) and land-use changes legally sanctioned via dilutions of the Forest Conservation Act have severely impacted critical corridors (e.g., Suhelwa-Katarniaghat link) [9, 25].

**3. Assessment:** Laws are partially effective. While the WPA secures habitat within PAs, overarching laws like the FCA have been weakened in implementation, failing to prevent landscape-level fragmentation.

**3. Wildlife Crime Control (A Significant Challenge)**

**1. Poaching and Trade:** UP remains a transit route for illegal wildlife products. Seizures of pangolin scales, tortoises, and big cat parts are frequent. Between 2015-2020, UP reported over 500 wildlife crime cases [10, 11].

**2. Enforcement Gaps:** Low conviction rates (<15%) due to poor investigation, witness intimidation, and protracted trials dilute the deterrent effect of stringent penalties under the WPA [11, 12]. Frontline staff often lack specialized training in forensic evidence collection.

**3. Assessment:** Laws are moderately to weakly effective. Strong statutory provisions exist (e.g., mandatory minimum sentences under amended WPA [2]), but implementation by enforcement and judicial systems is inefficient.

**4. Mitigation of Human-Wildlife Conflict (HWC)**

**1. Rising Incidence:** As populations of species like leopards and elephants increase or are displaced, HWC has surged, especially in districts adjoining forests (e.g., Lakhimpur Kheri, Saharanpur). Crop depredation, livestock lifting, and human fatalities are common [14, 30].

**2. Legal and Compensatory Framework:** The WPA and state guidelines provide for ex-gratia compensation for

injury, death, and crop damage. However, studies indicate inordinate delays and complex bureaucratic procedures in disbursement, exacerbating local resentment [15, 30].

**3. Assessment:** Legal framework is inadequate. The reactive compensation-centric approach is insufficient. Proactive legal measures for securing corridors, community-based conflict management, and rapid-response teams are underdeveloped in both law and practice.

**5. Institutional and Financial Capacity**

**1. Staffing and Infrastructure:** Vacancies in frontline forest guard positions (~30% as per CAG 2021) and lack of modern equipment (vehicles, communication devices) impede effective patrolling and law enforcement [8, 32].

**2. Budgetary Allocation:** The state's allocation for wildlife remains a small fraction of the total forest budget, with heavy dependence on central schemes like Project Tiger and Project Elephant [3, 32].

**3. Assessment:** Institutional capacity undermines legal effectiveness. Laws cannot be implemented without adequate human and financial resources.

**Role Of Judiciary And Civil Society**

**1. Judicial Activism:** Courts have played a pivotal role. The National Green Tribunal has intervened in cases of illegal mining in the Sonbhadra elephant zone and pollution in the Chambal [17, 18]. The Allahabad High Court has monitored encroachment removal in PAs [26].

**2. Community Engagement:** The WPA amendment of 2006 introduced the concept of Conservation Reserves and Community Reserves [2], but their uptake in UP has been limited. NGO initiatives, like those by the World Wide Fund for Nature (WWF) in Terai, demonstrate the potential of collaborative monitoring and anti-poaching efforts [19, 33].

**3. Assessment:** Judiciary acts as a vital corrective; community engagement remains an underutilized legal tool.

### Discussion: Synthesis Of Findings

The effectiveness of wildlife laws in UP is heterogeneous and context-dependent. The framework is potent on paper and has yielded significant conservation wins in isolated, high-value landscapes. However, its overall effectiveness is diluted by:

1. **Siloed Implementation:** Laws are applied to PAs in isolation, not across ecological landscapes <sup>[20, 24]</sup>.
2. **Weak Intra-Governmental Coordination:** Lack of synergy between forest, revenue, police, and infrastructure departments <sup>[23]</sup>.
3. **Societal Trade-offs:** Conservation laws are often perceived as restrictive by local communities without adequate participatory benefits, leading to compliance deficits <sup>[21, 33]</sup>.
4. **Evolving Threats:** Climate change and zoonotic disease risks are not adequately addressed by the current legal regime <sup>[22]</sup>.

### Conclusion And Recommendations

Uttar Pradesh's wildlife conservation laws have prevented catastrophic biodiversity loss but are not achieving their full potential. To bridge the gap between legislative intent and ground reality, the following measures are recommended:

1. **Strengthen Legal-Administrative Integration:** Establish a dedicated State Wildlife Crime Cell with legal and forensic expertise to improve investigation and prosecution <sup>[12]</sup>.
2. **Secure Ecological Corridors:** Use legal instruments like conservation easements and notify Critical Wildlife Habitats under the Forest Rights Act, 2006, to legally protect corridors <sup>[9, 20]</sup>.
3. **Reform HWC Management:** Legislate for a state-level HWC mitigation strategy mandating rapid compensation, insurance schemes, and investment in physical barriers (solar fences, trip alarms) <sup>[14, 15]</sup>.
4. **Enhance Capacities:** Fill vacancies, invest in modern surveillance technology (camera traps, drones), and provide continuous legal training to frontline staff <sup>[8, 32]</sup>.
5. **Promote Community-Centric Governance:** Legally empower and fund Joint Forest Management Committees and Biodiversity Management Committees in buffer zones for co-management <sup>[21, 27, 31]</sup>. Ultimately, the effectiveness of laws will depend on moving beyond a purely regulatory paradigm to an inclusive, resilient, and adaptive ecosystem-based governance model <sup>[22, 24]</sup>.

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