A REPORT ON

"Wings of Hope: Population Monitoring and Conservation of Critically Endangered Bengal Florican in Chitwan National Park, Nepal"

Submitted to

Chitwan National Park
Kasara, Nepal

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Table of Contents

1. Introduction

The Bengal Florican (*Houbaropsis bengalensis*), a ground-dwelling grassland bustard, is categorized as Critically Endangered on the IUCN Red List and included in CITIES Appendix 1 (DNPWC, 2016; Bird Life International, 2023). Its global population ranges from 250 to 999 individuals across its geographic range, including Indian Sub-continent and Southeast Asia (Bird Life International 2023). In Nepal, it is found in the alluvial grasslands of Chitwan National Park (CNP), Bardia National Park, Koshi Tappu Wildlife Reserve, and Suklaphanta Wildlife Reserve (Inskipp and Collar, 1984; Poudel et al., 2008; Jha et al., 2018). This species tends to favor short grasses for foraging and displaying. However, tall grass is equally important for both males, providing shelter, and females, facilitating their breeding activities (Sovannary et al., 2022).

Male and female florican can be distinguished from their physical appearance. Males have black plumage and appear completely white during their flight, while females are buff brown and slightly larger than males. Female lays eggs on the ground under tall grass during their breeding season from March which lasts up to August, exhibiting breeding behavior in the early morning or late afternoon (Baral et al., 2002). Although males disappear at other times of the year, they are mostly conspicuous at the breeding season (Jha et al., 2018). Unfortunately, this breeding behavior coincides with the time of disturbance arising from human activities such as cattle rearing, and grass and dung collection, which greatly reduces the breeding success (DNPWC, 2016). Inattentiveness to this species has resulted in activities like plowing near the grasslands of CNP, which has a detrimental effect on grass species like *Narenga porphyrocoma* and *Saccharum benghalensis* (Baral et al., 2002). Furthermore, satellite tracking has revealed that these birds migrate from breeding areas to degraded farmlands near human-dominated areas after their breeding season (DNPWC, 2016). This migration makes them more vulnerable to disturbance, hunting, and collision with power lines, ultimately affecting their survival rate (Baral et al., 2013).

The small population of this species estimated under 100 individuals (Inskipp et al, 2016), combined with very low levels of conservation awareness among the local communities in Nepal, has led to an unprecedented decline in this species (DNPWC, 2016). Studies conducted in 2014-2015 recorded a low number of just six individuals in the Chitwan National Park (DNPWC, 2016). The lack of understanding regarding the species ecology and distribution is a significant reason for this situation which is hindering the development of effective conservation strategies (Sovannary et al., 2022). To bridge this critical gap in knowledge and conservation efforts, comprehensive studies should be carried out to understand the distribution of Bengal Florican and their connection with the grassland that hosts them, alongside the composition of other bird species.

2. Justification of Research

As a sensitive species, the presence and absence of Bengal Florican can act as an indicator to determine the overall health of the grassland ecosystem; their decline is the signal of loss of biodiversity and habitat degradation. Such a study will ultimately help in the conservation of many other species of Chitwan National Park like Hog deer, spotted deer, Lesser Adjutant stork, Eurasian Thick-knee, Peafowl, Lapwing, and assist in better habitat management. However, the lack of awareness in the local community and less understanding of species ecology is accelerating the decline in the population of Bengal Florican (Sovannary et al., 2022). Despite this, there is no long-term monitoring protocol for florican. To bridge this critical gap in conservation efforts, regular monitoring is carried out through this project.

3. Objectives

The overall aim of this project is to promote awareness among local communities and conduct population and nest monitoring of Critically Endangered Bengal Florican.

The specific objectives of this research work are:

1. To estimate the population abundance of Bengal Florican in the grassland of Chitwan National Park of Nepal.
2. To record the threats to Bengal Florican around the buffer zone of the Chitwan National Park.
3. To engage locals in capacity development training and conduct a school awareness program regarding the ecology of Bengal Florican for conservation of Species.

4. Methodology

4.1 Study Area

The study is conducted in Chitwan National Park (CNP), the oldest national park of Nepal, established in 1973 and declared as UNESCO World Heritage Site in 1984. It is situated in the inner Terai region of Chitwan, Makwanpur, Nawalparasi, and Parsa districts of Nepal. The region experiences tropical and subtropical bioclimatic zones, characterized by hot monsoons and winter seasons. CNP occupies an area of 952.63 km^2, with an additional 729.37 km^2 designated as a buffer zone aimed at reducing park-people conflict and the conservation of wildlife. It provides habitat for 643 bird species and 34 species are categorized as “Critically Endangered” including Bengal Florican (NTNCBCC and CNP, 2020). CNP predominantly features grassland dominated by *Imperata cylindrical, Saccharum spontaneum, and Desmostachya bipinnata*, making it a suitable habitat for Bengal Florican. This study covered all potential and suitable grassland habitat including Amrite, Padampur, Dumaria, Jarneli, Sukebhar, Buddanagar, which were selected based on historical sightings and gap analysis. Furthermore, the study also assessed the grasslands of the buffer zone to promote Bengal Florican conservation within the local community through a science-based awareness program.

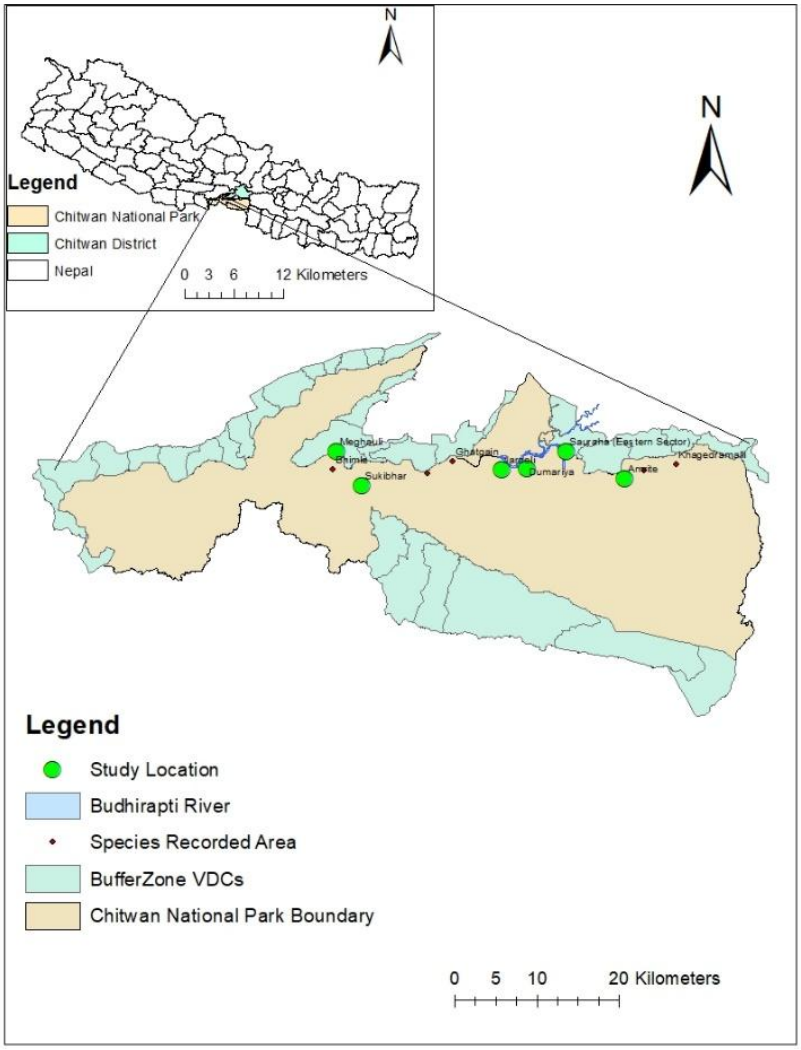

Fig 1- The Study Area Including the grasslands of Chitwan National Park

4.2 Methods

4.2.1 Site Selection

Suitable study sites were identified based on prior studies done in Chitwan National Park from 2013 to 2018 (Poudyal et al., 2008, Jha et al., 2018). All the areas with historical sightings were used to identify the target field. They are further selected based on the gaps and requirements mentioned in previous studies. Suitable habitats of Bengal Florican include Meghauli (Buddhanagar), Sukhebhar, Amrite and Sauraha (Padampur). Likewise, two potential habitats of Bengal Florican include Dumariya and Jarneli, selected based on high frequency of species sightings.

4.2.2 Population monitoring

A survey is carried out in potential grasslands using the methods of Baral et al., (2002), and peak breeding season, (February –April) is emphasized. The study is surveyed early in the morning (6-9 am) and later in the afternoon (3-6 pm).

A. Walk and Grid Analysis

In this method, each team members walk on grids at the distance of 20m, searching for each area without disturbing the species and recording the species' presence and absence. During the breeding season, male individuals show active territorial displays, and it will be easy to locate them. Binoculars are used to confirm the correct identification of the species recorded.

B. Vantage Points

Bengal Florican shares its grassland habitat with many potentially large animals (one- horned rhino, wild elephant, sloth bear, bison and bengal tiger) and keeping safety issues in concern and maintaining minimal disturbance to Florican, direct observation through vantage points is carried out in the place where walk in grassland is not feasible. The survey is done from safe vantage points, such as vehicle rooftops, observation watch towers, and elevated camps by using proper binoculars and zoom lenses. (Jha et al., 2018**).**

4.2.3 Threat Identification

Direct observation method is used during the species population monitoring to record the threats to Bengal Florican in its habitat (core are of Chitwan National Park and grasslands of Buffer Zone. The Key Informant Survey is done with buffer zone community members, nature guides of Chitwan National Park, bird expertise, members of Florican survey team 2023 and others related stakeholders.

4.2.4 Conservation Awareness and Capacity Development

The school program is conducted in 5 selected schools, including activities like Bengal Florican Conservation Club Formation. Monitoring training for the locals, ethnic people having high dependency in forest is conducted. Quiz Contest, Drama and drawing competition is done for the awareness program. Audio-Video Presentation, Chart Presentation and other visual materials are prepared for the awareness program.

5. Results and Discussion

5.1 Population and Habitat Monitoring

In Chitwan National Park, several grasslands are located along the floodplains of the Rapti and Reu River, which serve as potential habitats for the critically endangered Bengal Florican (*Houbaropsis bengalensis*). However, this study did not record any individuals in the year 2024-2025, underscoring critical concern. As shown in past research, the presence of grassland alone is not sufficient; habitat quality, grass composition, structure, and levels of human disturbance are key determinants influencing the species existence and breeding success (BirdLife International, 2023). The absence of sightings this year may reflect ongoing habitat degradation and disturbance, highlighting the urgent need for targeted grassland management and continued monitoring.

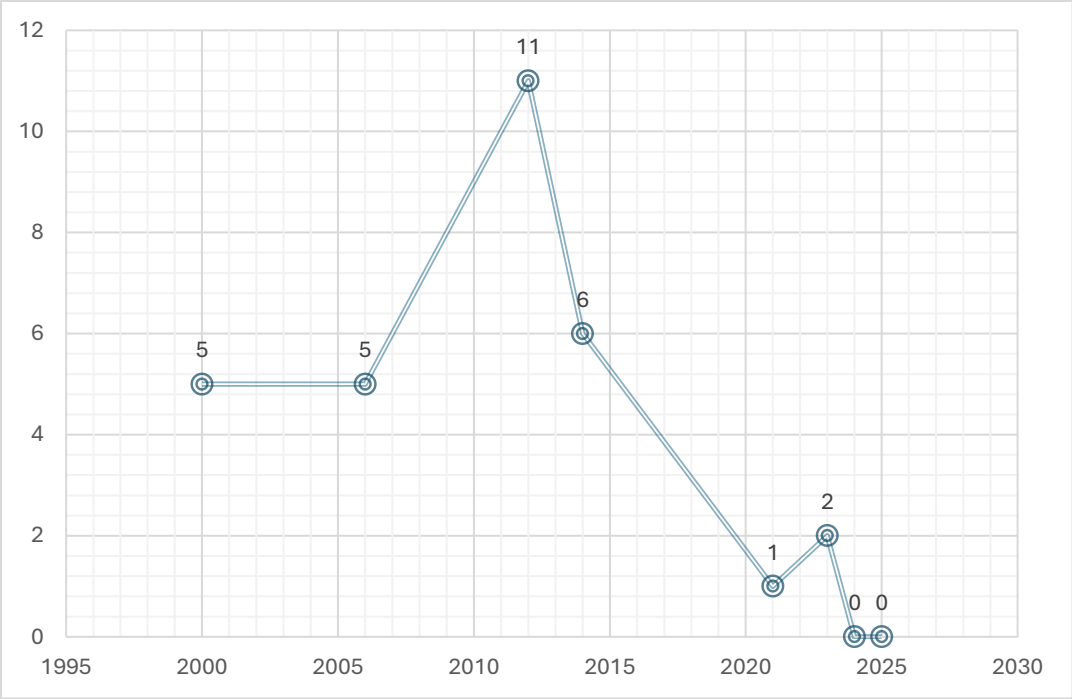

Figure 2: Population Trend of Florican in Chitwan National Park (data source, 1995-2024, (DNPWC, 2024)

The trend analysis based on monitoring records clearly shows a drastic decline in the Bengal Florican population in Chitwan National Park over the past two decades. From a stable population of around 5 individuals in 2000 and 2005, the numbers peaked at 11 in 2011, likely due to be improved habitat conditions or better detection efforts during that period (DNPWC, 2024). However, subsequent years show a sharp decline, 6 individuals in 2014, 1 in 2020, and only 2 in 2023 (DNPWC, 2024). Notably, no Bengal Floricans were recorded during the 2024 and 2025 monitoring periods, with the 2025 data being the outcome of this current study.

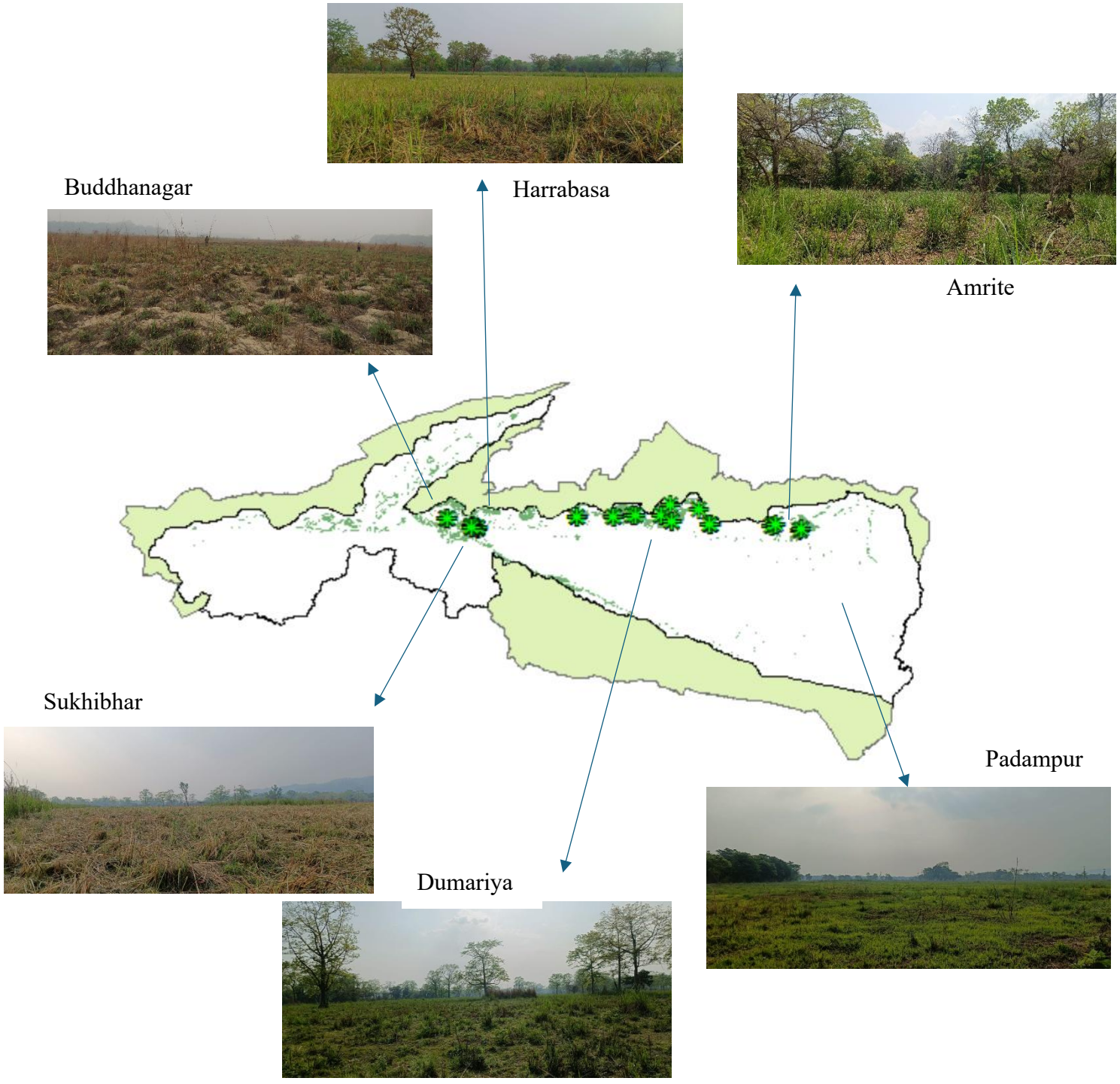

Figure 3: Picture showing the grasslands of Chitwan National Park during breeding season of Bengal Florican 2025

The grassland condition from July 2024 to May 2025 was observed in two seasonal windows: monsoon (July to September) and breeding season (February-May).

A. Monsoon Season (July – September 2024)

The grasslands experienced heavy rainfall in July and following the onset of monsoon rains, the grasslands in CNP experienced vigorous growth. Dominant grass species like *Saccharum spontaneum* (Kans), *Imperata cylindrica* (Siru), reached heights of 2–3 meters, forming dense, uniform stands. This level of growth, while important for herbivores like the one-horned rhinoceros, but unsuitable for Bengal Florican, as it reduced visibility for display and increased predator risk. Additionally, waterlogging in low-lying patches from sustained rainfall further reduced ground accessibility for florican movement and ground nesting.

Picture 1: Budhhanagar Grassland

Picture 2: Waterlogged grassland

Field visits were made in the buffer zone areas of Chitwan National Park especially Simara and Pachpandav area. During this season, these buffer zones offered more accessible conditions compared to the waterlogged core areas. They may serve as temporary refuse of future breeding grounds, especially if managed appropriately through habitat restoration.

Picture 3: Team in Field

Picture 4: Grasslands of Simara

B. Post-Monsoon and Dormant Phase (October 2024 – January 2025)

Picture 5: Post monsoon

These dry months are crucial for preparing controlled burns, which are a traditional and effective method to enhance Bengal Florican breeding habitat by clearing old, tall vegetation and encouraging new growth of short grasses (Baral et al., 2003). This period sets the stage for optimal breeding habitat regeneration in spring. However, no grassland management activities started during this period. The grass died but remain tall making it difficult for assessment.

C. Dry Season and Breeding Display Period (February – May 2025)

Picture 6: Grassland after forest fire

During the late February to early March period, controlled burning was seen in different parts of the grassland as a management practice. This burning helps remove tall, old vegetation and stimulates the growth of fresh grass shoots. Following the fires, new grass began to emerge, particularly in the burned zones. Among the early colonizers were species like *Cynodon dactylon* (locally known as Dubho) and young *Imperata* species, which established a low and sparse grass cover. This short and open vegetation structure is particularly suitable for the Bengal Florican's breeding behavior, as males prefer such areas to perform their display rituals—such as flutter jumps and loud booming calls—to attract females (Bird Life International, 2023).

Additionally, from February through April, mechanical grassland management was actively carried out using Rotary Mowers. During this period, the mowers were observed operating simultaneously in different sections of the grassland, systematically cutting down tall and dense grasses.

Picture 7: Mechanical Grassland Management

5.2 Awareness and capacity building Program

The students from both primary and secondary levels participated in the program. About 90% of the participants had no prior knowledge of the Bengal Florican, its critically endangered status, or its ecological significance. This highlighted a pressing gap in local awareness, particularly in regions close to the species remaining in habitat. However, at the end of session through interactive verbal quizzes and knowledge sharing session, over 80% of the students were able to correctly identify Bengal Florican. A targeted school awareness program was successfully conducted across five schools in the Meghauli, and Madi of Chitwan National Park buffer zone:

1. Shree Janaki Secondary School, Meghauli,
2. Shree Sajhapur Madhyamik Vidhyalaya, Meghauli
3. Brahma Jyoti Basic School, Madi
4. Shree National Basic School, Ratnapur (Seruwa)
5. National Basic School, Pandavnagar

Picture 8: Group photo after school program in Shree Sajhapur Madhyamik

A. Presentation and Discussion

The program focused on essential ecological knowledge regarding the Bengal Florican, including its breeding season, preferred grassland habitat, unique male display behavior, and the major anthropogenic threats, such as habitat degradation, and unsustainable grassland management. Visual presentations and interactive discussions were used to ensure engagement and understanding among students and teachers. After the educational session, students were encouraged to share the knowledge they gained, which helped in reinforcing key concepts and provided a platform to assess immediate learning outcomes.

B. Drawing competition

The drawing competition was organized to creatively assess students' understanding. An open drawing competition was held to encourage their imagination and over 500 students participated in the drawing competition. The participation was enthusiastic, and winners' 1st, 2nd and 3rd were acknowledged with awards to promote motivation and recognition.

Picture 9: Student drawing Bengal Florican

Picture 10 & 11: Students securing position

C. Quiz Context

As part of evaluating the effectiveness of the school awareness program on the Bengal Florican, a set of 20 structured questions covering key ecological, behavioral, and conservation aspects of the species was prepared and presented at the end of each session. These questions were asked in a mass-interactive format, where all students were encouraged to participate by responding verbally or through raised hands, promoting an inclusive and engaging learning environment.

The enthusiastic participation of the students and their ability to answer most of the questions correctly provided strong evidence that key messages were effectively communicated and absorbed during the session. Notably, many students who had initially never heard of the Bengal Florican were able to articulate accurate responses after the program, indicating a significant improvement in awareness and retention of knowledge within a short time frame.

Moreover, the use of a well-structured question set ensured consistency across all five schools, allowing for a uniform measurement of understanding and enabling future comparisons if the program is repeated. Overall, the high response rate and correctness of answers demonstrated that

the program was not only informative but also transformative in raising awareness about one of Nepal's most threatened bird species.

Picture 12: Students interacting in programs

D. Face Painting Activity

A face painting station was set up to attract and engage students and community members in a more informal and enjoyable manner. This creative activity not only brought excitement to the event but also helped reinforce species identification and visual recognition in a fun, memorable way.

Picture 13: Student participating in face painting

E. Bengal Florican Club Formation

At the conclusion of the school outreach program, a new *Bengal Florican Club* was established in selected schools to encourage ongoing awareness and conservation efforts among students. In schools that already had an existing eco club, Bengal Florican conservation was introduced as a key theme upon the request of school authorities. These clubs aim to engage students in spreading knowledge about the species, monitoring local grasslands, and promoting habitat conservation within their communities.

Picture 14: Members of Florican conservation club

F. Student Engagement and Feedback

After the presentations, students were given time to reflect on their learning and share their thoughts about the Bengal Florican and the overall program. This participatory approach helped assess the effectiveness of the presentation program and foster a deeper understanding of conservation messages.

Picture 15& 16: Student sharing their views about the program

G. Community Awareness Drama on Bengal Florican Conservation

A community-focused awareness drama was successfully conducted in Meghauli, hosted at the Tharu Homestay, with active participation from residents. The event was designed to educate the public on the ecology and conservation needs of the critically endangered Bengal Florican. The drama portrayed the habitat requirements, behavioral traits, and the major threats faced by the species—such as habitat loss, agricultural expansion, and human disturbances. It effectively highlighted the importance of preserving grassland ecosystems for the survival of the Bengal Florican. Through engaging storytelling and locally relatable characters, the performance fostered awareness among community members and emphasized their crucial role in protecting this unique

bird species. The event was well received by the audience, and it contributed significantly to enhancing community understanding and involvement in conservation efforts.

Picture 17, 18, 19, 20: Team Showing drama regarding Bengal Florican

H. Monitoring Training

The Bengal Florican Monitoring Training has been carried out. It is carried out in the buffer-zone area of Chitwan National Park in coordination with the Buffer Zone Madi Baghai Sector. A total of 30 individuals participated in the training and conservation officials were present in the interaction program. The individuals were from the ethnic communities; Bote, and Tharu and

Picture 21: local people engagement in capacity building program

there was the active participation of the woman, youths from Conservation Champaign, also from the elders of the society. The training covered a wide range of topics; introduction to the ecology of Bengal Florican, status and threats to Bengal Florican, conservation efforts, involvement of local people in Bengal Florican conservation, training on the uses of DSLR cameras, GPS, binoculars, and introduction to the book "Birds of Nepal". An expert ornithologist/nature guide was invited for the training and conservation officials were invited for the interaction program and as an encouragement to participants. Field execution was done in the grasslands of the buffer zone near the Sukhebhar area of Chitwan National Park, Panchpandav.

Picture 22: Youth champion of conservation expressing the views in capacity building program

Picture 23: Training local the methods of species monitoring

5.3. Threat Assessment

Direct observations of threats to the Bengal Florican were recorded during field visits. To enhance the effectiveness of this assessment, a key informant survey was conducted in consultation with nature guides and mahouts from the respective army sectors who regularly take elephants for grazing in the grasslands. The pie chart highlights the major threats to the Bengal Florican, with habitat loss (32%) and grassland modification (24%) being the most significant. Other contributing factors include grassland fire (22%), invasive species (11%), and local people's dependency on grasslands (11%). These results emphasize the urgent need for habitat conservation, sustainable grassland management, and community engagement to ensure the survival of this critically endangered species.

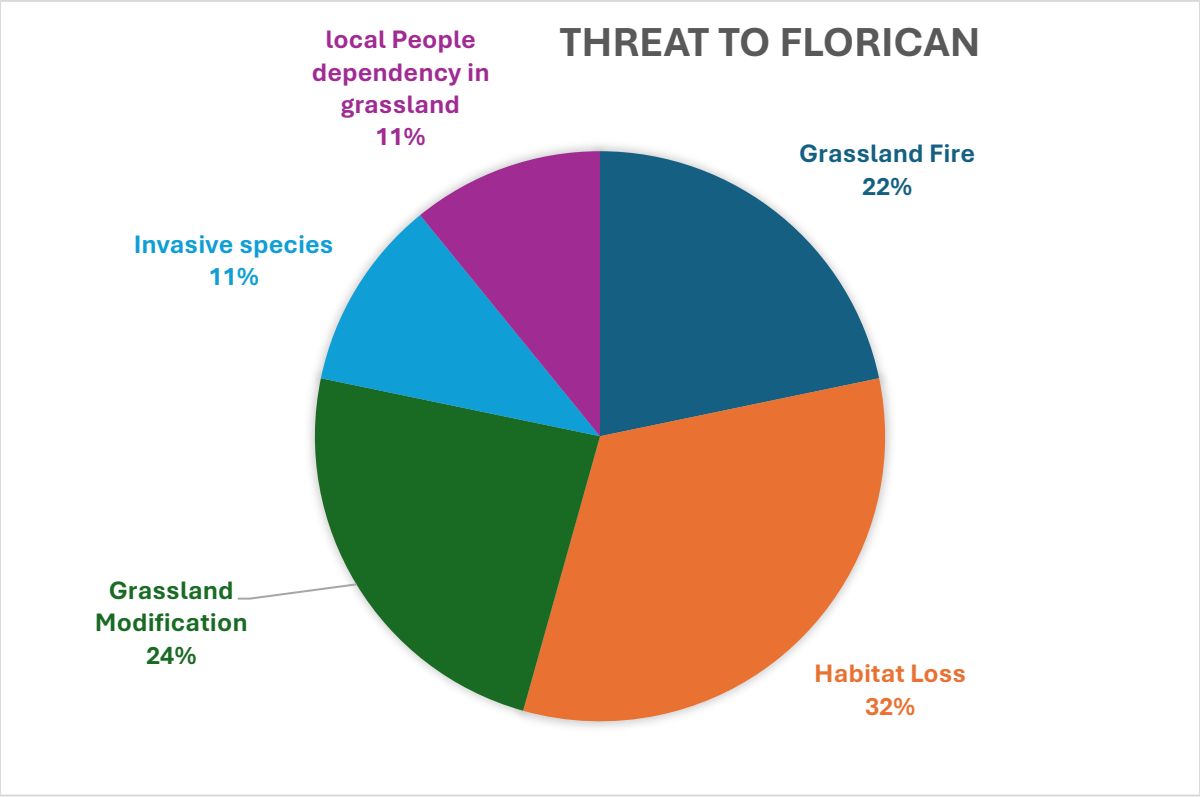

Figure 4: Pie chart showing the threats to florican

Picture 24 & 25: Locals in grassland for fodder (Left), rotator mower used for grassland management (right)

Picture 26, 27& 28: Grassland fire

Picture 29 & 30: Meeting nature guides for threat analysis(left), our team (right)

Picture 31: Key informant survey

Picture 32: Area of past sightings

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