Sustainability and Biodiversity Conservation

Restoring the critically endangered Bengal Florican (*Houbaropsis bengalensis*) population in Koshi Tappu wildlife reserve and buffer Zone

Chhote Lal Chowdhary[1], Govinda Chaudhary[2*], Nand Lal Majhi[3]

[1]*Fund Raising and Program Development Director at Biodiversity Conservation Centre Nepal (BCCN)*
[2]*MPhil Scholar in STEAM Education, Kathmandu University School of Education*
[3]*Executive Director at Biodiversity Conservation Centre Nepal (BCCN)*
**Email: govinchaudhary@gmail.com*

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Abstract

The Bengal florican (*Houbaropsis bengalensis*) population in the Koshi Tappu Wildlife Reserve and its buffer zone has increased due to habitat conservation efforts. Population surveys, data analysis, and collaboration with local conservation groups have facilitated this recovery. Research indicates a link between Bengal florican distribution and habitat dynamics. This study uses data from censuses, monitoring, and local surveys to highlight the need for habitat conservation. Human activities threaten these habitats despite improvements, underscoring the importance of ongoing conservation measures.

Keywords: Bengal Florican, Habitat ecology conservation, Population dynamics, Anthropogenic factors

Introduction

The Bengal Florican (*Houbaropsis bengalensis*), first described by Gmelin in 1789, is among the world's rarest bustards and holds a Critically Endangered status on the IUCN Red List (IUCN 2023). This species is primarily found in the alluvial grasslands of the Terai region in southern Nepal and northern India, spanning along the Himalayan foothills and the Brahmaputra plain in northeastern India (Rahmani et al., 1991; Collar et al., 2001; Rahmani, 2012; Donald et al., 2013). The survival of the Bengal Florican is threatened by the loss and degradation of its grassland habitats, leading to the existence of only a few small, scattered populations in and around protected areas within the Terai. Unfortunately, there is a lack of conservation awareness among local

communities and key stakeholders, resulting in insufficient attention being given to safeguarding this endangered species. The Bengal Florican in Nepal is limited to specific locations within and near protected areas, with a population size estimated to be under 100 individuals (DNPWC, n.d. The species has been sighted in four lowland protected areas in Nepal: Suklaphanta National Park, Bardia National Park, Chitwan National Park, and the surrounding area of Koshi Tappu/Koshi barrage. Up-to-date information on the population size can be found in the latest data provided by relevant sources. Koshi Tappu Wildlife Reserve, among the Bengal Florican habitat in Nepal, comparatively holds a higher number. However, the population within the reserve is dwindling. A survey in 1982 recorded 4 individualsin Koshi Tappu Wildlife Reserve. But no sighting was made after 1986 (Inskipp & Inskipp, 1991). However, Bengal Florican made a comeback with an estimated as many as 12 pairs in 2011, and a comprehensive survey conducted in 2012 counted 47 birds (Baral et al., 2013). A survey by BCN (2014;2015) counted 35 individuals. The 2017 survey counted 41 individuals from the Koshi Tappu Wildlife Reserve and the surrounding area (Baral et al., 2020). BCN (2021) counted 21 Bengal Floricans. NTNC (2022) conducted a Bengal Florican survey with KTWR, the Koshi Bird Society, the Pokhara Bird Society, Himalayan Nature, and the Nepal Army. The survey area covered the grasslands inside the reserve and regions in the Sunsari, Saptari, and Udayapur districts; 21 individual Bengal Floricans were recorded (p. 20).

Material and methods

Habitat management in the Koshi Tappu Wildlife Reserve and its Buffer Zone area was significantly improved through a partnership with KTWR, NTNC, and Buffer Zone User Committees (BZUC). To foster eco-guardianship, nine Biodiversity Conservation Groups (BCGs) were established, involving 2,500 individuals from 504 households. Additionally, four Biodiversity Conservation Ambassadors were trained to enhance conservation education. A household survey and a questionnaire were conducted with 70 BZUC members. Efforts to limit unregulated grassland entry during the Bengal florican breeding season were implemented. A comprehensive Bengal Florican survey involved 16-30 surveyors covering 174 square kilometers, as outlined by Baral et al. (2013).

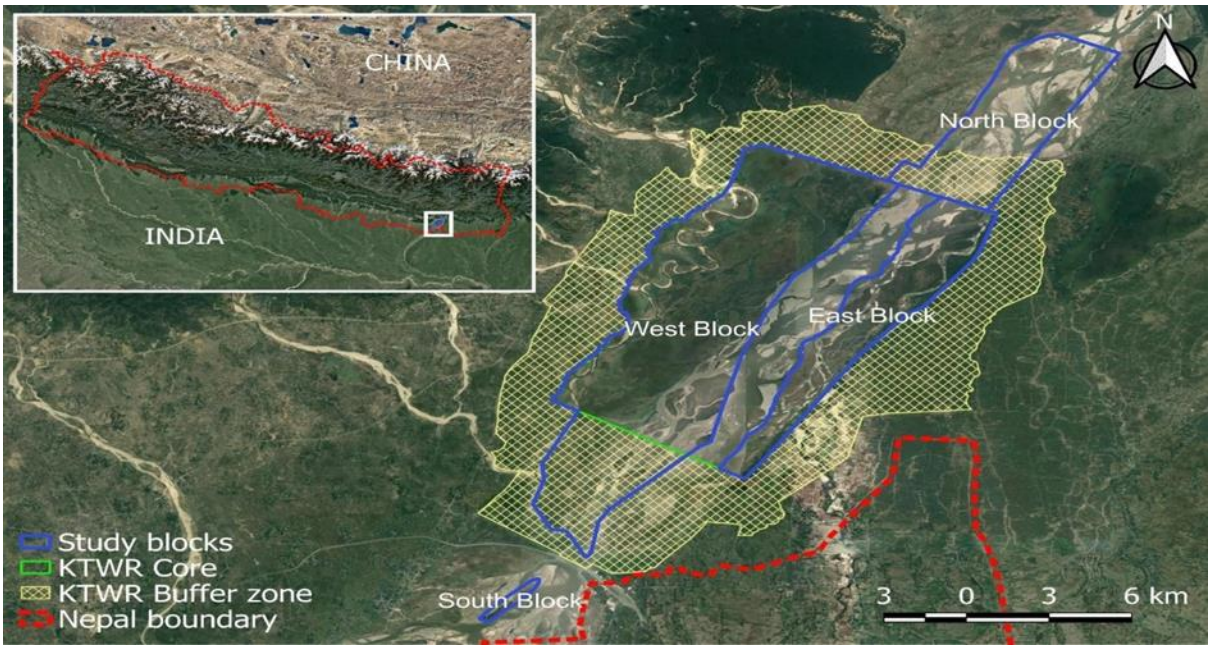

Figure 1. Study blocks set for Bengal florican population count in Koshi Tappu Wildlife Reserve

Table 1. Bengal Florican survey sites and blocks

Site	Block	Block area (Km^2)	Site area (Km^2)
Koshi Tappu Wildlife Reserve and its surrounding Area	North Block	32.00	174.00
	East Block	34.00	
	West Block	106.00	
	South Block	2.00	
Total Area			174.00

Results

Habitat Ecology

The habitat ecology of the Bengal florican is intricately connected with various factors affecting its conservation and management. This highly selective bustard species thrives in grasslands, preferring specific grass species like *Imperata cylindrica* and *Saccharum spontaneum*. The presence of scattered trees, optimal grass cover (60-80%), and a grass height of 2-3 feet is also crucial in creating a suitable habitat. Additionally, the species benefits from the proximity of water bodies, wild herbivores in the core zone, and domestic animals in the buffer areas.

Figure 2. Typical grassland habitat for Bengal florican dominated by Saccharum spontaneum

Crucial conservation efforts to preserve the Bengal florican population include maintaining grass height at 2-3 feet by cutting it in February and managing the habitat through controlled grazing. Balancing the presence of wild and domestic herbivores while promoting preferred grass species is essential. The presence of partially grazed areas and tracks made by herbivores further enhances habitat suitability. Control of invasive species such as Mikania micrantha and Ipomoea carnea is vital to maintaining the delicate ecosystem balance required to meet the specific habitat needs of the Bengal florican. In conclusion, sustaining a suitable environment for the Bengal florican involves a careful balance of various factors. By minimizing disturbances, particularly during critical months, and implementing measures like controlled grazing and maintaining optimal grass height, we can ensure the well-being of the species. Ultimately, preserving the unique habitat ecology of the Bengal florican necessitates a comprehensive approach that considers the interplay of biotic and anthropogenic factors.

Distribution and Population Dynamics

In 2023, 24 Bengal Floricans were observed, with 14 males and 10 females, showing a gender imbalance of 58.3% males. By 2024, the population increased to 32, with 20 males and 12 females, maintaining a male majority of 66.7%. This disparity is likely due to the males' distinctive black and white markings, making them more visible than the females' cryptic plumage and secretive nesting behaviors in dense grass. The presence of Bengal Floricans in isolated areas away from

human interference, near water bodies and suitable grazing grounds, highlights the importance of habitat quality and connectivity for their survival. Threats such as habitat encroachment, particularly from melon farming, underscore the urgent need to protect grassland habitats beyond designated protected areas. Local authorities must raise awareness and implement conservation measures to safeguard Bengal Florican populations and their habitats, ensuring the species' expansion and sustainability.

Key Observation

The study on Bengal Florican population distribution delved into habitat preferences, gender dynamics, and threats impacting these endangered birds. It revealed crucial insights into variations in population density, behavioral patterns, and habitat characteristics influencing their presence. The observations underscore the importance of conservation strategies tailored to specific habitat features and community involvement for effective Bengal Florican preservation. The study on Bengal Florican highlighted several key points. Population density variations were observed across different study blocks, indicating diverse habitat preferences and suitability, crucial for targeted conservation efforts. Gender disparity was notable, with equal counts of males and females, differing from past sightings skewed towards males. This was attributed to behavioral patterns, with males being more visible and females adopting a cryptic demeanor, likely for nesting. Habitat characteristics, especially grass species, and coverage, influenced Florican presence, with specific preferences noted for optimal grass height. Human activities and invasive species were identified as threats. Empowering local eco-guardians and collaborative stakeholder engagement effectively enhanced conservation efforts and resource mobilization. These observations underscore the complexity of Bengal Florican conservation, emphasizing the need for tailored strategies addressing habitat preferences, human impact, gender dynamics, and community involvement. Implementing targeted initiatives based on these significant characteristics can pave the way for the sustainable protection of this vulnerable species and its critical habitat.

Key Challenges

The Bengal florican habitat faces numerous challenges that threaten the survival of this endangered species. These challenges include conflicts between humans and wildlife, habitat conversion, fragmentation of farmlands, socio-economic practices, human interference during the breeding season, and habitat disturbances caused by feral cattle and human activities. It is crucial to address

these challenges effectively to ensure the conservation and protection of the Bengal florican and its habitat.

Conclusion

In conclusion, a comprehensive approach considering habitat needs, population dynamics, conservation strategies, and community engagement is crucial for ensuring the long-term survival of the Bengal florican. By addressing key challenges and fostering collaborative efforts, we can strive towards a sustainable coexistence between humans and this critically endangered species, preserving their unique habitat ecology for future generations. The habitat ecology of the Bengal Florican is intricately tied to various factors essential for its conservation and management. This highly selective species thrives in grasslands with specific grass species, optimal grass height, scattered trees, and proximity to water bodies. Balancing wild and domestic herbivores, controlling invasive species, and maintaining these habitat conditions are crucial for their well-being. Population dynamics show a gender imbalance, with more visible males due to their distinct markings and behaviors. Habitat quality and connectivity are vital, as isolated, undisturbed areas support their presence. Encroaching melon farming highlights the need to protect grasslands beyond reserves. Effective conservation involves engaging local communities as eco-guardians, raising awareness, restoring critical grasslands, and collaborating with stakeholders. These efforts, along with population monitoring and resource mobilization, are essential to safeguard the Bengal Florican's habitat. Despite challenges like human-wildlife conflicts, habitat conversion, farmland fragmentation, and breeding season disturbances, addressing these threats is vital. Prioritizing habitat protection, minimizing disturbances, and implementing sustainable management practices will secure a better future for the Bengal Florican and its ecosystem. A comprehensive approach considering habitat needs, population dynamics, and community engagement is crucial for their long-term survival, fostering sustainable coexistence between humans and this critically endangered species

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