# CONSERVATION OF RAPTORS IN INDIA

Project Report (First Phase): 2021-2025

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**Reporting Period (First Phase):**

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**Bird in front cover page:**
Changeable hawk-eagle

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Tawny eagle

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White-eyed buzzard

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# PARTNERS

Karnataka Forest Department

Government of Rajasthan
Forest Department

बिहार सरकार

GOA FOREST DEPARTMENT
गोवा वन विभाग

Cinereous vulture

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# A. BACKGROUND

WWF-India launched the Raptor Conservation Programme in 2021, with financial support from the Raptor Research and Conservation Foundation (RRCF), to build a long-term, landscape-focused approach to safeguarding India's raptors. It aimed to strengthen the conservation of raptors across selected landscapes in the country through a multi-pronged approach. The programme focused on generating current and verified information on raptor distribution across terrestrial landscapes, wetlands, river stretches, and coastal areas, enabling targeted conservation actions. One of the first priorities of the programme was to fill key knowledge gaps on raptor populations, distribution, habitats, threats, behaviour, and ecology, laying the foundation for more informed management decisions. Additionally, the programme aimed to develop and strengthen conservation strategies and policies for raptors at the national level. A key component also involved enhancing awareness and understanding among stakeholders to foster broader public support for raptor conservation. The activities of the Raptor Conservation Programme aimed to fulfill the following four objectives:

1. **Conduct and support raptor research and monitoring**

- Status of threatened species of raptors, their distribution, abundance, breeding ecology and habitats with a particular focus on vultures, including the white-rumped, Indian, slender-billed, and red-headed vultures
- Role of raptors in zoonotic disease transmission, with special reference to human well-being
- Interface of wetland habitats and raptors to assess the importance of raptors as indicators of wetland health and human wellbeing
- Raptors and other species interactions - direct and indirect interdependency between raptors and other associated species in select ecosystems
- Significance of raptors in culture and tradition

2. **Promote landscape-scale raptor conservation**

Aligning with the Government of India's National Wildlife Action Plan, 2017-2031, develop and implement a range of actions and engagements including working with local communities, governments, veterinary agencies, and others to develop holistic solutions that will support the recovery and conservation of raptor populations in the Himalayas, Central and Western India, Terai and Western Ghats landscapes.

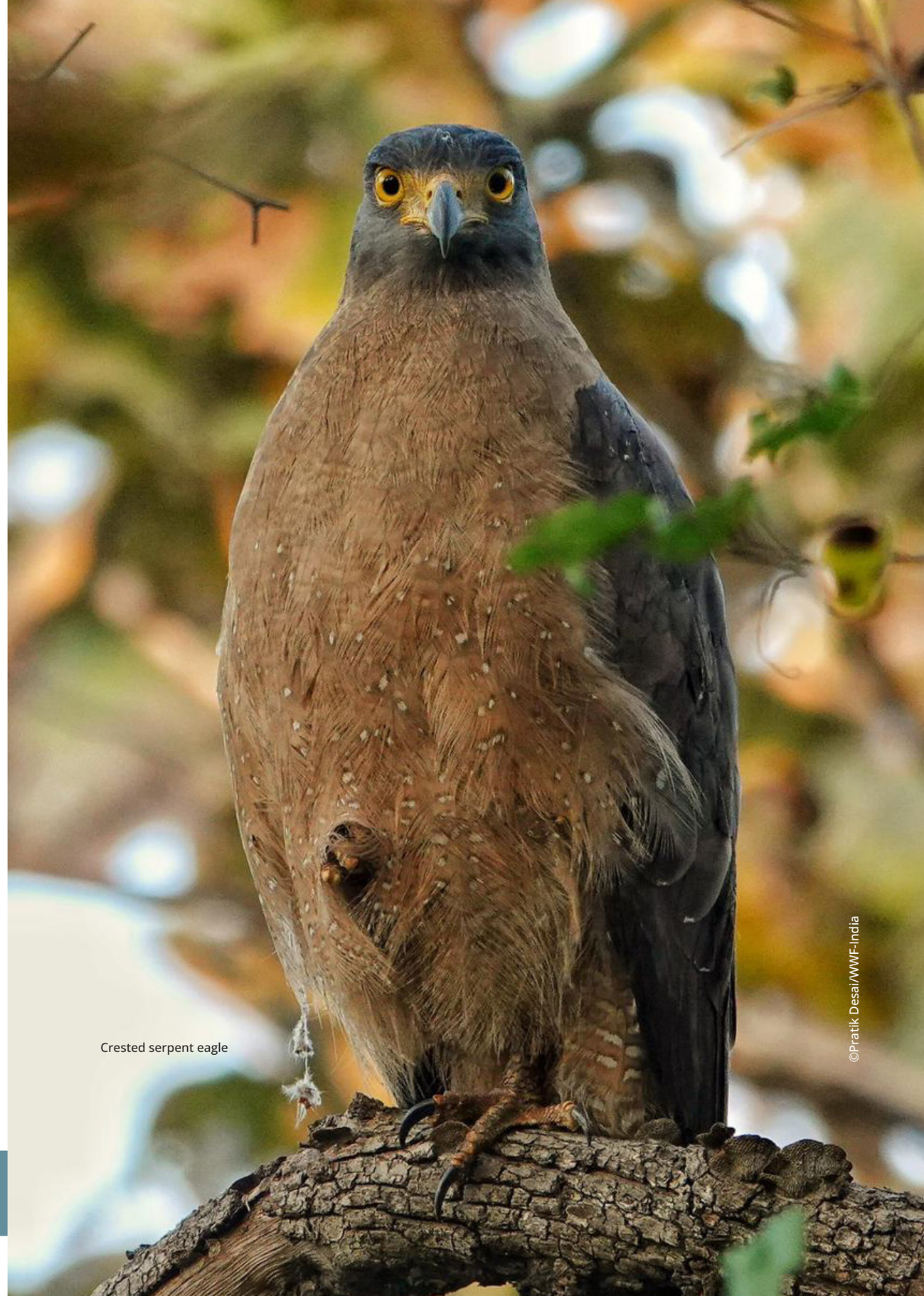
3. **Support development and implementation of national and regional policies for conserving raptors and their habitats**

Aligning with the Government of India's Working with state governments, Ministry of Environment, Forest & Climate Change, and other relevant agencies to develop, revise, and implement policies that promote raptor conservation not just in India but also internationally through strengthened cooperation with countries along raptor stopover spots and migration habitats, under the aegis of the Convention on Migratory Species.

4. **Develop strong and effective communication and information for raptor conservation**

Aligning with the Government of India's Develop and implement a communications strategy on raptors and their conservation to elevate the profile of RRCF and raptors. Facilitate the understanding of raptor conservation for enhanced support from civil society and governments, using a combination of social media, online and other campaigns and a range of outreach strategies.

This report covers the implementation status of the above activities and impact achieved across the project duration in brief.



Crested serpent eagle

# B. KEY ACHIEVEMENTS

## Advancing Policy Action, One Health Priorities, and Raptor-Safe Landscapes

WWF-India's Raptor Conservation Programme made major strides in advancing science-led, One Health–aligned conservation of vultures and other raptors across multiple states. Over the project period, the programme, in close collaboration with the Forest Departments, strengthened institutional partnerships, generated ecological data, and catalysed policy action to promote raptor-safe landscapes anchored in safe habitats and safe food. Joint efforts with the Forest Departments of Rajasthan, Assam, Karnataka, Uttarakhand, and Madhya Pradesh resulted in strong buy-in and formal integration of raptor priorities into state management processes. Extensive monitoring of vulture nests, state-wide raptor surveys, and capacity building of frontline staff—undertaken with Forest Department leadership—created reliable baselines for long-term conservation. Telemetry insights, generated and reviewed with Forest Departments, informed targeted mitigation measures and spurred coordinated state action on monitoring NSAIDs in the livestock carcass value chain. Together, these collaborative achievements lay a strong foundation for systemic raptor conservation in India.

### 1. Strengthening Stakeholder Collaborations for Systemic Conservation Action

Partnerships were strengthened in Rajasthan, Assam, and Karnataka—states that host high diversity of resident, migratory, and globally threatened raptor species. WWF-India's consultations with senior Forest Department officials in these states resulted in formal commitments to implement raptor conservation actions both within and outside Protected Areas. These engagements with the Forest Departments also highlighted the One Health relevance of raptors, particularly vultures, by underscoring their role in carcass disposal, disease-risk mitigation, and healthy livestock–wildlife interfaces. The strengthened buy-in from the Forest Departments lays the groundwork for embedding raptor conservation priorities into state management plans.

### 2. Building Evidence Systems to Inform State Decision-Making

Monitoring of over 450 vulture nests across 34 colonies in Madhya Pradesh, Uttarakhand, and Rajasthan—conducted with the respective Forest Departments—generated key insights on habitat safety, breeding success, and food availability. Regular field sessions and classroom training significantly strengthened the monitoring capacity of Forest Department staff. The resulting datasets are being integrated into a knowledge-management and decision-support system (DSS) to support evidence-based planning by Forest Departments and other state agencies. This joint effort was recognised at the Uttarakhand State Wildlife Board meeting, where the Hon'ble Chief Minister released the telemetry insights and DSS prototype, signalling high-level endorsement for science-led, department-driven conservation action.

A capacity building training on raptors identification and vulture conservation programme led by Dr Shonali Ghosh, Director, KNP for 80 frontline forest staff at Kaziranga National Park & Tiger Reserve, Assam

### 3. Establishing Robust Baselines for Lesser-Known Raptors

Collaboration with the Madhya Pradesh Forest Department on tagging and releasing rescued and captive-bred vultures significantly advanced state commitment to creating raptor-safe landscapes anchored in the twin pillars of safe habitats and safe food. The long-distance movement of the tagged Eurasian griffon highlighted the importance of habitat connectivity and safer foraging corridors—insights made possible through joint field efforts with the Forest Department. Importantly, this evidence catalysed policy-led discussions with the Forest Department and allied agencies on monitoring NSAIDs across the livestock carcass value chain, a critical intervention to ensure uncontaminated food for vultures and to strengthen veterinary–ecosystem linkages central to One Health. This partnership has created a strong foundation for institutionalising raptor-safe landscape management in Madhya Pradesh and reinforces the role of the Forest Department as a key driver of systemic conservation action.

### 4. Mitigating Infrastructure Risks through stakeholder collaboration

Satellite tagging of eight threatened vultures revealed high-risk sites such as Langha Road in Dehradun, where convergence of carcass dumps and high-tension powerlines poses threats to scavenging birds. Evidence from telemetry prompted joint action by the Forest Department, District Administration, and UPCL, leading to the insulation of a 10-km high-risk stretch. This intervention reduces vulture mortality and prevents major power outages—estimated at nearly INR 50 lakhs per hour—demonstrating how coordinated action with the Forest Department advances both ecological safety and human systems under a One Health approach.

Dr Rohan Shringarpure interacting with Mr Subharanjan Sen, IFS, PCCF (WL) & CWLW MP and other senior Forest Department officials at the carcass disposal site near Halali Dam

On-ground raptor identification session for frontline forest staff in Rajaji Tiger Reserve.

### 5. Advancing Evidence-Based Action for Safe Habitats and Safe Food

Collaboration with the Madhya Pradesh Forest Department on tagging and releasing rescued and captive-bred vultures significantly advanced state commitment to creating raptor-safe landscapes anchored in the twin pillars of safe habitats and safe food. The long-distance movement of the tagged Eurasian griffon highlighted the importance of habitat connectivity and safer foraging corridors—insights made possible through joint field efforts with the Forest Department. Importantly, this evidence catalysed policy-led discussions with the Forest Department and allied agencies on monitoring NSAIDs across the livestock carcass value chain, a critical intervention to ensure uncontaminated food for vultures and to strengthen veterinary–ecosystem linkages central to One Health. This partnership has created a strong foundation for institutionalising raptor-safe landscape management in Madhya Pradesh and reinforces the role of the Forest Department as a key driver of systemic conservation action.

# C. ACTIVITIES IN DETAILS

## OBJECTIVE 1

## Conduct and support raptor research and monitoring

### Activities conducted during Year 1

i. Vulture nest monitoring was undertaken for 210 nests across 12 sites, which were identified jointly with the Rajasthan and Madhya Pradesh Forest Departments.

ii. Raptor monitoring was conducted at priority sites in close coordination with the Forest Departments, including Keoladeo National Park, Tal Chhapar Wildlife Sanctuary, Asan Conservation Reserve, Langha Road carcass dump, Haiderpur, Patan (Madhya Pradesh), and Harike Wildlife Sanctuary, to assess raptor occurrence and abundance, as well as existing and potential threats or disturbances, thereby enabling informed conservation decisions.

iii. To initiate the tagging work—in collaboration with the Uttarakhand Forest Department—Phase 1 reconnaissance surveys were conducted in March 2023 in Rajaji and Corbett Tiger Reserves to identify key roosting, foraging, and nesting sites of four species—white-rumped, red-headed, and Egyptian vultures, and Pallas's fish eagle. These surveys led to the successful capture and tagging of eight individuals from three vulture species.

Ms. Aishwarya Laghate conducting field-based training for forest staff at an Indian Vulture nesting site in Tamia

Ms. Aishwarya Laghate conducting field-based training for forest staff at an Indian Vulture nesting site in Geedhkanch, Veerangana Durgavati Tiger Reserve


'Bring back the vulture' poster released for the first time by Madhya Pradesh Forest Department at Van Vihar, Bhopal

### Activities conducted during Year 2

i. Vulture nest monitoring was completed at 25 sites during the 2023–2024 breeding season in collaboration with the Rajasthan, Madhya Pradesh, and Uttarakhand Forest Departments.

#### Madhya Pradesh

Over a three-year period beginning in 2021, high breeding success was recorded across several sites. Indian vultures achieved 100% success at multiple locations, while white-rumped vultures showed strong outcomes, particularly at Tindhni in Nauradehi Wildlife Sanctuary. In 2024, a total of 166 Indian vulture nests were observed across nine sites in Madhya Pradesh, with breeding success ranging from 60% in Gandhisagar to 100% in Nilgay Tiraha and Bathan grassland of Bandhavgarh TR. Eighty-four white-rumped vulture nests were observed across three sites, of which 68 were productive, with breeding success ranging from 74% in Chiklod to 90% in Nauradehi WLS. Site-wise details and nest numbers are provided in **Tables 1, 2 and Annexure I.**

#### Rajasthan

Breeding success for Indian vultures varied across monitored sites: Bayana-2, Bayana-3, Damoh-1, Damoh-2, Damoh-3, Bhainsrorgarh-3, and Garadiya Mahadev achieved 100%; Bayana-1 achieved 92%; Gapernath 93%; and Bhainsrorgarh-1 and Bhainsrorgarh-2 recorded 83% and 80%, respectively. Of 109 monitored nests, 61 fledglings successfully fledged. Notably, seven sites recorded 100% breeding success (Table 3; Annexure 1). At Kala Khet in Bhainsrorgarh Wildlife Sanctuary, 15 nests were recorded, nine active—all of which were productive, marking a highly successful season.

#### Uttarakhand

In Uttarakhand, a white-rumped vulture colony in the Dhela range of Corbett Tiger Reserve was monitored. Fifteen nests—all on sal trees—were recorded, with 9 nestlings fledging, resulting in 60% breeding success.

ii. Raptor monitoring at prioritised 'hotspots', selected using eBird and BirdLife data, continued to assess species occurrence, abundance, and threats. Fortnightly monitoring was carried out at Keoladeo National Park, Tal Chhapar Wildlife Sanctuary, Asan Conservation Reserve, Haiderpur Wetland, Patan, and Harike Wildlife Sanctuary between October 2022 and April 2023. Jodbeed Conservation Reserve was added as a priority site in November 2023. Across these sites, 52 raptor species were recorded, including endangered Egyptian vulture, steppe eagle, and Pallas's fish-eagle. All monitoring efforts were undertaken in coordination with the respective State Forest Departments, ensuring alignment with site-level management needs.

iii. Following the March–April 2023 reconnaissance surveys in Rajaji and Corbett Tiger Reserves—undertaken to locate key roosting, foraging, and nesting areas—sites were finalised for four threatened raptor species in consultation with the Uttarakhand Forest Department. Trapping activity began on 26 October 2023, involving trapping and tagging experts and WWF-India staff working closely with Forest Department field teams. Three raptors—two white-rumped vultures and one Egyptian vulture—were trapped, tagged, and released, with movements monitored remotely and through fortnightly field checks.

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A White-rumped vulture fitted with a 50 g GPS-GSM tag and released from the Dhela range, Corbett Tiger Reserve

## Activities conducted during Year 3

### Vulture nest monitoring

i. Vulture nest monitoring was conducted at 22 colonies in Madhya Pradesh, 11 colonies in Rajasthan, and 1 colony in Uttarakhand from November 2024, in collaboration with the respective State Forest Departments. A total of 377 nests in Madhya Pradesh, 89 nests in Rajasthan, and 18 nests in Uttarakhand were monitored periodically. Details of the nests monitored in Madhya Pradesh and Rajasthan are summarized in (**Annexure I**).

At each site, frontline Forest Department staff were trained to identify vultures and record nesting status during their visits. Overall nesting success of 78%, 82%, and 72.2% was observed at colonies in Madhya Pradesh, Rajasthan, and Uttarakhand, respectively. In Uttarakhand, 18 active nests were observed, of which 13 were successful, yielding a nesting success rate of 72.2%, an improvement from the previous year. In Madhya Pradesh, nesting success at colonies in Protected Areas was slightly higher than that outside Protected Areas (79% of 251 nests vs. 76% of 126 nests, respectively). In Rajasthan, the opposite was observed (81% of 69 nests vs. 85% of 20 nests, respectively). In Uttarakhand, all the monitored nests were within the Protected Area.

Mr. Pratik Desai conducting field-based training for forest staff at an Indian Vulture nesting site in Kuno National Park, MP

These nest monitoring insights suggest that nesting sites inside and outside Protected Areas provide adequate resources and safety to support nesting vulture populations in both states. An in-depth assessment of resource availability and safety, as well as local-level disturbances or conflicts at these sites, will be conducted during subsequent years in partnership with the Forest Departments to better understand their impact on the vulture population.

### Owl surveys

ii. Owl surveys were conducted in Keoladeo National Park in May 2024 (summer) and September 2024 (monsoon) in coordination with the Rajasthan Forest Department to collect data on the seasonal presence and distribution of owls. The survey aimed to gather essential data on the presence and distribution of these species across seasons. Four owl species – barn owl, spotted owlet, Indian scops-owl, and dusky eagle-owl – were recorded (**Annexure II**).

Mr. Pratik Desai conducting owl surveys along with WWF-India and Forest Department staff at Keoladeo National Park, Rajasthan

### State-wide raptor surveys

iii. A systematic state-wide raptor survey was conducted in close collaboration with the Rajasthan Forest Department within and outside Protected Areas and Conservation Reserves of Rajasthan from November 2024 to March 2025 to establish a baseline of raptor species richness and abundance in the state for subsequent monitoring and conservation efforts. More than 20 expert birders—including WWF-India staff, senior experts, freelancers, consultants, and volunteers—participated. During this exercise, all 50 districts and 67 Protected Areas and Conservation Reserves of Rajasthan were covered in two phases with active facilitation by the Forest Department. A total of 48 resident and wintering raptor species were recorded in various habitats (**Annexure III**).

iv. A comprehensive state-wide raptor survey was carried out in partnership with the Uttarakhand Forest Department across Uttarakhand from April to June 2025 to document raptor species diversity, distribution, and abundance, laying the groundwork for long-term conservation and monitoring. The exercise covered all 13 districts, including systematic sampling across 12 Protected Areas in the state, with logistical and field support from the Forest Department. A dedicated team of 21 individuals—including expert birdwatchers, WWF-India staff, freelancers, consultants, and volunteers—participated in this effort.

The survey spanned a wide range of habitats—from the Terai grasslands to mid-altitude forests and high-altitude zones—and led to the recording of 40 resident and migratory raptor species (**Annexure IV**), with nesting records of white-rumped vulture, Egyptian vulture, Indian spotted eagle, Himalayan vulture, bearded vulture, black eagle, shaheen falcon, Pallas's fish eagle, and lesser fish eagle.

v. A reconnaissance survey of raptors to initiate a baseline understanding of raptor species in 10 divisions of Upper Assam was conducted in December 2024 in close collaboration with the Assam Forest Department.

Employing the road transect method, the survey covered over 800 km and recorded more than 180 sightings of 30 raptor species across grasslands, Protected Area fringes, agricultural landscapes, wetlands, rivers, and other waterbodies (**Annexure V**). This survey also strengthened coordination with Forest Department officials, laying the foundation for future Protected Area surveys and supporting the identification of raptor hotspots in Assam for targeted conservation action.

### Area specific raptor surveys

vi. A raptor survey in the Coimbatore Forest Division (February 2025), undertaken in partnership with the Tamil Nadu Forest Department, used systematic road transects (300 km) and 47 observation points to document 202 sightings of 25 raptor species (**Annexure VI**). By integrating Sentinel-2 LULC data with GPS observations, the survey mapped raptor activity and habitat use across the division. High-activity zones were recorded in Karamadai and Bolampatty, with additional medium-activity areas in Bolampatty, Madukkarai, Mettupalayam, and Sirumugai. Tree-dominated habitats supported the highest species diversity (21 species), followed by rangelands (12) and croplands (9), whereas built-up areas and waterbodies supported fewer species. These insights—generated jointly with Forest Department teams—create a critical baseline for targeted raptor conservation in the region.

Raptor survey in Coimbatore is being conducted by WWF-India staff, volunteers, and Forest Department staff

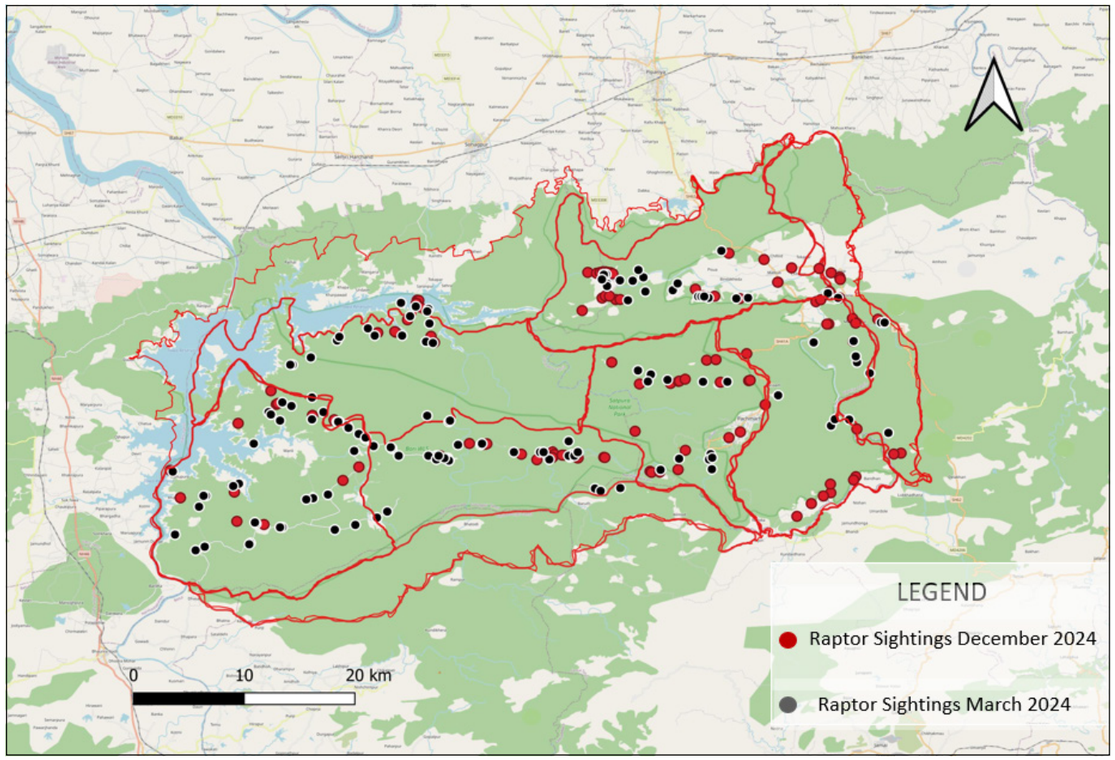
vii. A winter raptor survey across all ranges within the core zone of Satpura Tiger Reserve, conducted in collaboration with the Madhya Pradesh Forest Department, was carried out in December 2024 to assess spatio-temporal variations in raptor species richness and abundance in comparison to the previous survey in March 2024. The trend in raptor sightings differed between the two surveys (**Annexure VII**), suggesting a possible seasonal influence on habitat preference for certain species, although overall species richness in the core ranges remained comparable (27 species in March 2024; 28 species in December 2024). These preliminary insights—generated jointly with the Forest Department—will be strengthened through detailed habitat assessments of the forest ranges to examine seasonal changes in vegetation type, tree composition, and resource availability, enabling a better understanding of how these factors influence raptor population dynamics (**Map 1, Figure 1**).

An Egyptian vulture being released by WWF-India staff after fitting it with a satellite tag

©Navin K. Das/WWF-India

A red-headed vulture tagged in Rajaji Tiger Reserve, Uttarakhand






**Map 1:** Spatial distribution of raptor sightings in the six core ranges of Satpura Tiger Reserve, Madhya Pradesh.

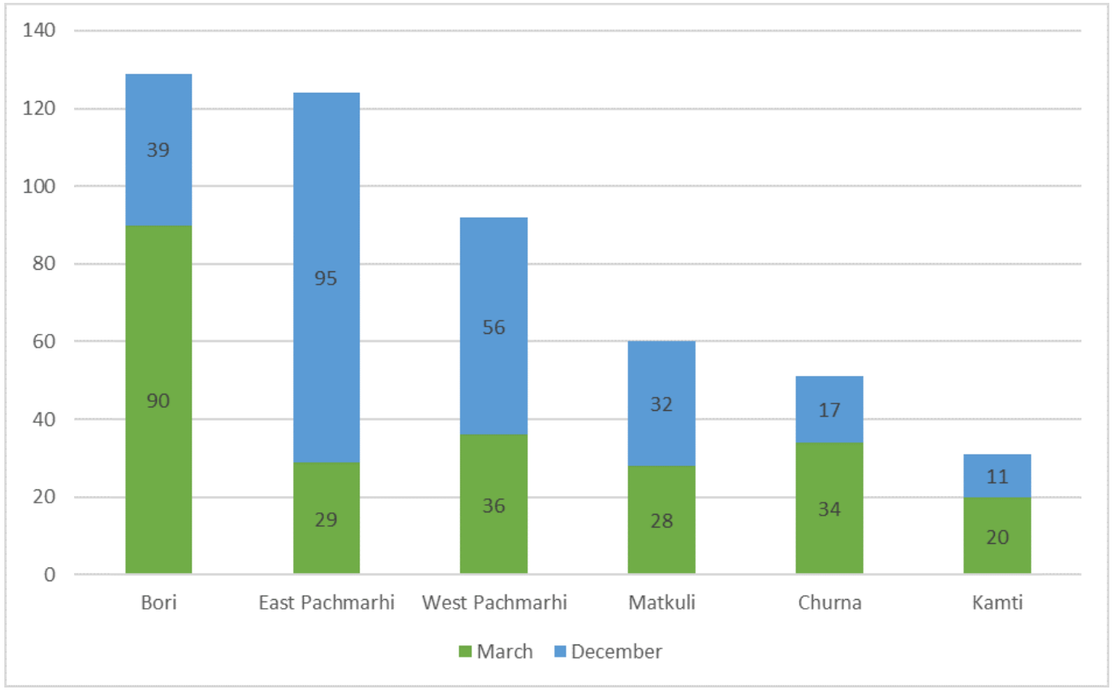



**Figure 1:** Number of raptors recorded during surveys conducted in March and December 2024 across six core ranges of Satpura Tiger Reserve, Madhya Pradesh.

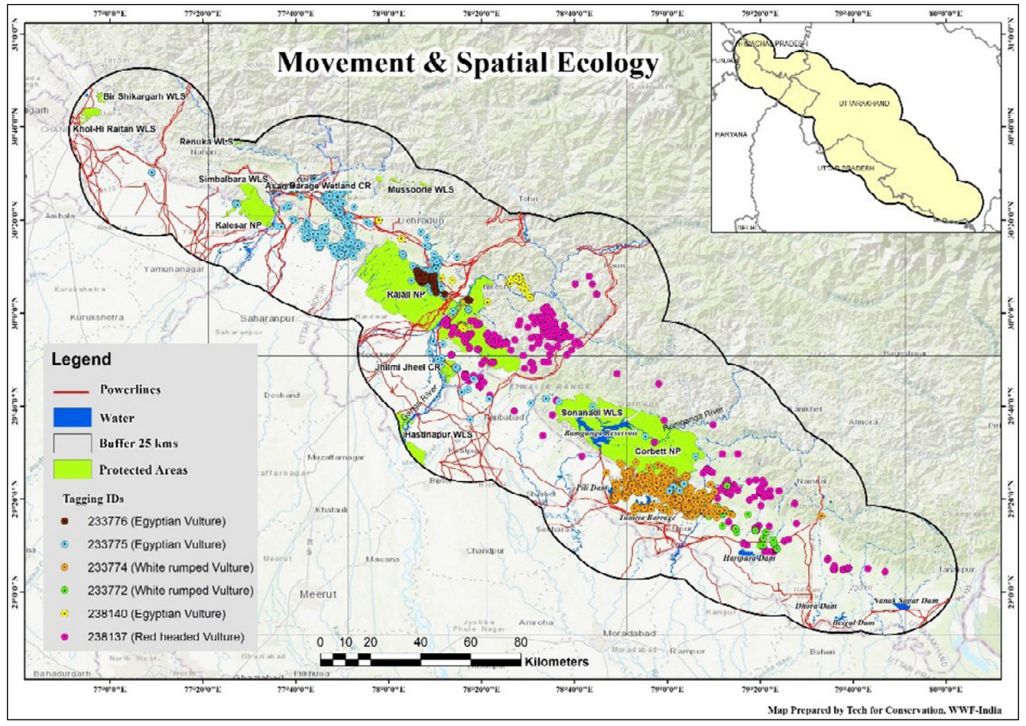
viii. During the reporting period of the satellite tagging and monitoring activity (November 2023–April 2025), two additional Egyptian vultures and two red-headed vultures were captured and tagged, expanding the programme's tracked population. All vultures tagged between November 2023 and April 2025 were monitored through satellite-transmitted movement data supported by targeted ground-truthing carried out in collaboration with the Uttarakhand Forest Department. The data showed clear clustering patterns in frequently used habitats (Map 2). For Egyptian vultures, repeated use of areas with dense powerline networks indicated a potential electrocution risk (Map 3). Ground verification by WWF-India and Forest Department teams further confirmed a nesting colony of white-rumped vultures inside Corbett Tiger Reserve, along with active feeding sites for Egyptian and red-headed vultures. These insights strengthen our understanding of landscape-level use and inform targeted mitigation and protection efforts undertaken jointly with the Forest Department.

ix. A report on the preliminary insights from the satellite-tagged birds was released by the Honourable Chief Minister of Uttarakhand during the State Wildlife Board meeting in May 2025, along with the Honourable Forest Minister and senior officials of the Uttarakhand Forest Department, underscoring strong institutional support for continued monitoring and conservation action.

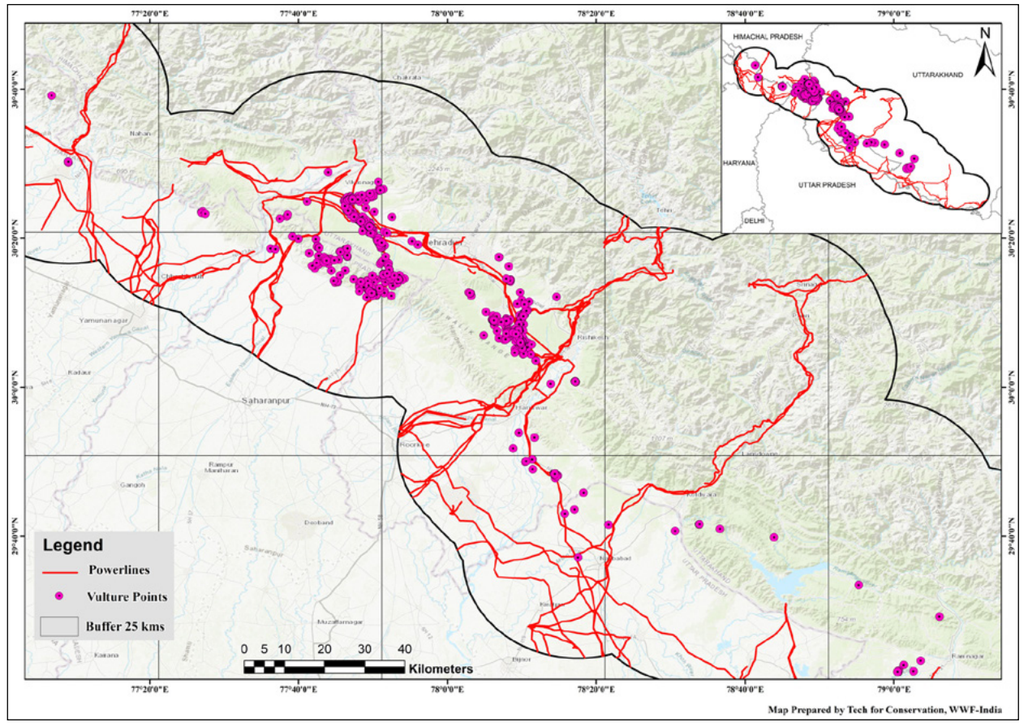
x. Vulture survey results show that birds frequently use areas outside protected zones, highlighting the need for targeted interventions to ensure safe food sources. Surveys across 44 villages of Madhya Pradesh, Rajasthan, and Uttarakhand found 31% of cattle owners use vulture-toxic NSAIDs, while another 31% use safe drugs. Immediate action is needed to reduce toxic NSAID use, raise awareness, and collaborate with civil administration and Forest Department officials to promote safe alternatives in vital vulture areas.

WWF-India's report on satellite telemetry of raptors being released by Honourable Chief Minister Shri Pushkar Singh Dhami and Honourable Minister of Forests, Shri Subodh Uniyal, and other senior government officials of Uttarakhand






**Map 2:** Movement maps of the satellite-tagged vultures showing the home range with added layers on water bodies, protected areas, and powerlines.




**Map 3:** Movement map of tagged Egyptian vulture focusing on its movement along powerlines.

# OBJECTIVE 2

## Promote landscape-scale raptor conservation

### Activities conducted during Year 1

i. Capacity building of frontline Forest Department staff and nature guides on vulture nest monitoring as well as raptor identification, and documentation of nesting success and failure of nesting was conducted in three states:

   a. Madhya Pradesh Forest Department: A total of 76 staff were trained in 37 sessions at five sites.

   b. Punjab Forest Department (Harike Wildlife Sanctuary): Eight forest staff were trained in one session.

   c. Uttar Pradesh Forest Department (Haiderpur Wetlands): Ten nature guides were trained in identifying raptors and monitoring them, in collaboration with local forest officials.

ii. Awareness sessions on raptor conservation were organised near the monitoring sites in collaboration with the Madhya Pradesh and Uttarakhand Forest Departments. The target group for these sessions covered primary school to post-graduate students, community representatives, village heads, and tourist guides. Over 200 people participated across five such sessions.

Training session for Forest Department staff in Madhya Pradesh

Training Session for Forest Department Staff and Communities in Valsad, Gujarat


Awareness program for school students in Valsad, Gujarat, during International Vulture Awareness Day



### Activities conducted during Year 2

i. Capacity building of frontline staff and nature guides on vulture nest monitoring, raptor identification, and recording nesting success and failure was completed in three states. Between April 2023 and January 2024, ten sessions were conducted across Madhya Pradesh, Uttarakhand, and Assam, during which 267 forest guards were trained.

ii. Awareness sessions on raptor conservation were organised near the monitoring sites in Madhya Pradesh, Rajasthan, Assam, and Uttarakhand. The target groups for these sessions included primary to post-graduate students, community representatives, village heads, and tourist guides. Over 2,500 people were reached across five sessions.

Orientation session for Forest Department staff at Garbhanga Forest Reserve, Assam

Orientation-cum-knowledge assessment session for staff at Assam Forest Training School, Jalukbari

Interaction with school students on raptor conservation at Tal Chappar, Rajasthan

Shikra

©Aparnathi Chetan

## Activities conducted during year 3

i. The RCP team refined its strategy for establishing raptor-safe landscapes across India based on extensive stakeholder consultations, including sustained engagement with State Forest Departments, and expert feedback (**Figure 2**). The strategy is structured around four main workstreams:

   a. Understanding movement, habitat use, and breeding ecology: This includes activities to gather and analyse data on raptor population dynamics, foraging and breeding ecology, population genetics, and ecological interdependence to guide conservation actions. These efforts are being undertaken in close collaboration with Forest Department field teams, whose site-level knowledge strengthens data accuracy and long-term monitoring.

   b. Threat reduction and disease prevention: Identification and mitigation of key risks—including NSAID usage, habitat loss, linear infrastructure impacts, targeted and non-targeted poisoning, poor solid waste management, and disease transmission between competing scavengers. Mitigation actions are developed and implemented jointly with State Forest Departments and allied agencies to ensure landscape-level effectiveness.

   c. Fostering community stewardship: Strengthening local community institutions such as Panchayats to promote community-based raptor monitoring and conservation, with Forest Department staff actively participating in mobilising communities and integrating local insights into conservation planning.

   d. Strengthening stakeholder capacity: Augmenting the skills of Forest Department frontline staff through targeted trainings, and enhancing citizen engagement through citizen science–led monitoring and outreach programmes. These capacity-building initiatives have deepened departmental ownership and positioned Forest Departments as central actors in sustaining raptor-safe landscapes.

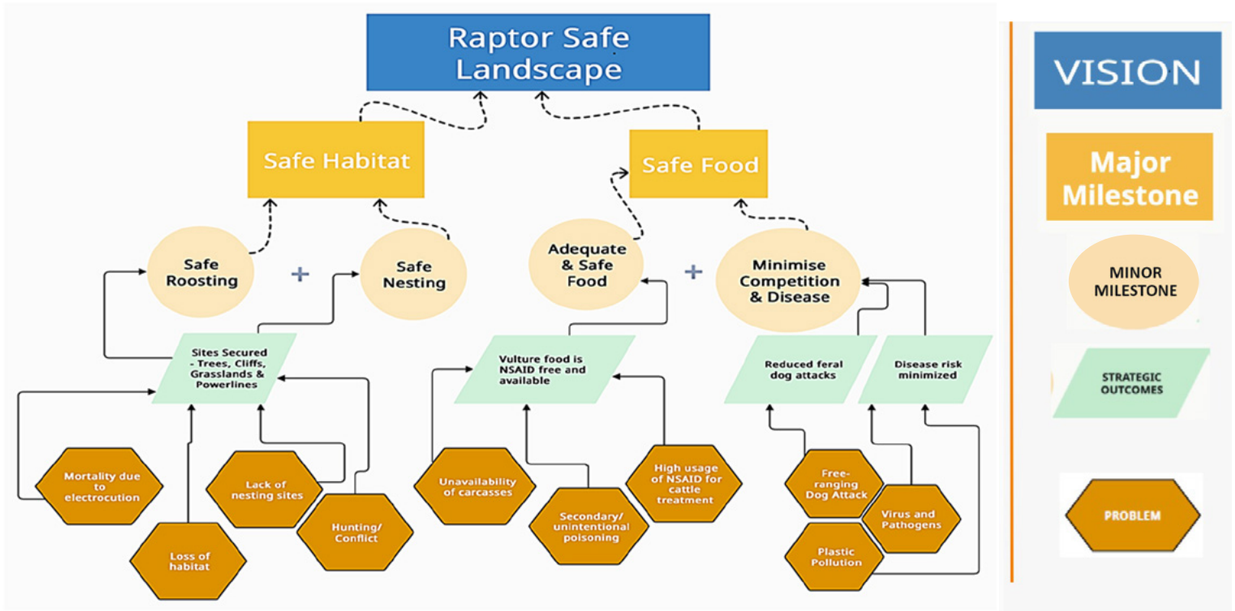



**Figure 2:** Theory of Change illustrating WWF-India's pathway to securing safe habitats and safe, toxin-free food sources for raptors through the Raptor Conservation Programme.



The strategy was tailored for implementation in Assam, Rajasthan, Madhya Pradesh, Uttarakhand, Karnataka, and Tamil Nadu, in close collaboration with the respective State Forest Departments, resulting in an action plan that secured broad stakeholder buy-in. These action plans have been formally approved through Government Orders issued by the Chief Wildlife Wardens and State Forest Departments of Assam, Rajasthan, and Karnataka.


Meeting with senior officials of the Rajasthan Forest Department to formulate a strategy to establish raptor-safe landscapes in Rajasthan

Meeting with Ms Supriya Sahu, IAS, additional chief secretary (forests), Tamil Nadu


Participants of the workshop to establish raptor-safe landscapes in Rajasthan


Participants of the workshop to establish raptor-safe landscapes in Assam

# OBJECTIVE 3

## Support development and implementation of national and regional policies for conserving raptors and their habitats

### Activities conducted during Year 1

Meetings were held with the Ministry of Environment, Forest and Climate Change (MoEF&CC), in consultation with senior Forest Department officials, to develop Guidelines for Creating Vulture Feeding Sites.

The Ministry provided detailed feedback, which was incorporated into the draft guidelines. The discussions reflected strong institutional support and alignment with national vulture conservation priorities, including those of the State Forest Departments implementing vulture conservation on the ground.

### Activities conducted during Year 2

The guidelines for creating vulture feeding sites were finalised with inputs from the MoEF&CC and the State Forest Departments, and, upon approval, were titled “Guidelines for Developing Supplementary Feeding Sites for Wild Vultures in India”.

WWF-India was among three organisations invited to review the “Action Plan for Vulture Conservation in India,” alongside senior Forest Department representatives. Following the review meeting at the Ministry on 1st November 2023, it was agreed to incorporate the above guidelines for creating vulture feeding sites into the updated version of the Action Plan, reinforcing their adoption by Forest Departments across states.

### Activities conducted during Year 3

i. The Government of India’s Vulture Conservation Action Plan (2020–2025) provides a national framework for protecting vulture populations through focused conservation initiatives, habitat management, and multi-stakeholder collaboration involving the State Forest Departments at the frontline. In alignment with this framework, the WWF-India RCP team organised a workshop with the Rajasthan Forest Department to develop an action plan for creating raptor-safe landscapes in the state.

The workshop facilitated discussions on ecological challenges, management practices, and stakeholder coordination between WWF-India and Forest Department officials, including frontline forest staff. The resulting plan complements and reinforces the objectives of the national Vulture Conservation Action Plan. Building on this approach, the RCP team aims to replicate similar processes in other states in partnership with their respective Forest Departments.

Exposed jumper wires of the powerline which are most likely to electrocute the birds

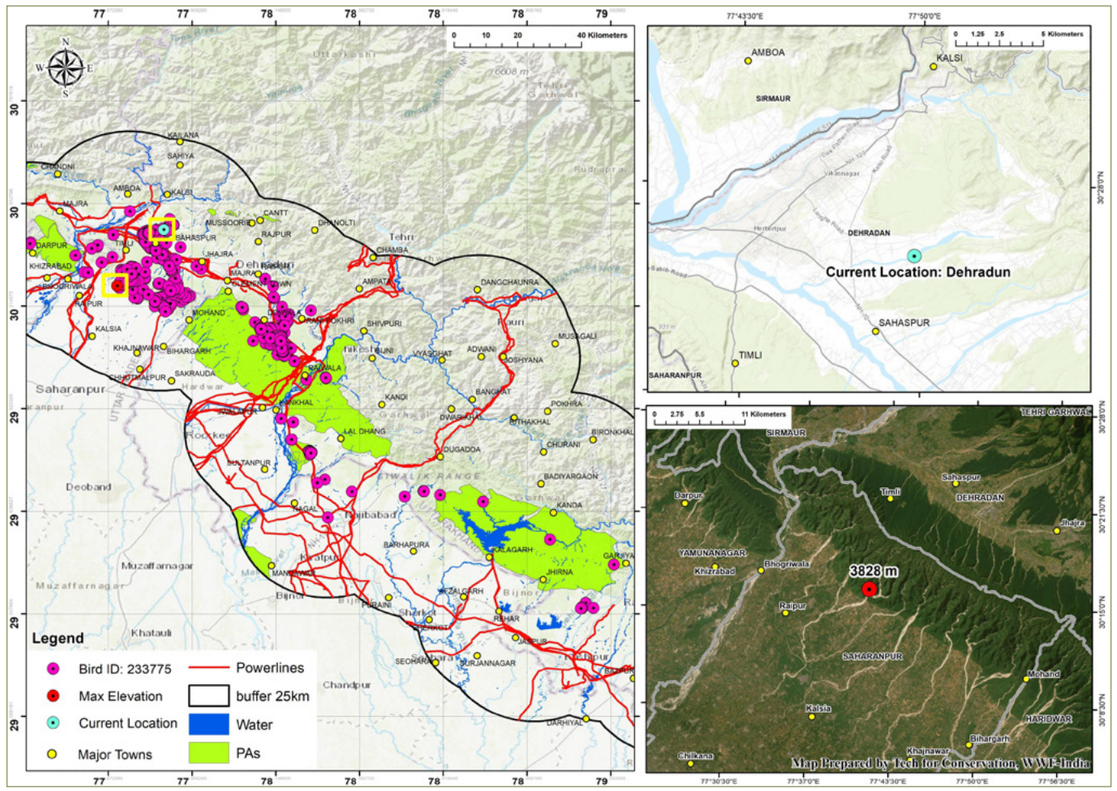
Egyptian vultures perched precariously close to the non-insulated jumper wires of power lines

©Sunny joshi/WWF-India



ii. A survey conducted in October 2024 at Jodbeed Conservation Reserve, Bikaner, in close coordination with the Rajasthan Forest Department, assessed the impact of waste, primarily plastic, on scavenging raptors. Among 554 samples, 17,030 kg of gut remains were examined, revealing significant plastic, organic matter, and cloth contamination (**Annexure VIII**). Observations by frontline forest staff and community interviews highlighted that unmanaged waste at carcass dumps poses serious health risks to raptors and contributes to wider environmental and public health hazards. These findings underscore the need for urgent, coordinated action, adopting a One Health approach that brings together local authorities, Forest Department officials, veterinary and waste-management departments, and conservation stakeholders to improve waste handling practices, reduce risks to raptors, and support research on the ecological and health impacts of plastic ingestion.

iii. Based on insights from the satellite telemetry study in Uttarakhand and field verification by frontline forest staff, the RCP team convened high-level multi-stakeholder meetings with Uttarakhand Forest Department officials to address raptor electrocution and collision risks at important foraging sites for vultures. A key outcome of these engagements was the retrofitting of powerline insulators along a 5 km stretch identified as highly vulnerable, significantly reducing the risk of electrocution (Map 4). Following this success, the Uttarakhand Forest Department requested WWF-India’s support in identifying additional electrocution pinch-points across the state. This collaboration is now helping position raptor safety more prominently within the state’s Forest Department–led linear infrastructure and powerline management policies, creating long-term safeguards for threatened species.




**Map 4:** Movement of satellite tagged-Egyptian Vulture (EV-1)

iv. To strengthen conservation efforts under the Central Asian Flyway (CAF), a structured Delphi-based expert consultation was initiated to gather insights from key stakeholders across policy, research, and implementation domains, including state Forest Department officials and frontline forest staff where relevant. The consultation sought to identify gaps, funding limitations, and challenges in site-level implementations. This process involved developing a comprehensive questionnaire to benchmark CAF conservation strategies against global best practices, prioritise policy interventions, and generate consensus-driven recommendations for improving coordination, monitoring, and long-term resilience of migratory bird habitats. The resulting recommendations will support the formulation of an evidence-based CAF strategy for India in close collaboration with the Forest Departments of CAF-range states.


An Egyptian vulture perched on top of a heap of plastic waste present in the gut of livestock carcasses, exposing avian scavengers to a potential health risk from plastic ingestion


Assessment of the extent of plastic waste in livestock carcasses at Jodbeed Conservation Reserve, one of the most important sites for both resident and wintering raptors



# OBJECTIVE 4

## Develop strong and effective communication and information for raptor conservation

### Activities conducted during Year 1

i. Approximately 9,000 brochures, posters and pamphlets on India's nine vulture species and fifteen threatened raptors were published and distributed. These materials, which included species identification, threats and conservation actions, were circulated amongst birders, scientists, and Forest Department officials and frontline forest staff. "Bring back the vultures" posters were released on International Vulture Awareness Day. The posters are in Hindi, English, Assamese, Gujarati, Marathi, Tamil, Telugu, Kannada and Malayalam. Brochures, posters and pamphlets on 'Threatened Raptors of India' were also distributed across India (Annexure IX). These received highly positive feedback from the recipients, including state Forest Departments.

ii. A series of "Wings of Wonder" exhibitions were curated and installed in Delhi, Bhopal, Goa, Udaipur, Jaipur and Harike, and collectively drew more than 10,000 visitors during the year. The exhibitions showcased more than 60 of the 107 raptors reported in India and were attended by Forest Department officials, conservation practitioners, students, and the general public.

iii. A citizen science initiative was implemented in September of 2021 and 2022 in collaboration with Bird Count India. Three orientation sessions were conducted to train volunteers—including frontline forest staff and local Forest Department teams—in identifying vulture species and recording observations/sightings on the eBird application. WWF-India received 108 checklists in 2021 and 230 in 2022, with a notable increase in volunteer participation in the second Annual Vulture Count.

**Awareness was further amplified through radio, newspaper, and social media platforms, highlighting the ecological importance of raptors and ongoing conservation efforts in partnership with Forest Departments.**

Posters "bring back the vultures" and "threatened raptors of India" were released amongst school children

Session on raptor exhibition for college students at WWF-India's Delhi office

Inauguration of raptor exhibition by shri j.s. Chauhan, IFS, ex PCCF & CWLW, Madhya Pradesh and other senior forest officials at WWF-India Bhopal office

Raptor exhibition at Harike WLS, Punjab

## Activities conducted during Year 2

i. Over 12,000 brochures, posters and pamphlets on nine vulture species and fifteen threatened raptors of India were published and distributed. The brochures, having information on key identification, threats and conservation actions, were circulated amongst birders, scientists and Forest Department officials, including frontline staff engaged in monitoring across states. These received highly positive feedback from the recipients. Eagles of India brochures were published and distributed in May 2023. In November 2023, a new brochure on the Owls of India was printed and circulated across the country, including through State Forest Departments (**Annexure IX**).

ii. Exhibitions on raptors named "Wings of Wonder" were curated and installed in Delhi, two locations in Bhopal, Goa, two locations in Udaipur, Jaipur, Harike, and Kolkata (September 2024). The exhibitions showcased more than 60 of the 107 raptors reported in India. About 15,000 people visited the exhibition during this period, including Forest Department officials, frontline forest staff, and community stakeholders. A virtual 360° version of the exhibition was hosted on WWF-India's website and displayed through Virtual Reality headsets in Goa's annual bird festival, enabling outreach to audiences in remote areas, including forest staff and local conservation groups.

iii. The RCP team presented WWF-India's ongoing work on vulture nest monitoring and community engagement at two conferences. In January 2023, the WWF-India RCP team presented on the topic "Raptor Conservation in Madhya Pradesh with special mention on Vulture Conservation" during the 1st Conference on Lesser-Known Species of Madhya Pradesh at Bhopal, attended by senior Forest Department officials. In March 2023, the RCP team presented on "Role of local communities in vulture conservation" during the National Level Conference on Vulture Conservation and Reintroduction in Madhya Pradesh at Bhopal, which also included participation from Forest Department leadership and frontline officers

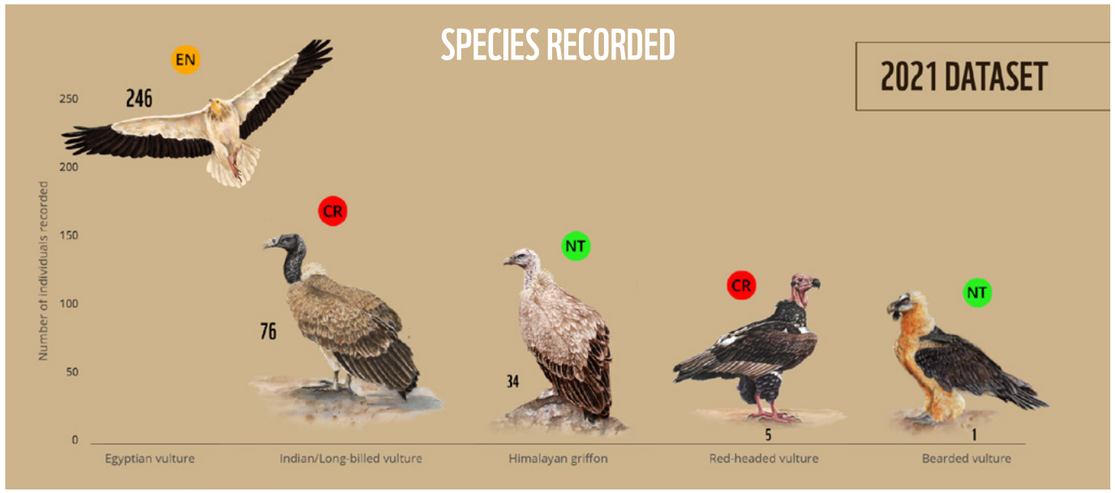
iv. The third edition of the Annual Vulture Count was conducted in September 2023 in collaboration with BirdCount India and with active participation of Forest Departments across multiple states. Two orientation sessions on 1st and 2nd September 2023 were organised to train 180 volunteers—including forest guards, frontline staff, and nature guides—for identifying vulture species and recording observations/sightings on the eBird application. WWF-India received over 180 checklists in the third year of Vulture Count, recording 1,305 individual vultures across participating states (**Figure 3**).

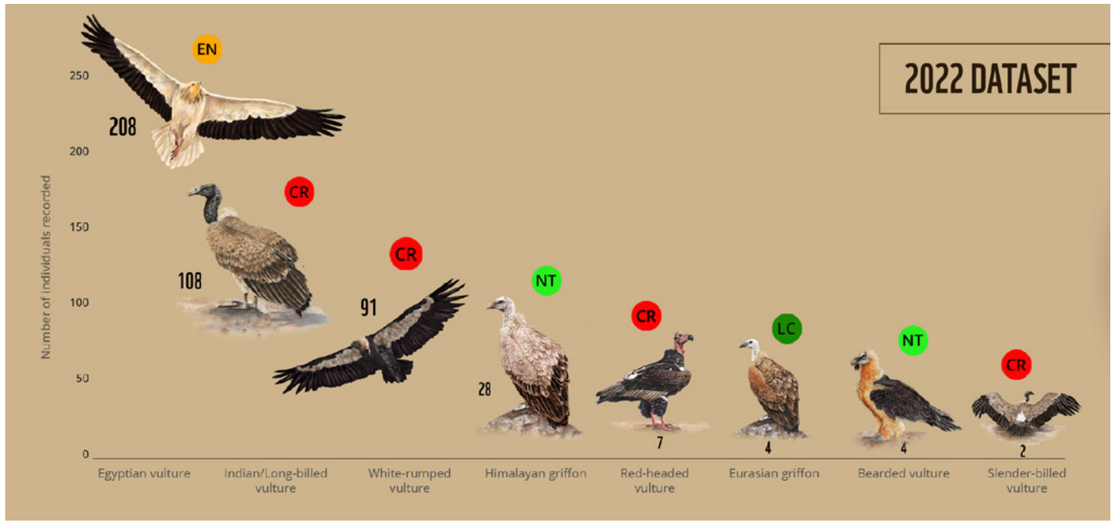
Orientation workshop on vulture identification and monitoring at Corbett Tiger Reserve, Uttarakhand


Students enjoying the virtual Raptor Exhibition at the Goa Bird Festival


The national conference on vulture conservation was a multi-stakeholder event involving the MP forest department, animal husbandry department, drug controlling authority, and civil society organisations





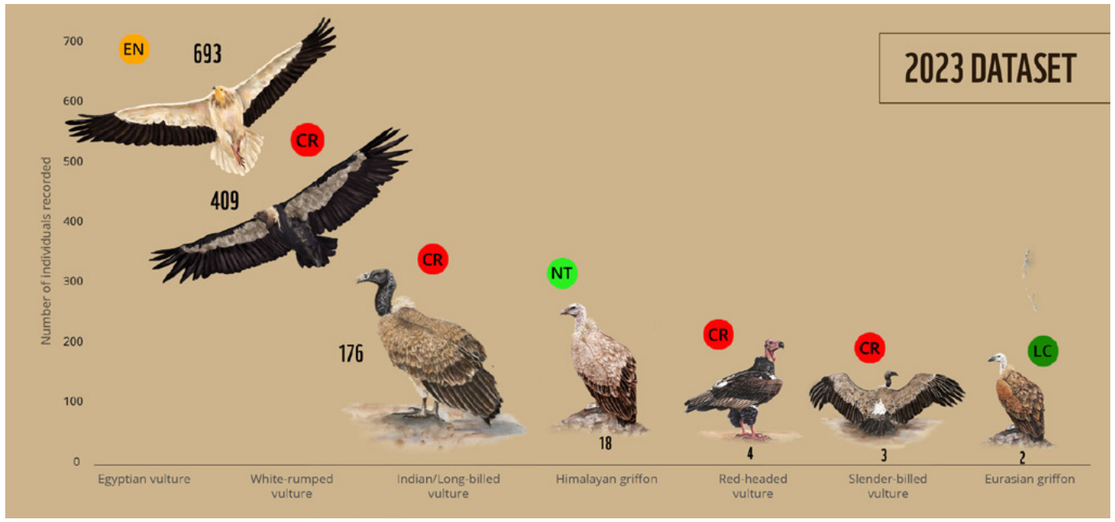




**Figure 3:** Snapshot of findings of Annual Vulture Count 2021–2023

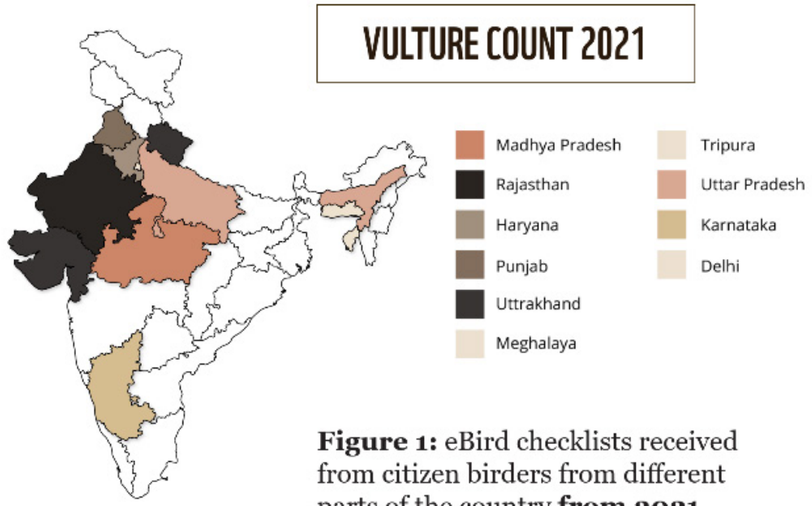



**Figure 1:** eBird checklists received from citizen birders from different parts of the country **from 2021**

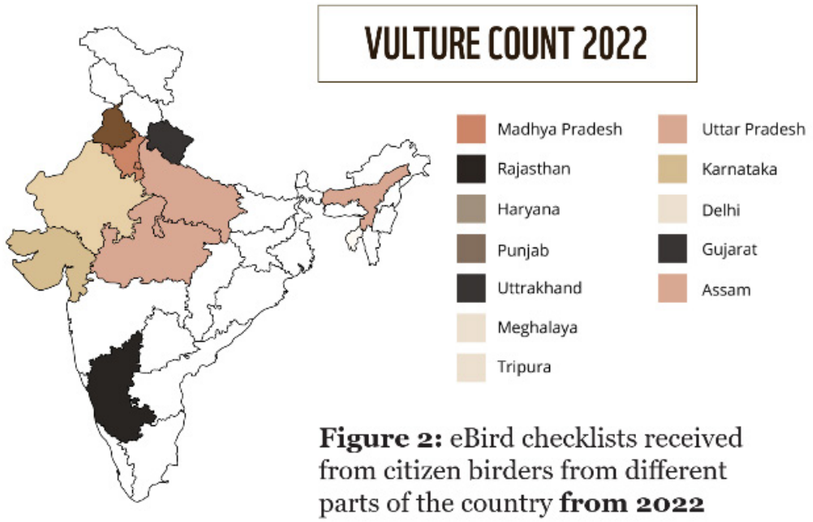



**Figure 2:** eBird checklists received from citizen birders from different parts of the country **from 2022**

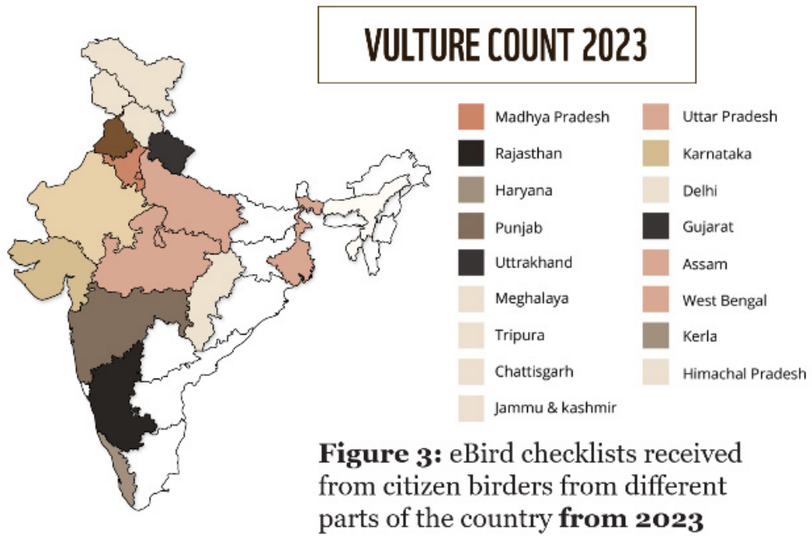
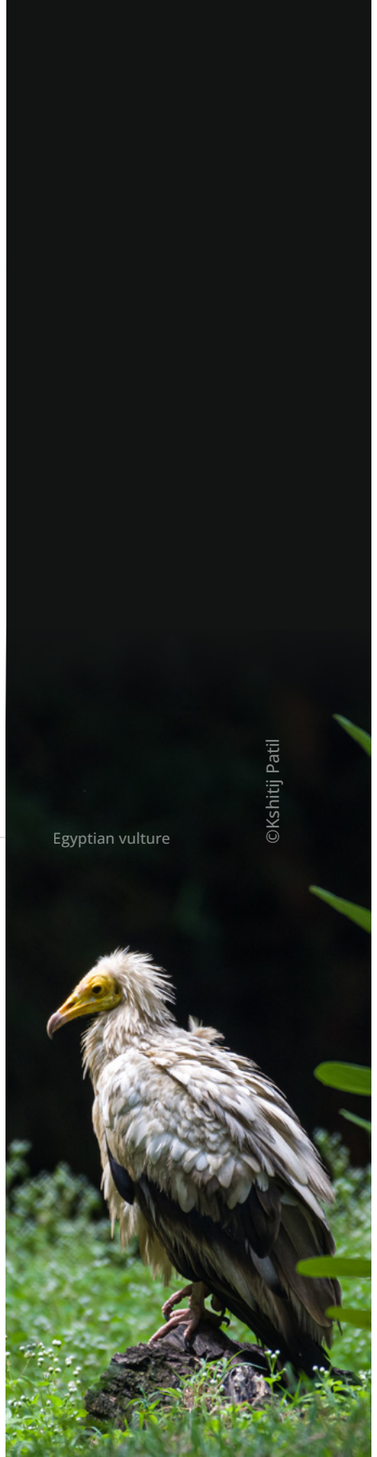



**Figure 3:** eBird checklists received from citizen birders from different parts of the country **from 2023**




Egyptian vulture



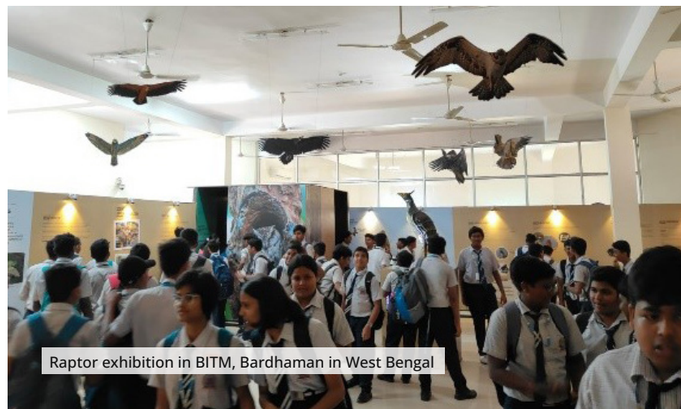
## Activities conducted during Year 3

i. A Communication Plan was developed for the Raptor Conservation Programme to strengthen outreach, education, and awareness for India's 107 raptor species at risk. The plan identifies awareness gaps and challenges, proposing targeted actions like workshops, media campaigns, citizen science, and engagement with government agencies, Forest Department officials, communities, and youth. It includes strategies to mobilise support, build positive perceptions, and influence policy, with a monitoring framework to measure results. Reviewed by WWF-India and state Forest Department offices, the plan ensures coordinated and effective implementation. The cover pages of all publications from the programme are appended in (**Annexure IX**).


Release of a poster "Corbett ke Jatayu Pakshi" by the Honourable Governor of Uttarakhand, Lt Gen Gurmit Singh, PVSM, UYSM, AVSM, VSM (retd), Shri Subodh Uniyal, Honourable Minister of Forests, Shri. Ganesh Joshi, Hon'ble Minister of Agriculture & Farmers' Welfare, and Shri R.K. Sudhanshu, IAS, Principal Secretary, Govt. Of Uttarakhand

ii. As part of our outcome-driven Communication Plan, the "Wings of Wonder" raptor exhibition was modified into a portable format and launched in Dehradun on 30th September 2024 to coincide with the Wildlife Week 2024 with a footfall of over 3000 people at Uttara Art Gallery and Unison World School. This redesigned version could be dismantled easily and transported to remote locations across Uttarakhand, extending our outreach beyond major cities. An exhibition was also launched in BITM, Bardhaman in West Bengal. Acknowledging the increasing demand for the raptor exhibition and the need to take it to remote locations for wider outreach, a portable version was developed.
The content of the new versions of the raptor exhibition was customised to cover the raptor species and challenges relevant to respective landscapes. These exhibitions were launched at Kota, Jaipur, Vishakhapatnam, Bengaluru, and Valmiki Tiger Reserve in partnership with the WWF-India's state and landscape offices, as well as an inter-organisational collaboration with Azim Premji University.


Presenting the raptor exhibition to the Honourable Governor of Uttarakhand, Lt Gen Gurmit Singh, PVSM, UYSM, AVSM, VSM (retd), Shri Subodh Uniyal, Honourable Minister of Forests, and Dr Dhananjai Mohan, IFS, Ex-Hoff



Raptor exhibition in BITM, Bardhaman in West Bengal

iii. A series of training programmes were conducted for forest frontline staff in Uttarakhand, Rajasthan, Assam, and Bihar.

- Uttarakhand: 52 staff oriented at Corbett Tiger Reserve's Kalagarh Training Centre on raptor identification and monitoring.
- Rajasthan: 80 nature guides trained at Keoladeo National Park, focusing on habitat features and feeding ecology.
- Bihar: 35 staff trained at Valmiki Tiger Reserve in an orientation and knowledge-assessment workshop.
- Assam: 38 staff from eight forest divisions participated in a two-day orientation at the State Forest School, Jalukbari.

These workshops covered raptor identification, ecological roles, key threats, and integrating monitoring into routine patrolling duties. A draft of the Raptor Toolkit was also introduced during the Assam workshop.

Orientation session for forest department staff in Bihar

Training session for forest department staff in Assam

iv. As part of its efforts to foster conservation awareness through creative engagement, the programme supported the development of an innovative communication project in close collaboration with Forest Department officials and frontline staff who helped amplify outreach across key landscapes. The Wonder Bone is an illustrated anthology of poems on the decline of vultures in India, written and designed by Aditi Puttige, a student of Srishti Manipal Institute, during her internship with the RCP (**Annexure IX**). The Wonder Bone, a collection of poems, explores the personal and collective affliction of losing nature—especially vultures—by weaving memory, loss, and rediscovery into a heartfelt narrative that rekindles our connection with the natural world. It combines ecological information with creative expression to raise awareness about vulture conservation, complementing the awareness efforts undertaken jointly with the State Forest Departments and their frontline staff.

v. Citizen engagement is important for raptor conservation as it builds awareness and sensitivity to the challenges faced by raptors. As an initiative for citizen engagement, the fourth Annual Vulture Count was conducted for a month starting from the International Vulture Awareness Day 2024 (**Figure 4**). The findings of the Annual Vulture Count were consolidated in October 2024 and subsequently, an infographic was developed for information sharing. A total of 209 volunteers from 17 states participated in this exercise, reporting a total of 4,445 sightings of different vulture species.

©Guruprasad

Egyptian vulture photographed by one of our volunteers in Bengaluru

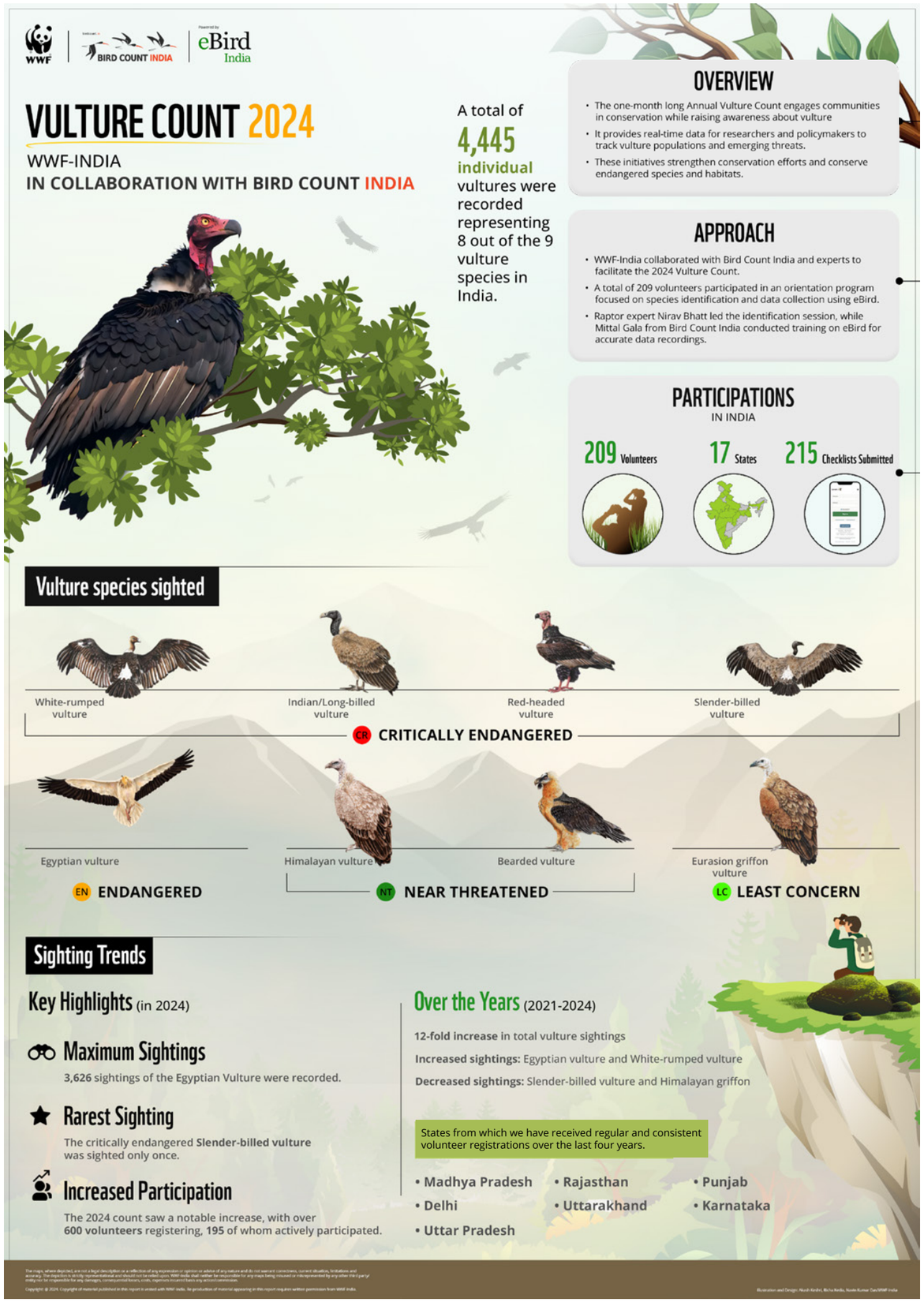



**Figure 4:** Snapshot of findings of Annual Vulture Count 2024

vi. Bird festivals serve as valuable platforms to engage students, researchers, bird experts, conservationists, Forest Department officials, and other stakeholders on raptor conservation. The RCP team provided technical and resource support for bird festivals held in Kota, Jaipur, Udaipur, and Goa, among others, in close collaboration with the respective State Forest Departments. These interactions facilitated knowledge sharing on raptor distribution, conservation challenges, and strategic actions needed for their protection, while further strengthening WWF-India's partnership with Forest Departments across landscapes.

Expert panellist at the Bird Festival in Jaipur

Session on raptors of Goa during the Goa Bird Festival

The RCP team with the Rajasthan Forest Department staff at the Kota bird festival


Interaction with visitors at the Jaipur Bird Festival



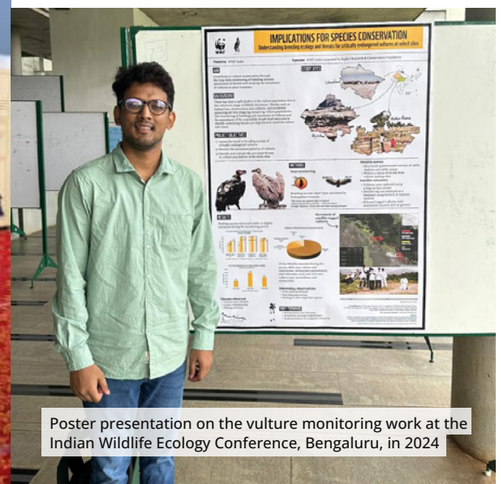
vii. A "Volleyball for Vultures" event, supported by the RCP team and conducted in collaboration with the Forest Department, was organised in Kallamapalayam Village, an Irula tribal settlement nestled in the Thengumarahada Range of the Masinagudi Division within the Mudumalai Tiger Reserve (MTR) landscape on 17th and 18th May 2025. Strategically located along the Moyar River, at the intersection of Sathyamangalam and Mudumalai Tiger Reserves, the village offers a unique setting for conservation-oriented community outreach due to its proximity to critical vulture habitats regularly monitored by frontline forest staff.


Volleyball tournament for vulture conservation held in Kallampalayam village, Tamil Nadu.


Vulture awareness session with local children during the tournament

The initiative was designed as a community-driven awareness and engagement event, jointly facilitated with local Forest Department officials, to foster greater understanding, ownership, and support for vulture conservation among the local population. The event blended sports and environmental education, providing a platform to initiate dialogue on vulture protection with both community members and forest personnel. Following the event, the community—encouraged by the Forest Department and WWF-India—agreed to form a local group to organise awareness events, monitor vulture sightings, and report threats, thereby strengthening long-term collaboration between communities and the Forest Department for vulture conservation.

viii. The WWF-India team presented the ongoing work on raptor conservation at key forums, including the Indian Wildlife Ecology Conference 2024, Bird Monitoring Symposium 2024, and National Symposium on Vulture Conservation 2024 (**Annexure X**). At these events, lessons learnt through activities conducted with the support and collaboration of State Forest Departments were shared, along with insights gathered on raptor monitoring and conservation. These platforms also helped strengthen relationships with Forest Department officials, facilitating discussions on expanding joint initiatives. A pathway for potential partnerships was paved forward, and the next step is to institutionalise these collaborations with individuals, organisations, and Forest Departments dedicated to raptor conservation to build a robust network for disseminating scientific knowledge.



Poster presentation on the vulture monitoring work at the Indian Wildlife Ecology Conference, Bengaluru, in 2024

Presenting the findings of three annual vulture counts at the national symposium for vulture conservation at Ahmedabad in 2024

# D. WAY FORWARD & PLAN FOR THE SECOND PHASE

In the second phase, the Raptor Conservation Programme aims to establish Raptor-Safe Landscapes, defined as places where raptors thrive through safe habitats, secure food sources, and coexistence with people. The strategy focuses on two pillars. First, ensuring safe habitats in close collaboration with State Forest Departments and frontline forest staff by protecting key roosting and nesting sites across forests, cliffs, grasslands, wetlands, and human-dominated areas, while integrating raptor-sensitive measures into urban and peri-urban planning. This will be guided by research on habitat use, movement patterns, and conflict zones to prioritise high-impact interventions in partnership with Forest Department field teams. Second, securing safe food sources, especially for vultures, by eliminating toxic NSAIDs, ensuring access to uncontaminated carcasses, and improving carcass management through partnerships with veterinary, livestock, and waste management authorities, alongside continued coordination with Forest Departments for site-level implementation. Promotion of raptor-friendly farming will further strengthen food security across landscapes. These actions, supported by strong collaboration with Forest Departments and frontline staff, chart a clear path for building resilient, raptor-safe landscapes and long-term conservation impact.

Little owl

©Clement Francis



## 1. Research and Monitoring

- Consolidation of the learnings from the previous phase of the project, aiming to address gaps in existing knowledge on raptor populations, distribution, habitats, threats, behaviour, and ecology, in close collaboration with State Forest Departments and their frontline forest staff.
- Adoption of a more integrated and policy-aligned approach, focusing on the generation of science-based data through long-term research and monitoring undertaken jointly with Forest Departments across participating states.

## 2. Threat Reduction and Disease Surveillance

- Development and implementation of strategies for the mitigation of direct threats to raptors and their habitats, in partnership with Forest Departments, frontline forest staff, and relevant state agencies.
- Providing greater emphasis on conservation actions in urban and peri-urban areas through collaboration with local urban authorities and State Forest Departments to include raptor-sensitive measures in city development plans and district environmental plans.
- Integration of raptor-friendly farming practices, including the use of vulture-safe non-steroidal anti-inflammatory drugs (NSAIDs) for livestock treatment and regulating the use of rodenticides, pesticides, and insecticides in fringe areas, in coordination with Forest Departments, agriculture and veterinary departments, in management and development plans.

## 3. Community Stewardship and Local Governance

- Strengthening of institutional capacities within Forest Departments and community governance systems, through meaningful engagement with local stakeholders, fostering cross-sectoral collaboration, advancing the One Health approach, and expanding public support for raptor conservation.
- Promotion of community-based monitoring and stewardship programmes with the support and participation of frontline forest staff.

## 4. Stakeholder Capacity, Policy Integration, and Public Awareness:

- Adoption of a robust strategy for enhancing awareness and understanding among stakeholders—including Forest Department officials, frontline staff, and conservation partners—to foster broader public support for raptor conservation.
- Develop tailored training modules, course materials, and state-specific standard operating procedures (SOPs) and best-practice guidelines for use by Forest Departments and their field teams.
- Integrate raptor conservation into broader policy frameworks, including State Biodiversity Action Plans, Forest Working Plans, and District Environmental Plans, in consultation with Forest Departments.

## 5. Communication

- Strengthen communication modalities to effectively communicate findings from various studies and surveys to a broader audience, including State Forest Departments, government bodies, and civil society.

## 6. Geographical expansion

- Plan for geographical expansion across states such as Kerala, Tamil Nadu, Odisha, West Bengal, Uttar Pradesh, and Bihar, which are both ecologically significant and currently underrepresented in raptor-focused conservation efforts, in partnership with the respective State Forest Departments and their frontline forest staff.

# ANNEXURE I

**Table 1:** Vulture nest monitoring in selected sites of Rajasthan and Madhya Pradesh 2021-2024

| No. | Site Name | Species | Breeding Success 2021-22 | Breeding Success 2022-23 | Breeding Success 2023-24 |
|---|---|---|---|---|---|
| 1 | Nilgay Tiraha, Bandhavgarh TR 1 | Indian vulture | - | - | 100% |
| 2 | Bathan Grassland, Bandhavgarh TR 2 | Indian vulture | - | - | 100% |
| 3 | Gidhaila, Satna FD | Indian vulture | - | - | 100% |
| 4 | Giddhgadh, Bhopal FD | Indian vulture | - | - | 67% |
| 5 | Ambamai, Satpura TR | Indian vulture | 50% | 63% | 75% |
| 6 | Chiklod, Obaidullaganj FD | White-rumped vulture | 76% | 80% | 74% |
| 7 | Geedhkanch, Nauradehi WLS | Indian vulture | 90% | 90% | 90% |
| 8 | Tindhni, Nauradehi WLS | White-rumped vulture | - | 92% | 90% |
| 9 | Tamia, Chhindwara FD | Indian vulture | 57% | 89% | 89% |
| 10 | Neemuch FD | White-rumped vulture | - | 86% | 80% |
| 11 | Bhordha, Kuno NP | Indian vulture | - | 57% | 65% |
| 12 | Gandhisagar WLS | Indian vulture | - | 70% | 60% |
| 13 | Bayana | Indian vulture | 86% | 100% | 92% |
| 14 | Gajjipur | Indian vulture | - | - | 100% |
| 15 | Etmaidpur | Indian vulture | - | - | 100% |
| 16 | Kapali waterfall | Indian vulture | - | - | 100% |
| 17 | Giridhanva Waterfall | Indian vulture | - | - | 100% |
| 18 | Damoh Waterfall | Indian vulture | - | - | 80% |
| 19 | Kala Khet, Bhainsrorgarh WLS | White-rumped vulture | - | - | 100% |
| 20 | Doodh Talai, Bhainsrorgarh WLS | Indian vulture | - | - | 83% |
| 21 | Behru Ji Ka Mal, Bhainsrorgarh WLS | Indian vulture | - | - | 100% |
| 22 | Sakal Kho, Bhainsrorgarh WLS | Indian vulture | - | - | 80% |
| 23 | Garadia Mahadev | Indian vulture | - | - | 100% |
| 24 | Gapernath | Indian vulture | - | - | 88% |
| 25 | Sal bani, Dhela Range, Corbett Tiger Reserve | White-rumped vulture | - | - | 60% |



**Table 2:** Nest monitoring in Madhya Pradesh 2024

| No. | Site Name | Species | Total nests | Active nests | Productive nests | Nesting Success |
|---|---|---|---|---|---|---|
| 1 | Nilgay Tiraha, Bandhavgarh TR 1 | Indian vulture | 42 | 23 | 23 | 100% |
| 2 | Bathan Grassland, Bandhavgarh TR 2 | Indian vulture | 17 | 7 | 7 | 100% |
| 3 | Gidhaila, Satna FD | Indian vulture | 23 | 11 | 11 | 100% |
| 4 | Giddhgadh, Bhopal FD | Indian vulture | 6 | 6 | 4 | 67% |
| 5 | Ambamai, Satpura TR | Indian vulture | 8 | 8 | 6 | 75% |
| 6 | Chiklod, Obaidullaganj FD | White-rumped vulture | 25 | 23 | 17 | 74% |
| 7 | Geedhkanch, Nauradehi WLS | Indian vulture | 20 | 20 | 18 | 90% |
| 8 | Tindhni, Nauradehi WLS | White-rumped vulture | 39 | 39 | 35 | 90% |
| 9 | Tamia, Chhindwara FD | Indian vulture | 9 | 9 | 8 | 89% |
| 10 | Neemuch FD | White-rumped vulture | 20 | 20 | 16 | 80% |
| 11 | Bhordha, Kuno NP | Indian vulture | 21 | 20 | 13 | 65% |
| 12 | Gandhisagar WLS | Indian vulture | 20 | 15 | 9 | 60% |
| 13 | Indian vulture | | 166 | 119 | 99 | |
| 14 | White-rumped vulture | | 84 | 82 | 68 | |
| | Total | | 250 | 201 | 167 | |

**Table 3:** Nest monitoring in Rajasthan 2024

| No. | Site Name | Species | Total nests | Active nests | Productive nests | Nesting Success |
|---|---|---|---|---|---|---|
| 1 | Bayana | Indian vulture | 25 | 13 | 12 | 92% |
| 2 | Gajjipur | Indian vulture | 2 | 1 | 1 | 100% |
| 3 | Etmaidpur | Indian vulture | 2 | 2 | 2 | 100% |
| 4 | Kapali waterfall | Indian vulture | 4 | 3 | 3 | 100% |
| 5 | Giridhanva Waterfall | Indian vulture | 4 | 3 | 3 | 100% |
| 6 | Damoh Waterfall | Indian vulture | 10 | 5 | 4 | 80% |
| 7 | Kala Khet, Bhainsrorgarh WLS | White-rumped vulture | 15 | 9 | 9 | 100% |
| 8 | Doodh Talai, Bhainsrorgarh WLS | Indian vulture | 12 | 6 | 5 | 83% |
| 9 | Behru Ji Ka Mal, Bhainsrorgarh WLS | Indian vulture | 3 | 3 | 3 | 100% |
| 10 | Sakal Kho, Bhainsrorgarh WLS | Indian vulture | 12 | 5 | 4 | 80% |
| 11 | Garadia Mahadev | Indian vulture | 9 | 9 | 9 | 100% |
| 12 | Gapernath | Indian vulture | 26 | 17 | 15 | 88% |
| 13 | Indian vulture | | 109 | 67 | 61 | |
| 14 | White-rumped vulture | | 15 | 9 | 9 | |
| | Total | | 124 | 76 | 70 | |


Government of Rajasthan
Forest Department

KEOLADEO NATIONAL PARK

# SUMMER COUNT OF OWLS IN KEOLADEO NATIONAL PARK, BHARATPUR

## ANNEXURE II

## BACKGROUND

Keoladeo National Park is known for its rich biodiversity and critical role as a stopover for migratory birds. Raptors, including owls, being key indicators of ecosystem health, play a vital role in maintaining ecological balance. Seasonal surveys, such as this summer owl survey, are conducted to establish a baseline of raptor species richness and abundance, which is vital for developing effective conservation strategies. The data collected will guide the creation of standardised protocols for raptor identification and monitoring, aiding in the park's long-term conservation efforts.

**68** individuals

LC

**Indian scops-owl**
*Otus bakkamoena* (Pennant, 1769)

**57** individuals

LC

**Spotted owlet**
*Athene brama* (Temminck, 1821)

**19** individuals

LC

**Dusky eagle owl**
*Bubo coromandus* (latham, 1790)

**2** individuals

LC

**Barn owl**
*Tyto alba* (Scopoli, 1769)


## APPROACH

**Morning and evening surveys**
- 4:30 AM to 6:00 AM
- 7:00 PM to 10:00 PM

**Call playback method**

**Species identification**
using bird identification guide and eBird & Merlin Bird ID

**Habitat Analysis**
using GIS mapping

**Protection regime of Keoladeo National Park**
- Wild Life (Protection) Act, 1972
- UNESCO World Heritage Site
- Important Bird Areas
- Ramsar Site

## HABITAT

Biogeographic Zone: Semi-Arid
Type: Wetland and Woodland

37.35% Woodland/Forests
32.16% Grassland
29.07% Wetland
1.42% Trails/Roads/Tourism Zones

**Dominant trees**
*Mitragyna parviflora* - *Kadam* or Burmese *Kadam*
*Syzygium cumini* - Java Plum or *Jamun*
*Acacia nilotica* - *Babul* or Egyptian Thorn
*Azadirachta indica* - *Neem* or Indian Lilac

## SURVEY INSIGHTS

**Sighted during Morning**
26

**Evening**
64

**Activities**
86 perched
3 In-flight
1 Feeding

**Maximum number of individuals recorded in:**
E, L1, D blocks

**Minimum number of individuals recorded in:**
G3, G1, F4 blocks



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**Photo Credits:** Nilutpal Mahanta, Binoy Bikash Gogoi, Diganta Gogoi, Pratik Desai
In collaboration with Keoladeo National Park, Rajashtan Forest Department, Raptor Research and Conservation Foundation, Raptor Conservation Programme/WWF-India

**References:**
https://environment.rajasthan.gov.in/content/dam/environment/Env/ZMP/ZMP_KNP.pdf
Barn owl (*Tyto alba*) | Natural History Museum (nhm.ac.uk)
Common Barn-owl (*Tyto alba*) - BirdLife species factsheet
Indian Scops Owl – Thiruvananthapuram Natural History Museum (tnhm.in)
https://whc.unesco.org/en/list/340/
Estimating Numbers of Terrestrial Birds (unm.edu)

# ANNEXURE III

Checklist of raptor species recorded during the **survey in Rajasthan (Nov-Dec 2024)**

| Sl. No. | Raptor Species | Scientific Name | IUCN Status* | SoIB Trend** |
|---|---|---|---|---|
| **Order: Accipitriformes I Family: Accipitridae** | | | | |
| 1 | Steppe eagle | *Aquila nipalensis* | EN | S |
| 2 | Greater spotted eagle | *Clanga clanga* | VU | S |
| 3 | Egyptian vulture | *Neophron percnopterus* | EN | D |
| 4 | Pallid harrier | *Circus macrourus* | NT | D |
| 5 | Western marsh harrier | *Circus aeruginosus* | LC | D |
| 6 | Shikra | *Accipiter badius* | LC | S |
| 7 | Short-toed snake eagle | *Circaetus gallicus* | LC | RD |
| 8 | Black-winged kite | *Elanus caeruleus* | LC | D |
| 9 | Oriental honey buzzard | *Pernis ptilorhynchus* | LC | S |
| 10 | Eurasian griffon | *Gyps fulvus* | LC | D |
| 11 | Himalayan vulture | *Gyps himalayensis* | NT | TI |
| 12 | Indian vulture | *Gyps indicus* | CR | RD |
| 13 | White-rumped vulture | *Gyps bengalensis* | CR | RD |
| 14 | White-eyed buzzard | *Butastur teesa* | LC | D |
| 15 | Black kite | *Milvus migrans* | LC | S |
| 16 | Eurasian sparrowhawk | *Accipiter nisus* | LC | S |
| 17 | Bonelli's eagle | *Aquila fasciata* | LC | S |
| 18 | Imperial eagle | *Aquila heliaca* | VU | TI |
| 19 | Booted eagle | *Hieraaetus pennatus* | LC | TI |
| 20 | Crested serpent eagle | *Spilornis cheela* | LC | TI |
| 21 | Cinereous vulture | *Aegypius monachus* | NT | TI |
| 22 | Long-legged buzzard | *Buteo rufinus* | LC | TI |
| 23 | Tawny eagle | *Aquila rapax* | VU | RD |
| 24 | Common buzzard | *Buteo buteo* | LC | S |
| 25 | Himalayan buzzard | *Buteo refectus* | LC | D |
| 26 | Red-headed vulture | *Sarcogyps calvus* | CR | RD |
| 27 | Montagu's harrier | *Circus pygargus* | LC | D |
| 28 | Besra | *Accipiter virgatus* | LC | ID |
| **Order: Falconiformes I Family: Falconidae** | | | | |
| 29 | Common kestrel | *Falco tinnunculus* | LC | RD |
| 30 | Laggar falcon | *Falco jugger* | NT | RD |
| 31 | Eurasian hobby | *Falco subbuteo* | LC | ID |
| 32 | Red-necked falcon | *Falco chicquera* | LC | D |
| 33 | Peregrine falcon | *Falco peregrinus* | LC | S |
| **Order: Strigiformes I Family: Tytonidae** | | | | |
| 34 | Barn owl | *Tyto alba* | LC | NK |
| **Order: Strigiformes I Family: Strigidae** | | | | |
| 35 | Indian eagle-owl | *Bubo bengalensis* | LC | NK |
| 36 | Spotted owlet | *Athene brama* | LC | NK |
| 37 | Indian scops owl | *Otus bakkamoena* | LC | NK |
| 38 | Dusky eagle-owl | *Bubo coromandus* | LC | ID |
| 39 | Short-eared owl | *Asio flammeus* | LC | TI |
| 40 | Osprey | *Pandion haliaetus* | LC | RD |

*Abbreviations: Cr: Critically Endangered, EN: Endangered, NT: Near Threatened, Vu: Vulnerable, LC: Least Concern;
**S: Stable, ID: Insufficient Data, NK: Not Known, I: Increase, RD: Rapid Decline, D: Decline, TI: Trend inconclusive



Checklist of raptor species recorded during the survey in **Rajasthan (Feb-Mar 2025)**

| Sl. No. | Raptor Species | Scientific Name | IUCN Status* | SoIB Trend** |
|---|---|---|---|---|
| **Order: Accipitriformes I Family: Accipitridae** | | | | |
| 1 | Black kite | *Milvus migrans* | LC | S |
| 2 | Black-winged kite | *Elanus caeruleus* | LC | D |
| 3 | Bonelli's eagle | *Aquila fasciata* | LC | S |
| 4 | Booted eagle | *Hieraaetus pennatus* | LC | TI |
| 5 | Changeable hawk-eagle | *Nisaetus cirrhatus* | LC | S |
| 6 | Cinereous vulture | *Aegypius monachus* | NT | TI |
| 7 | Crested serpent-eagle | *Spilornis cheela* | LC | TI |
| 8 | Egyptian vulture | *Neophron percnopterus* | EN | D |
| 9 | Eurasian griffon | *Gyps fulvus* | LC | D |
| 10 | Western marsh harrier | *Circus aeruginosus* | LC | D |
| 11 | Eurasian sparrowhawk | *Accipiter nisus* | LC | S |
| 12 | Greater spotted eagle | *Clanga clanga* | VU | S |
| 13 | Himalayan vulture | *Gyps himalayensis* | NT | TI |
| 14 | Eastern imperial eagle | *Aquila heliaca* | VU | TI |
| 15 | Indian spotted eagle | *Clanga hastata* | VU | TI |
| 16 | Indian vulture | *Gyps indicus* | CR | RD |
| 17 | Long-legged buzzard | *Buteo rufinus* | LC | TI |
| 18 | Montagu's harrier | *Circus pygargus* | LC | D |
| 19 | Oriental honey buzzard | *Pernis ptilorhynchus* | LC | S |
| 20 | Pallid harrier | *Circus macrourus* | NT | D |
| 21 | Red-headed vulture | *Sarcogyps calvus* | CR | RD |
| 22 | White-rumped vulture | *Gyps bengalensis* | CR | RD |
| 23 | Shikra | *Accipiter badius* | LC | S |
| 24 | Short-toed snake eagle | *Circaetus gallicus* | LC | RD |
| 25 | Steppe eagle | *Aquila nipalensis* | EN | S |
| 26 | Tawny eagle | *Aquila rapax* | VU | RD |
| 27 | White-eyed buzzard | *Butastur teesa* | LC | D |
| **Order: Accipitriformes l Family: Pandionidae** | | | | |
| 28 | Osprey | *Pandion haliaetus* | LC | RD |
| **Order: Falconiformes I Family: Falconidae** | | | | |
| 29 | Common kestrel | *Falco tinnunculus* | LC | RD |
| 30 | Laggar falcon | *Falco jugger* | NT | RD |
| 31 | Peregrine falcon | *Falco peregrinus* | LC | S |
| **Order: Strigiformes I Family: Strigidae** | | | | |
| 32 | Brown fish owl | *Ketupa zeylonensis* | LC | D |
| 33 | Dusky eagle-owl | *Bubo coromandus* | LC | ID |
| 34 | Indian scops owl | *Otus bakkamoena* | LC | NK |
| 35 | Jungle owlet | *Glaucidium radiatum* | LC | I |
| 36 | Mottled wood owl | *Strix ocellata* | LC | D |
| 37 | Oriental scops owl | *Otus sunia* | LC | NK |
| 38 | Indian eagle owl | *Bubo bengalensis* | LC | NK |
| 39 | Spotted owlet | *Athene brama* | LC | NK |

*Abbreviations: Cr: Critically Endangered, EN: Endangered, NT: Near Threatened, Vu: Vulnerable, LC: Least Concern;
**S: Stable, ID: Insufficient Data, NK: Not Known, I: Increase, RD: Rapid Decline, D: Decline, TI: Trend inconclusive



# ANNEXURE IV

Checklist of raptor species recorded during the survey in **Uttarakhand (Apr-Jun 2025)**

| Sl. No. | Raptor Species | Scientific Name | IUCN Status* | SoIB Trend** |
|---|---|---|---|---|
| **Order: Accipitriformes I Family: Accipitridae** | | | | |
| 1 | Rufous-bellied eagle | *Lophotriorchis kienerii* | NT | S |
| 2 | Black kite | *Milvus migrans* | LC | S |
| 3 | Booted eagle | *Hieraaetus pennatus* | LC | TI |
| 4 | Black-winged kite | *Elanus caeruleus* | LC | D |
| 5 | Besra | *Tachyspiza virgata* | LC | ID |
| 6 | Mountain hawk-eagle | *Nisaetus nipalensis* | NT | S |
| 7 | Himalayan vulture | *Gyps himalayensis* | NT | TI |
| 8 | Bearded vulture | *Gypaetus barbatus* | NT | RD |
| 9 | Eurasian sparrowhawk | *Accipiter nisus* | LC | S |
| 10 | Eurasian griffon | *Gyps fulvus* | LC | D |
| 11 | Crested serpent-eagle | *Spilornis cheela* | LC | TI |
| 12 | Shikra | *Tachyspiza badia* | LC | S |
| 13 | Egyptian vulture | *Neophron percnopterus* | EN | D |
| 14 | Bonelli's eagle | *Aquila fasciata* | LC | S |
| 15 | Changeable hawk-eagle | *Nisaetus cirrhatus* | LC | S |
| 16 | Oriental honey buzzard | *Pernis ptilorhynchus* | LC | S |
| 17 | Pallas's fish eagle | *Haliaeetus leucoryphus* | EN | TI |
| 18 | Indian spotted eagle | *Clanga hastata* | VU | TI |
| 19 | Red-headed vulture | *Sarcogyps calvus* | CR | RD |
| 20 | Cinereous vulture | *Aegypius monachus* | NT | TI |
| 21 | Golden eagle | *Aquila chrysaetos* | LC | ID |
| 22 | White-rumped vulture | *Gyps bengalensis* | CR | RD |
| 23 | Black eagle | *Ictinaetus malaienesis* | LC | S |
| 24 | White-eyed buzzard | *Butastur teesa* | LC | D |
| 25 | Lesser fish eagle | *Ichthyophaga humilis* | NT | TI |
| 26 | Upland buzzard | *Buteo hemilasius* | LC | D |
| **Order: Falconiformes I Family: Falconidae** | | | | |
| 27 | Eurasian hobby | *Falco subbuteo* | LC | ID |
| 28 | Common kestrel | *Falco tinnunculus* | LC | RD |
| 29 | Peregrine falcon | *Falco peregrinus* | LC | S |
| 30 | Collared falconet | *Microhierax caerulescens* | LC | ID |
| **Order: Strigiformes I Family: Strigidae** | | | | |
| 31 | Collared owlet | *Taenioptynx brodiei* | LC | ID |
| 32 | Jungle owlet | *Glaucidium radiatum* | LC | I |
| 33 | Brown wood owl | *Strix leptogrammica* | LC | D |
| 34 | Brown fish owl | *Ketupa zeylonensis* | LC | D |
| 35 | Brown boobook | *Ninox scutulata* | LC | NK |
| 36 | Indian scops owl | *Otus bakkamoena* | LC | NK |
| 37 | Oriental scops owl | *Otus sunia* | LC | NK |
| 38 | Asian barred owlet | *Glaucidium cuculoides* | LC | S |
| 39 | Tawny fish owl | *Ketupa flavipes* | LC | NK |
| **Order: Accipitriformes I Family: Pandionidae** | | | | |
| 40 | Osprey | *Pandion haliaetus* | LC | RD |

*Abbreviations: Cr: Critically Endangered, EN: Endangered, NT: Near Threatened, Vu: Vulnerable, LC: Least Concern;
**S: Stable, ID: Insufficient Data, NK: Not Known, I: Increase, RD: Rapid Decline, D: Decline, TI: Trend inconclusive

Eurasian hobby

©Arpit Deomurari

# ANNEXURE V

Checklist of raptor species recorded during the survey in **Upper Assam (Dec 2024)**

| Sl. No. | Raptor Species | Scientific Name | IUCN Status* | SoIB Trend** |
|---|---|---|---|---|
| **Order: Accipitriformes I Family: Accipitridae** | | | | |
| 1 | Crested serpent eagle | *Spilornis cheela* | LC | TI |
| 2 | Indian spotted eagle | *Clanga hastata* | VU | TI |
| 3 | Himalayan buzzard | *Buteo refectus* | LC | D |
| 4 | Shikra | *Accipiter badius* | LC | S |
| 5 | Besra | *Accipiter virgatus* | LC | ID |
| 6 | Himalayan vulture | *Gyps himalayensis* | NT | TI |
| 7 | Black-winged kite | *Elanus caeruleus* | LC | D |
| 8 | Black kite | *Milvus migrans* | LC | S |
| 9 | Booted eagle | *Hieraaetus pennatus* | LC | TI |
| 10 | Black eagle | *Ictinaetus malaienesis* | LC | S |
| 11 | Short-toed snake eagle | *Circaetus gallicus* | LC | RD |
| 12 | Pallas's fish eagle | *Haliaeetus leucoryphus* | EN | TI |
| 13 | Hen harrier | *Circus cyaneus* | LC | D |
| 14 | Eastern imperial eagle | *Aquila heliaca* | VU | TI |
| 15 | Oriental honey buzzard | *Pernis ptilorhynchus* | LC | S |
| 16 | Jerdon's baza | *Aviceda jerdoni* | LC | ID |
| 17 | Western marsh harrier | *Circus aeruginosus* | LC | D |
| 18 | Pied harrier | *Circus melanoleucos* | LC | TI |
| 19 | Golden eagle | *Aquila chrysaetos* | LC | ID |
| 20 | Greater spotted eagle | *Clanga clanga* | VU | S |
| 21 | Steppe eagle | *Aquila nipalensis* | EN | S |
| 22 | Mountain hawk-eagle | *Nisaetus nipalensis* | LC | S |
| 23 | Changeable hawk-eagle | *Nisaetus cirrhatus* | LC | S |
| **Order: Accipitriformes I Family: Pandionidae** | | | | |
| 24 | Osprey | *Pandion haliaetus* | LC | RD |
| **Order: Falconiformes I Family: Falconidae** | | | | |
| 25 | Red-necked falcon | *Falco chicquera* | LC | D |
| 26 | Common kestrel | *Falco tinnunculus* | LC | RD |
| 27 | Oriental hobby | *Falco severus* | LC | ID |

*Abbreviations: Cr: Critically Endangered, EN: Endangered, NT: Near Threatened, Vu: Vulnerable, LC: Least Concern;
**S: Stable, ID: Insufficient Data, NK: Not Known, I: Increase, RD: Rapid Decline, D: Decline, TI: Trend inconclusive



# ANNEXURE VI

Checklist of raptor species recorded during the survey in **Coimbatore (Feb 2025)**

| Sl. No. | Common Name | Scientific Name | IUCN Status* | SoIB Trend** |
|---|---|---|---|---|
| **Order: Accipitriformes I Family: Accipitridae** | | | | |
| 1 | Black eagle | *Ictinaetus malayensis* | NT | S |
| 2 | Bonelli's eagle | *Aquila fasciata* | LC | S |
| 3 | Booted eagle | *Hieraaetus pennatus* | LC | S |
| 4 | Changeable hawk-eagle | *Nisaetus cirrhatus* | LC | S |
| 5 | Legge's hawk-eagle | *Nisaetus kelaarti* | NK | ID |
| 6 | Crested serpent-eagle | *Spilornis cheela* | LC | TI |
| 7 | Greater spotted-eagle | *Clanga clanga* | VU | S |
| 8 | Rufous-bellied eagle | *Lophotriorchis kienerii* | NT | TI |
| 9 | Short-toed snake-eagle | *Circaetus gallicus* | LC | RD |
| 10 | Black kite | *Milvus migrans* | LC | S |
| 11 | Black-winged kite | *Elanus caeruleus* | LC | D |
| 12 | Brahminy kite | *Haliastur indus* | LC | S |
| 13 | Oriental honey-buzzard | *Pernis ptilorhynchus* | LC | S |
| 14 | White-eyed buzzard | *Butastur teesa* | LC | TI |
| 15 | Shikra | *Tachyspiza badia* | LC | TI |
| **Order: Accipitriformes I Family: Pandionidae** | | | | |
| 16 | Osprey | *Pandion haliaetus* | LC | RD |
| **Order: Falconiformes I Family: Falconidae** | | | | |
| 17 | Eurasian kestrel (Common Kestrel) | *Falco tinnunculus* | LC | RD |
| **Order: Strigiformes I Family: Strigidae** | | | | |
| 18 | Brown fish-owl | *Ketupa zeylonensis* | LC | D |
| 19 | Spot-bellied eagle-owl | *Ketupa nipalensis* | LC | NK |
| 20 | Rock eagle-owl (Indian eagle-owl) | *Bubo bengalensis* | LC | NK |
| 21 | Indian scops-owl | *Otus bakkamoena* | LC | NK |
| 22 | Oriental scops-owl | *Otus sunia* | LC | NK |
| 23 | Brown hawk-owl | *Ninox scutulata* | LC | NK |
| 24 | Jungle owlet | *Glaucidium radiatum* | LC | I |
| 25 | Spotted owlet | *Athene brama* | LC | NK |

*Abbreviations: Cr: Critically Endangered, EN: Endangered, NT: Near Threatened, Vu: Vulnerable, LC: Least Concern;
**S: Stable, ID: Insufficient Data, NK: Not Known, I: Increase, RD: Rapid Decline, D: Decline, TI: Trend inconclusive

# ANNEXURE VII

Checklist of raptor species recorded during the survey in **Satpura Tiger Reserve (Mar 2024)**

| Sl. No. | Raptor Species | Scientific Name | IUCN Status* | SoIB Trend** |
|---|---|---|---|---|
| **Order: Accipitriformes I Family: Accipitridae** | | | | |
| 1 | Changeable hawk-eagle | *Nisaetus cirrhatus* | LC | S |
| 2 | Crested serpent eagle | *Spilornis cheela* | LC | TI |
| 3 | Grey-headed fish eagle | *Haliaeetus ichthyaetus* | NT | ID |
| 4 | Short-toed snake eagle | *Circaetus gallicus* | LC | RD |
| 5 | Bonelli's eagle | *Aquila fasciata* | LC | S |
| 6 | Black eagle | *Ictinaetus malayensis* | NT | S |
| 7 | White-eyed buzzard | *Butastur teesa* | LC | D |
| 8 | Oriental honey buzzard | *Pernis ptilorhynchus* | LC | S |
| 9 | Eurasian sparrowhawk | *Accipiter nisus* | LC | S |
| 10 | Shikra | *Accipiter badius* | LC | S |
| 11 | Indian vulture | *Gyps indicus* | CR | RD |
| 12 | Egyptian vulture | *Neophron percnopterus* | EN | D |
| 13 | Himalayan vulture | *Gyps himalayensis* | NT | TI |
| 14 | Red-headed vulture | *Sarcogypus calvus* | CR | RD |
| 15 | Black-winged kite | *Elanus caeruleus* | LC | D |
| **Order: Accipitriformes l Family: Pandionidae** | | | | |
| 16 | Osprey | *Pandion haliaetus* | LC | RD |
| **Order: Falconiformes I Family: Falconidae** | | | | |
| 17 | Peregrine falcon | *Falco peregrinus* | LC | S |
| 18 | Common kestrel | *Falco tinnunculus* | LC | RD |
| **Order: Strigiformes I Family: Strigidae** | | | | |
| 19 | Spotted owlet | *Athene brama* | LC | NK |
| 20 | Jungle owlet | *Glaucidium radiatum* | LC | I |
| 21 | Indian scops owl | *Otus bakkamoena* | LC | NK |
| 22 | Oriental scops owl | *Otus sunia* | LC | NK |
| 23 | Mottled wood owl | *Strix ocellata* | LC | D |
| 24 | Brown wood owl | *Strix leptogrammica* | LC | D |
| 25 | Spot-bellied eagle-owl | *Bubo nipalensis* | LC | NK |
| 26 | Indian eagle-owl | *Bubo bengalensis* | LC | NK |
| 27 | Brown fish owl | *Ketupa zeylonensis* | LC | D |
| 28 | Dusky eagle-owl | *Bubo coromandus* | LC | ID |
| 29 | Brown hawk-owl | *Ninox scutulata* | LC | NK |
| **Order: Strigiformes I Family: Tytonidae** | | | | |
| 30 | Barn owl | *Tyto alba* | LC | NK |

*Abbreviations: Cr: Critically Endangered, EN: Endangered, NT: Near Threatened, Vu: Vulnerable, LC: Least Concern;
**S: Stable, ID: Insufficient Data, NK: Not Known, I: Increase, RD: Rapid Decline, D: Decline, TI: Trend inconclusive



Checklist of raptor species recorded during the survey in **Satpura Tiger Reserve (Dec 2024)**

| Sl. No. | Raptor Species | Scientific Name | IUCN Status* | SoIB Trend** |
|---|---|---|---|---|
| **Order: Accipitriformes I Family: Accipitridae** | | | | |
| 1 | Red-headed vulture | *Sarcogypus calvus* | CR | RD |
| 2 | Indian vulture | *Gyps indicus* | CR | RD |
| 3 | Egyptian vulture | *Neophron percnopterus* | EN | D |
| 4 | Himalayan vulture | *Gyps himalayensis* | NT | TI |
| 5 | Grey-headed fish eagle | *Haliaeetus ichthyaetus* | NT | ID |
| 6 | Pallid harrier | *Circus macrourus* | NT | D |
| 7 | Western marsh harrier | *Circus aeruginosus* | LC | D |
| 8 | Black eagle | *Ictinaetus malaienesis* | LC | S |
| 9 | Bonelli's eagle | *Aquila fasciata* | LC | S |
| 10 | Booted eagle | *Hieraaetus pennatus* | LC | TI |
| 11 | Short-toed snake eagle | *Circaetus gallicus* | LC | RD |
| 12 | Changeable hawk-eagle | *Nisaetus cirrhatus* | LC | S |
| 13 | Crested serpent eagle | *Spilornis cheela* | LC | TI |
| 14 | Oriental honey buzzard | *Pernis ptilorhynchus* | LC | S |
| 15 | Shikra | *Accipiter badius* | LC | S |
| 16 | White-eyed buzzard | *Butastur teesa* | LC | D |
| 17 | Eurasian sparrowhawk | *Accipiter nisus* | LC | S |
| 18 | Black-winged kite | *Elanus caeruleus* | LC | D |
| **Order: Falconiformes I Family: Falconidae** | | | | |
| 19 | Peregrine falcon | *Falco peregrinus* | LC | S |
| 20 | Common kestrel | *Falco tinnunculus* | LC | RD |
| **Order: Strigiformes I Family: Tytonidae** | | | | |
| 21 | Barn owl | *Tyto alba* | LC | NK |
| **Order: Strigiformes I Family: Strigidae** | | | | |
| 22 | Brown fish-owl | *Ketupa zeylonensis* | LC | D |
| 23 | Spot-bellied eagle-owl | *Ketupa nipalensis* | LC | NK |
| 24 | Rock eagle-owl (Indian eagle-owl) | *Bubo bengalensis* | LC | NK |
| 25 | Indian scops-owl | *Otus bakkamoena* | LC | NK |
| 26 | Oriental scops-owl | *Otus sunia* | LC | NK |
| 27 | Brown hawk-owl | *Ninox scutulata* | LC | NK |
| **Order: Accipitriformes I Family: Accipitridae** | | | | |
| 28 | Brown boobook | *Ninox scutulata* | LC | NK |
| 29 | Brown fish owl | *Ketupa zeylonensis* | LC | D |
| 30 | Dusky eagle-owl | *Bubo coromandus* | LC | ID |
| 31 | Indian eagle-owl | *Bubo bengalensis* | LC | NK |
| 32 | Spot-bellied eagle-owl | *Bubo nipalensis* | LC | NK |
| **Order: Accipitriformes l Family: Pandionidae** | | | | |
| 33 | Osprey | *Pandion haliaetus* | LC | RD |

*Abbreviations: Cr: Critically Endangered, EN: Endangered, NT: Near Threatened, Vu: Vulnerable, LC: Least Concern;
**S: Stable, ID: Insufficient Data, NK: Not Known, I: Increase, RD: Rapid Decline, D: Decline, TI: Trend inconclusive

# ANNEXURE VIII

Government of Rajasthan
**Forest Department**

WWF | R·R·C·F

## SCAVENGERS AT RISK
### Interaction Between Plastic Waste and Birds of Prey

## CONTEXT

Free-ranging cattle often consume plastic from garbage dumps and roadsides, leading to premature deaths. Their plastic-contaminated carcasses are disposed of at dumps, where vultures and other scavengers feed, introducing plastic into their food chain. This infographic highlights the issue of plastic waste in Bikaner and surrounding areas and suggests measures to ensure plastic-free food sources for livestock and birds at Jodbeed Gadhwala Conservation Reserve.

## THE JOURNEY OF PLASTIC WASTE IN BIKANER

1 Plastic waste leaks from urban and rural areas[1]

2 Moves from one place to another with wind and water

3 Free-ranging livestock ingest plastic waste from streets, bins, and landfills

4 Plastic waste accumulate in cattle's digestive systems, causing blockages, malnutrition, and eventual death

5 Dead livestock are often dumped in open grounds, becoming potential food sources for vultures

## VULTURES AT JODBEED CONSERVATION RESERVE

Of the 9 species found in India, 7 - including migratory Cinereous vulture and resident Red-headed vulture - are recorded in Jodbeed

## PLASTIC WASTE IN VULTURE FOOD CHAIN

**Bikaner**
population
**8,35,802** (2024)[2]
**81** wards

**400 tonnes** of solid waste collected every day
**11,390 tonnes/month** of solid waste gets dumped at designated waste dumping sites[3] (July 2024)

**Total Livestock population 27,22,411**[4] (2019)
**Cow 11,94,729**
**Buffalo 2,08,251**
**Camel 27,357**
**Sheep 6,62,136**
**Goat 6,26,769**

**10** Cattle shelters in the city
**25** First class Veterinary Hospitals
**75** Veterinary Hospitals[5]


## Raptors at Jodbeed Conservation Reserve

**2940** Egyptian vulture
**565** Black kite
**11** Tawny eagle
**3** Eurasian kestrel
**2** White-eyed buzzard
**1** Short-toed snake eagle
**2** Montagu's harrier
**4** Laggar falcon
**5** Steppe eagle
**4** Greater spotted eagle

*The numbers are based on the survey of Jodbeed Conservation Reserve from 1st October to 7th October 2024

## INSIGHTS AND RECOMMENDATIONS FROM STAKEHOLDERS

**Local Community**
- Cattle often consume plastic near waste dumps
- This harms both, the cattle and their owners

**Animal Husbandry Department**
Annual incidences of health issues to livestock due to plastic waste ingestion are rapidly increasing

**Animal Skinners**
A significant amount of plastic waste is found in the stomach of dead cattle, signalling a disturbing trend

**Municipal Corporation**
- Improved waste management infrastructure
- Enhanced public awareness to control plastic waste disposal on roads

**Forest Department**
- The ecosystem services provided by avian scavengers must be safeguarded
- Effective waste management practices and enhanced public awareness are vital



*We're already dealing with NSAID-toxic food - please don't make it worse with plastic!*



Note: A first class veterinary hospital is a medical institution that provides high-quality care for animals, with well-trained and qualified staff, and a range of services. (https://dahd.nic.in)

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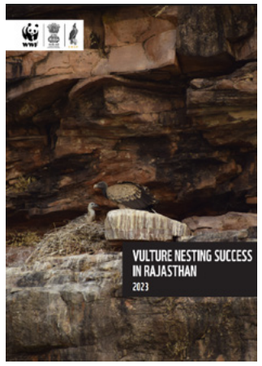
**Technical Guidance:** Ratul Saha, Dipankar Ghose
**Illustration and Design:** Navin Kumar Das/WWF-India
**Photo Credits:** Pratik Desai
In collaboration with Jodbeed Conservation Reserve, Rajashtan Forest Department, Raptor Research and Conservation Foundation, Raptor Conservation Programme/WWF-India

**Data sources:** [1]https://pubs.acs.org/doi/10.1021/acs.est.1c04781
[2]https://worldpopulationreview.com/
[3]Bikaner Municipal Corporation, Bikaner District Statistic 2021
[4][5]https://statistics.rajasthan.gov.in, Rajasthan University of Veterinary & Animal Sciences, Bikaner.

# ANNEXURE IX

## REPORTS




Vulture Nesting Success in Rajasthan 2023

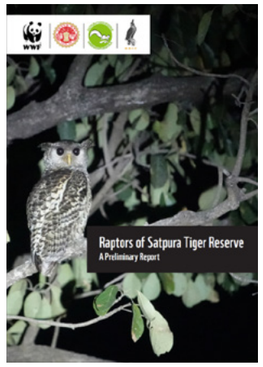

Training and Vulture Nest Monitoring in Madhya Pradesh


Monitoring Raptors: The Beginning (Hotspot Report)

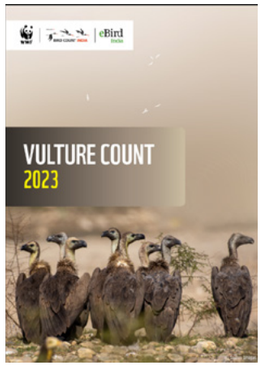

Vulture safe areas: Feasibility assessment


Workshop proceedings for Raptor safe areas in Kaziranga Landscape

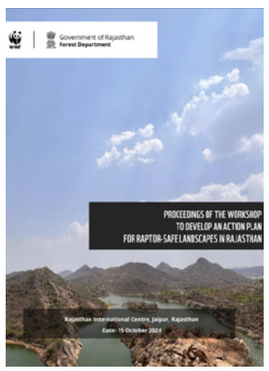

Communication plan for Raptor Conservation Programme




Raptors of Satpura Tiger Reserve

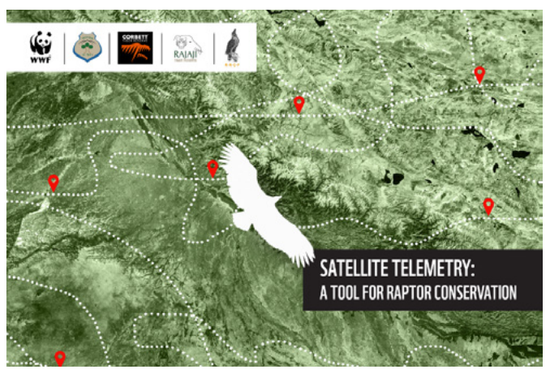



Vulture Count over a period of 3 years




Workshop proceedings for raptor safe landscape in Rajasthan


The Wonder Bone - An Anthology of Poems



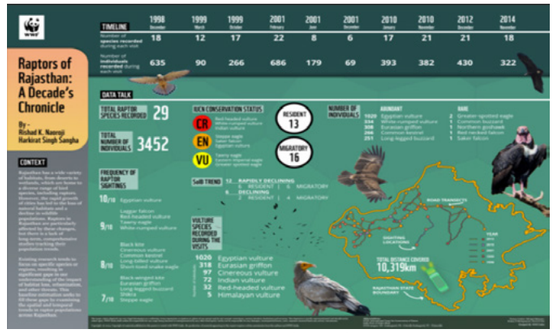

Satellite Telementry Report of Uttarakhand



## BROCHURE/POSTERS


Vultures of India

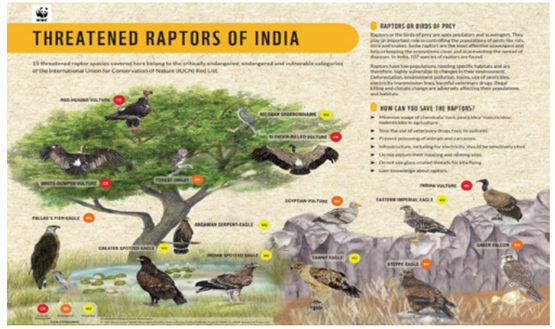

Threatened Raptors of India



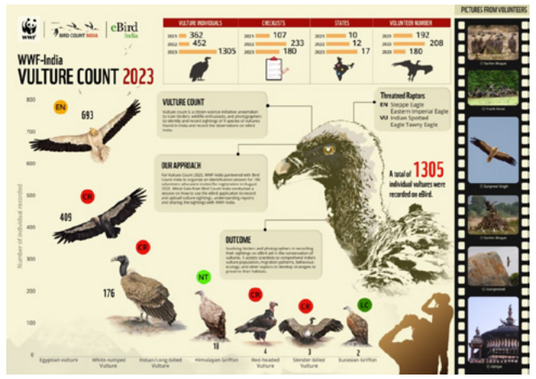

Raptors of Rajasthan: A Decade's Chronicle


Eagles of India

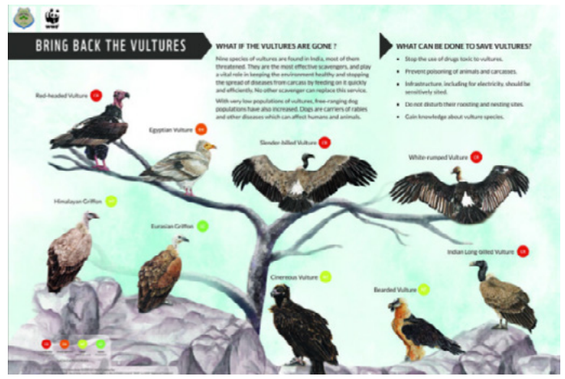

Owls of India




Threatened Raptors of India




Vulture Count 2023




Bring back the Vultures


Vultures of Corbett Tiger Reserve


Vultures of Rajasthan

# ANNEXURE X

### Participation in various conferences/symposia

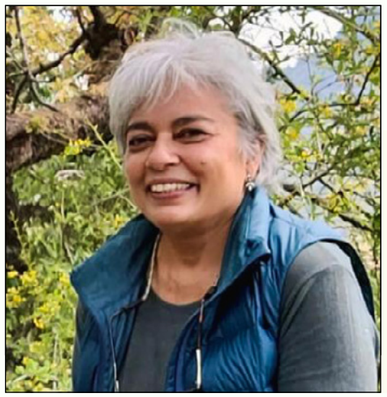
| Sr. No. | Topic of presentation | Presenter | Conference/Event | Venue | Date |
|---|---|---|---|---|---|
| 1 | Raptor conservation in Madhya Pradesh with special mention on vulture conservation | Ms Aishwarya Laghate | 1st Conference on Lesser-Known Species of Madhya Pradesh | Bhopal | 21-22 January 2023 |
| 2 | Role of local communities in vulture conservation | Ms Aishwarya Laghate | National Level Conference on Vulture Conservation and Reintroduction in Madhya Pradesh | Bhopal | March 2023 |
| 3 | Vulture nest monitoring & capacity building in Central Indian Landscape | Ms Aishwarya Laghate | Bird Monitoring Symposium, 2023 | Online | April 2023 |
| 4 | Raptor conservation (Endangered/ Lesser-Known) present status, Conservation | Mr Sunny Joshi | 2nd Conference on Lesser-Known Species of Madhya Pradesh | Bhopal | January 2024 |
| 5 | Implications for Species Conservation: Understanding breeding ecology and threats for critically endangered vultures at select sites | Mr Sunny Joshi | 1st Indian Wildlife Ecology Conference | Bangalore | 14-16 June 2024 |
| 6 | Long-term monitoring in Key Raptor Areas | Mr Sunny Joshi | Bird Monitoring in India symposium - 2024 | Online/ Bangalore | 09-10 August 2024 |
| 7 | Citizen Science in Monitoring Vultures: A potential tool for long-term studies? | Dr Rohan Shringarpure | National Symposium for Vulture Conservation | Ahmedabad | 29 September 2024 |
| 8 | Monitoring vultures through satellite telemetry for targeted conservation action at key habitats | Dr Rohan Shringarpure | Vulture Conservation Symposium Chhattisgarh 2024 | Online | 15 November 2024 |
| 9 | Talons on the Line: Impacts of powerlines on raptors and prevention strategies | Dr Rohan Shringarpure | WWF-India Nat-Infra dialogue on Minimizing the impacts of Powerlines on Avian species | Online | 23 December 2024 |
| 10 | Raptor Identification: Techniques and approaches with special emphasis on vultures | Mr Sunny Joshi | The Himalaya Collective: Nature Guide and Naturalist Series | Online | 19 April 2025 |
| 11 | Vulture conservation in India | Mr Sunny Joshi | Webinar on International Vulture Awareness Day – Uttarakhand Biodiversity Board | Online | 08 September 2025 |

# MEET OUR RCP TEAM

## ADVISORY TEAM

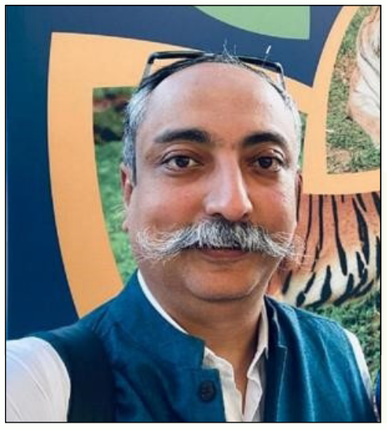
### Mr Ravi Singh
### Secretary General & CEO

**Mr Ravi Singh has steered his strong interest in India's nature conservation into leading the organisation since 2003. He is behind the Raptor Conservation Programme, having initiated its vision and connected the team with leading experts, conservationists, Forest Departments, and donors. He continues to advise the RCP on programme strategy, functioning, and external engagement. He has a keen interest in birds, especially raptors, and is an avid reader of Indian history, and natural history.**



### Dr Sejal Worah
### Programme Director

**Dr Worah provides strategic guidance, policy direction, and management oversight across all programmes in the organization. For the Raptor Conservation Programme, she advises on policy positioning, programme management, and integration with key government administrations and stakeholders, ensuring coherence and long-term relevance. Her broader portfolio focuses on species and habitat conservation, climate change adaptation and nature-based solutions, footprint reduction, climate and freshwater initiatives, sustainable resource use, and community-centered conservation across diverse landscapes.**



### Dr Dipankar Ghose
### Senior Director, Biodiversity Conservation

**Dr Ghose has been associated with WWF-India for nearly three decades, providing leadership and project management oversight to all biodiversity conservation programmes. An ornithologist and keen birder with a deep passion for raptors, he guides the RCP team on day-to-day implementation, scientific direction, and the development of strategic partnerships. His experience in field-based conservation and programme management helps ensure that the RCP remains grounded, rigorous, and well connected to national priorities.**

# PROGRAMME TEAM

## Ratul Saha, Director

**Specialisation: Natural Resource Management**

Ratul has led the Raptor Conservation Programme for over a year and a half, substantially strengthening the team's critical thinking, strategic planning, and high-level stakeholder engagement capacities. Drawing on more than two decades of multi-species and landscape-level conservation experience, he has shaped a clear, forward-looking vision for raptor conservation in India and continues to play a pivotal role in steering the programme's long-term strategy.

## Rinkita Gurav, Programme Manager

**Specialisation: Wildlife Conservation and Management**

Rinkita is a core member of the programme and has been an integral part of it since its inception in 2019. She brings strong policy and advocacy experience in vulture conservation in India, alongside evidence-based research and policy writing on Mumbai's environmental and development issues for a Member of Parliament. She adds immense value to strategising the policy and communications pillar of the programme, contributes to programme management and planning, and ensures that programme workstreams deliveries remain on schedule.

## Dr Rohan Shringarpure, Coordinator

**Specialisation- Biological Sciences**

Rohan has been part of RCP since 2023 and focuses on building the programme's scientific pillar. He contributes significantly to NSAID toxicology, bird handling and satellite telemetry, and brings a strong interest in all aspects of vulture ecology. He plays a key role in coordinating conservation efforts across priority landscapes to strengthen raptor protection on the ground.

## Sharath S Anchatageri, Associate Coordinator

**Specialisation: Wildlife Conservation Action**

Sharath joined the team in 2024 and is currently executing the programme's activities in the Western Ghats. He specialises in ornithology, community-based conservation, and human–wildlife conflict, and coordinates species and key-area projects for raptors while supporting the programme's scientific implementation. As the first intern with the WWF-India's Raptor Conservation Programme, he brings strong continuity of experience to the role. An avid birder and photographer, he is also adept at creating intuitive spatial maps.

## Navin Kumar Das, Senior Programme Officer

**Specialisation: Wildlife Ecology & Conservation Communication**

Navin has been part of the team since 2023, contributing from the early stages of the programme. He has a flair for creative design and brings strong aesthetic value to all programme publications. He is passionate about behaviour change and impactful conservation communication, and his engaging approach adds meaningful value to the training and capacity-building pillar of the programme.

## Sunny Joshi, Senior Programme Officer

**Specialisation: Avian Biology**

Sunny joined the programme in 2022 and has been closely involved in shaping conservation outcomes for raptors not only in Uttarakhand but across India. An avian biologist specialising in Himalayan birds, he has a strong interest in the movement ecology of raptors through satellite telemetry and in understanding habitat use. He has also been instrumental in forging key partnerships in Uttarakhand that support the programme's long-term vision.

## Pratik Desai, Programme Officer

**Specialisation: Wildlife Conservation Action**

Pratik joined the team in October 2024. He is a dedicated wildlife conservationist with strong expertise in raptors and is among the few who began his journey with an internship on raptors with WWF-India's Raptor Conservation Programme, continuing to build his career in this field. He has brought valuable research acumen and field knowledge that have significantly strengthened the programme's field activities.

## Pushkar Nandanwar, Programme Officer

**Specialisation: Forestry Management**

Pushkar is the newest addition to the team, having joined in 2025. With a specialisation in forestry management, he brings a strong management-oriented perspective to programme implementation in Rajasthan, drawing on a foundation in raptor conservation built during his internship with WWF-India's Raptor Conservation Programme. An avid birder, he has a strong understanding of habitat requirements and integrates practical management concepts into raptor conservation efforts.

# SPOT-BELLIED EAGLE-OWL

*Ketupa nipalensis*

**Global Status | IUCN: Least Concern (LC)**
**National Protection | WLPA: Schedule I**

## PHOTOGRAPHIC EVIDENCE OF SPOT-BELLIED EAGLE-OWL IN SATPURA TIGER RESERVE

### Limited confirmed sightings in Central India

The rare and elusive spot-bellied eagle-owl is inadequately studied owing to its solitary and territorial nature. There are very few photographic records of the bird from Central India, most of which are from Kanha and Pench Tiger Reserves. Although few researchers have reported the sighting of this owl species from Satpura Tiger Reserve, photographic evidence was not available to validate the claim.

### Importance of the photographic evidence for further studies

Owls of genus Ketupa have specific habitat requirements and trends in their population often indicate changes in habitat parameters such as water quality, prey availability, and vegetation composition. Therefore, studies on this group of owls would help the Forest Department make informed decisions for effective habitat management.

Our surveys in March and December 2024 provided photographic evidence of the species from two ranges of Satpura Tiger Reserve, thus confirming its presence. This presents an opportunity to collect systematic information on the distribution, breeding ecology, and population of this lesser-known species for future management interventions, if found necessary.

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