PEP Project Final Report

Maximum ten pages. Annexes, including photographs to be attached/supplied as separate documents, but this text report must be sufficient to describe and report on the project

Globally Threatened Species:	**Great Indian Bustard (GIB)**
Date of report:	January 2023 (V1.0). March 2023 (V2.0). July 2023 (V3.0). Sep 2023 (V4.0). Dec 2023 (V4.1)
Name of project: Developing and implementing village-wise action plans with a network of local people to save Great Indian Bustard *Ardeotis nigriceps* (GIB) in non-protected areas of Thar desert, Rajasthan	
Duration: 1 November 2019 – 31 March 2023	
REPORT AGAINST PROPOSED ACTIVITIES Please report against each of the proposed activities in the original project plan. To what extent have they been carried out? Please keep the account concise, but use as much space as needed.	
FINANCIAL REPORT BRIEF BirdLife International supported BNHS for two years, from 2019 to 2021. During this period, BNHS also contacted other donors with proposals for smaller conservation projects and successfully secured funding to supplement project activities and partially achieve the project's goals. This allowed BNHS to save the budget under the BirdLife project and extend its duration by an additional two years till 2023. The dedicated team of individuals involved in the project demonstrated a long-term commitment and continue to advance the species conservation.	
A) Field set-up and involvement of locals *(= Objective 1: Set up a field base at Khetolai, Pokhran (near Field Firing Range) with a view of establishing a long-term bustard conservation programme* *+ Objective 3: Develop a network of skilled youth from villages located in key GIB distribution areas to monitor the birds and habitat under the BNHS-led long-term conservation programme)* In November-December 2019, a long-term program for GIB conservation was launched with the establishment of a base camp in Jaisalmer and a satellite field base in Khetolai, Pokhran. Khetolai is in the Pokhran tehsil of Jaisalmer district, 25 km from the tehsil headquarters and 85 km from the district headquarters. The village is home to the Bishnoi community, known for its commitment to nature conservation. The Gram Panchayat (village management council) is situated on the outskirts of the Government Restricted Area of the Pokhran Field Firing Range (PFFR). Dr. Sujit Narwade, Assistant Director of BNHS, oversees the program from Rajasthan. In March 2020, necessary equipment such as laptops, binoculars, GPS machines, range finders, monocular scopes, tripods, and monopods for survey and monitoring of birds, cookware, utensils, table, chair, almirah for stay were purchased within the budget to conduct surveys and research. From January to March 2020, essential staff/volunteers were recruited, including the following people. Part of their salary is covered through other projects. Other individuals are also involved who participate in different activities based on their needs and availability.	

1. Dr Neelkanth Bora, coordinates and manages the project work, conducts surveys, collects data, writes project reports, meets local leaders and administrative officers
2. Pankaj Bishnoi, from Khetolai village, Community Engagement Officer, mainly helping monitor the GIB and nature education program as a master trainer and linking with community
3. Sachin Bishnoi, a volunteer, is mainly involved in field surveys and data collection who recently got shifted to Ajmer for Lesser Florican project work

To monitor the engagement of our community members in project-related endeavours, we involved local volunteers as it allowed us to understand the contributions of the community members better and identify areas where additional support may be needed, as per their availability. Three individuals are essential in monitoring and collecting data on birds and wildlife in their respective villages and surrounding areas.

1. Firstly, Mr Dharmendra Pooniya was a site coordinator from Loharki village who focused on monitoring GIB and collecting data.
2. Secondly, Mr Musa Khan, from Neemba Village, Desert National Park (DNP), is a volunteer who provides data on birds and other wildlife he encounters while conducting tourist camps.
3. Lastly, Mr Sumer Singh Bhati from village Sanwata is a GIB friend ("Godawan Mitra" in Hindi) who monitors bird mortality caused by collisions with power lines and wind turbines near Degrai Mata Oran.

During the non-breeding season, the GIB population spreads beyond the Pokhran Field Firing Range (PFFR) and can be found in nearby villages, Orans, farmlands, and fallow lands. Therefore, fifteen local people from five different villages - Khetolai, Loharki Chacha, Odhaniya, Dholiya, and Sanwata - were selected to participate in various project activities related to GIB conservation. These individuals include farmers, grazers, and unemployed youth who provide valuable on-ground information about the birds and their movements during the non-breeding season. Their involvement in the project activities varied depending on the requirements, such as conducting more monitoring in nearby villages when the birds were present. As a token of appreciation, they receive an honorarium as *Godawan Mitra* based on their contributions. Some individuals were also provided with binoculars and cameras from June to September 2020 to aid in monitoring efforts; necessary training was provided to the recruited staff, volunteers, and Godawan Mitra to watch the birds, understand the ecology of the species, their habitat, its conservation needs, and how to compile and share the data.

The BNHS Bustard Project Data collection app was developed by the Environmental Information Awareness Capacity Building and Livelihood Programme (EIACP) – a Resource Partner on Avian ecology to collect the data in an efficient and paperless manner. The app has been used regularly by the project team.

Efforts to monitor and protect the GIB population in Rajasthan's DNP, Khetolai, Pokhran, and surrounding areas have been ongoing. To better understand the birds' micro-habitat requirements and movements, previous and current sightings were taken into consideration when planning surveys in other districts such as Jaisalmer, Barmer, Bikaner, and Jodhpur. A systematic grid-based vehicle survey was conducted across an approximate area of 36,000 sq. km, divided into grids of 225 sq. km (15 km × 15 km) each, excluding human-populated sites. The surveys were conducted during early morning and late afternoon hours from late August 2020 to the first week of April 2021, with a vehicle speed maintained at 15-20 km/hr to maximise the likelihood of observing active birds and animals. These surveys involved the co-operations and engagement of the locals.

Based on our landscape-level distribution surveys, it was clear that the only sustainable populations of GIB in the Thar Desert are confined to three small pockets, including the Desert National Park, on the boundary of India-Pakistan (near Bahawalpur where Pakistan declared a GIB sanctuary) and Pokhran (Figure 1). Degrai Mata Oran, once an excellent habitat for these birds, has unfortunately become a death trap due to high-tension power lines and renewable energy projects. As a result, ongoing efforts to protect the GIB population have also included working with the Border Security Force (BSF) to better understand and mitigate the impact of human activities on this endangered species. Based on direct and indirect sightings of GIB in the landscape, consider feathers, footprints, and faecal matter as indirect sightings distribution maps are refined.

B) Developing micro plans and community-conserved areas for village-level conservation actions: assistance to the community will help design a community-led habitat management model which can operate as a self-sufficient mechanism for GIB conservation through initial capacity building *(= Objective 2: Engage the Bishnoi community in developing village-level management plans and Bustard Community Conserved Areas (BCCAs) for saving GIB)*

In close collaboration with local youth actively engaged in the project, our team dedicated the initial few months to studying the Khetolai Gram Panchayat and the surrounding villages of Odhaniya, Chacha, Loharki, and Dholiya. These areas are where the GIB is present throughout the year, but primarily during the winter season. The field staff conducted a village-level survey to collect information on the socio-economic status of the region with the help of the village-level administration (Gram Panchayat). This data included the human population, medical facilities, number of schools in the village, livestock population, and major crops cultivated in these villages. Within these villages, a substantial amount of land - approximately 60 per cent - is allocated for rainfed arable use. Another 10 percent is designated for cattle grazing, while the remaining land is for residential purposes. The agricultural industry within the village heavily relies on the Barani or monsoon rains, which occur during the sowing season that spans from July to August. This period is known as the *Kharif* (monsoon) cropping season, and during this time, the major crops grown include Bajra, Jowar, Gawar, Til (sesame), Moong, and Moth. The Rabi cropping season (winter) follows this season, which comes after pre-winter showers. During this season, crops such as Taramira are harvested in late spring, specifically from February to March. The crops grown within the village include Bajra, Gwar, Jawar, Til, Moong, Matki, Moth Beans, and Taramira, primarily used for food, fodder, and as a source of income. Most of the produce is sold at the village level to middlemen or buyers, while some farmers sell their crops in Pokhran. It is worth noting that the nearest government-regulated agricultural produce market is in Phalodi, which is approximately 70 km away from the village.

Additionally, small-scale landscape surveys were conducted to understand the surrounding natural habitat better and based on the distribution of GIB, BNHS strategically decided to work at three sites: Desert National Park (Sam), Pokhran (primarily Khetolai, Chacha, Odhaniya, Chandani, Loharki), and Devikot (Sanwata, Rasla). The major activities included developing enclosures (already initiated around BNHS base camp, Khetolai with plans to have more in adjacent areas of PFFR), rejuvenation of Naadi (water bodies) for continuous availability of drinking water for wildlife (Khetolai), habitat restoration (at Chacha and Odhaniya villages), advocacy and policy (at Loharki and Chandani villages for stopping further growth of new renewable energy projects), and monitoring the mortalities of birds due to collision with HT powerlines (at Sanwata).

Our village-level mapping in Khetolai, Dholiya, and Loharki revealed that the GIB extensively utilizes the land falling under the administrative boundaries of Gram Panchayat in these villages. The area is a mosaic of farmlands, grasslands, and fallow lands, and it is an essential habitat for the bustards as they teach their young ones the basic skill set necessary for survival. This information provided more detailed insights into the efforts to be undertaken by BNHS and the importance of preserving the GIB's natural habitat for its survival.

The villages of Khetolai, Dholiya, Sanwata, and Loharki, where a considerable population of GIB is still reported, face significant conservation challenges.

1) In **Loharki**, the issue of poaching has become a significant concern, particularly about Chinkara and Spiny-tailed Lizard. The Indian Army, Kamlesh Kumar (assistant Forester), the Bishnoi community came together to combat this issue.
2) The dense vegetation of *Prosopis juliflora* is another pressing issue in **Khetolai**, as it is encroaching on the native grassland habitat and posing a challenge to the local wildlife. Additionally, Ranging Dogs and wild boars are causing difficulties for wildlife populations, leading regulatory bodies to implement authorised procedures to manage their numbers. The rise in livestock population has also led to intensive grazing pressure, negatively impacting the habitat. Efforts are being made to develop new enclosures to preserve the habitat.
3) In **Dholiya**, the primary concern is the free-ranging dog population, which has been seen to hunt down chinkaras and other native wildlife. Moreover, the Bhadariya Rai Goshala (which

houses abandoned cattle) has approximately 30 to 35 thousand cows released to graze in nearby sacred groves and common grazing lands during summers when fodder is scarce. This extra pressure on the grassland habitat is a significant concern that must be urgently addressed.

4) Village **Sanwata** is the area where birds are getting killed due to the network of newly installed powerlines is getting monitored for bird mortality through community people

To promote conservation efforts in the Bishnoi Community Conserved Areas (BCCA) and its surrounding regions, BNHS launched an initiative in January 2021. However, due to rumours about potential relocation of villages by conservation NGOs, residents put the plan on hold for the time being. Considering this setback, BNHS sought out like-minded individuals in Khetolai who agreed to spare their land to preserve native wildlife. In March 2023, the organisation established a 35-hectare fenced area near the Khetolai field base, which has since become a hotspot for GIB thanks to the generous CSR funding provided by SITA. Three to four individuals of GIB have occasionally been spotted in the enclosure.

As a result of this success, the BNHS purchased an additional 8.7 hectares of land near the field base in Khetolai and Chanani Panchayat using a land-blocking strategy to prevent the expansion of new renewable projects inside the last refuge of GIB. This plot is being considered for the land banking process, where several infrastructure projects are planned. The goal of this process is to help prevent the entry of new infrastructure into some of the last remaining habitats of the GIB. Looking ahead, BNHS aims to expand this area by acquiring more land and creating grassland enclosures. By doing so, the organisation hopes to create a safe and protected environment for the GIB and other native wildlife to thrive and continue to play a vital role in India's ecosystem

C) **Habitat restoration to improve habitat suitability for the birds.**

Prosopis juliflora, where GIB visits will be removed with the help of the village Panchayat in a 300-ha area in Khetolai. Pastures sown with native grasses will be developed as pilot plots in a 30 ha at farmlands in Khetolai *(=Objective 4: Restore GIB habitat by removal of invasive species and creating suitable pastures)*

Protecting the grasslands surrounding the Gram Panchayat is crucial to preserving the GIB's habitat in Khetolai village and its environs. Unfortunately, the invasive *Prosopis juliflora* had taken over the open grasslands, uncultivated farms, roadsides, and water bodies, causing concern among the locals. The Gram Panchayat sought assistance from BNHS to remove this invasive species from the catchment area of two water bodies, Navi Naadi and Juni Naadi, the only water sources for the area's wildlife. It was observed that GIBs frequented these water bodies for drinking water, and the dense thickets were home to the free-ranging dogs hunting Chinkara while visiting the waterbody. The senior members of BNHS decided to provide the Gram Panchayat with technical, scientific, and financial support to address this issue.

The BNHS conducted a thorough survey of the area, collected coordinates, and prepared a polygon with a high density of *Prosopis juliflora*. The catchment area of the Naadi was then restored with the help of mud excavators and labourers, who hand-cleaned the area to ensure that no native floral species were affected. 300 ha of scattered patches with dense *P. juliflora* vegetation spread over 2000 ha were restored, significantly benefiting the GIB and other native wildlife. The restored land is now used by wildlife for foraging, roosting, and drinking water. This has encouraged the locals, particularly the Gram Panchayat, to act against the exotic plant in their boundaries. The efforts of the BNHS and the Gram Panchayat have resulted in the restoration of the catchment area and a significant improvement in the habitat of the GIB and other native wildlife. A project was undertaken to restore grasslands and plant native Sevan grass *Lasiurus scindicus* in plots where *P. juliflora* had previously been removed. Further surveys revealed that around 5000 ha of land was infested with *Prosopis juliflora* in Khetolai and neighbouring villages.

Separately, Mr. Nathuram, a farmer from Dholiya village, cultivated Sevan grass as stock fodder in a sizeable 10-hectare area where GIB is seen in the winter. BNHS plans to collect the stumps of Sevan grass, which can be purchased and translocated to develop similar models elsewhere.

The Gram Panchayat approached BNHS for assistance in creating plots of Sevan, and two adjacent plots were chosen for developing grassland enclosures. In one plot of 25 hectares, fencing was erected by the Gram Panchayat with the financial support of Zila Parishad. The other plot of similar size was opted for sowing Sevan grass seeds, and BNHS provided the scientific and technical help needed for the project's success. BNHS arranged for an experienced farmer from Jaisalmer district to conduct a hands-on training program for the locals. The program covered several aspects, including sowing around 5 kg seed mixture on one bigha land (0.11 ha), soaking seeds in water overnight for imbibition and increased germination rate, mixing soaked seeds with 80% soil and 10% cow dung as seed balls, identifying various grasses in nearby areas, ploughing the selected plot, and sowing seeds at a depth of 4 to 6 centimetres. It was observed that only 5% to 10% of the Sevan grass seeds germinated in the open plot, whereas 20% to 25% of the seeds grew in the fenced plot. The findings of this pilot experiment were insightful and provided valuable knowledge for future projects aimed at restoring grasslands. The success of this project is a testament to the power of collaboration and the importance of preserving our natural resources.

D) **Advocacy to mitigate threats** like collision with power transmission lines, habitat destruction due to new renewable energy projects coming up, free ranging dogs, overgrazing, etc. in proposed BCCA and its surroundings.
(=Objective 5 [part]: Increased advocacy to mitigate threats by power lines)

From September to December 2020, BNHS collaborated with BirdLife International and received assistance from the International Finance Corporation (IFC) to perform comprehensive surveys on the current and upcoming developments that could impact the Great Indian Bustard (GIB) population. The landscape-level surveys conducted in the Thar Desert resulted in a sensitivity mapping report submitted to IFC as a reliable tool for making informed investment decisions within the energy sector (Figure 2). IFC follows the recommendations outlined in the sensitivity mapping report when investing in new renewable energy projects in the Thar Desert. The sensitivity mapping report provides an in-depth analysis of the potential impacts of various development projects on the GIB population and its habitat while also suggesting measures that should be undertaken to mitigate such effects. The sensitivity mapping report is available as an annexure. It is a valuable resource for policymakers, developers, and other stakeholders concerned with conserving the GIB population and its habitat. Overall, the collaborative efforts of BNHS, BirdLife International, and IFC have resulted in a proactive approach towards sustainable development, which prioritises the protection and conservation of the Thar Desert's unique biodiversity.

<u>GIB and raptors in Deg Rai Mata Oran and surroundings</u>
The Deg Rai Mata Oran, a sacred forest that envelops the Deg Rai Mata temple, is situated in the Fatehgarh tehsil of Jaisalmer district, approximately 50 km east of Jaisalmer city. This area was once a favoured habitat for the GIB, and Asad Rahmani spotted GIB on several occasions during his surveys between the 1980s and 2000s. In 2016, Durga Ram, a Forest Guard, confirmed that a male and female GIB were spotted inside the satellite enclosure which was created by the Desert National Park authorities at the Oran during the period 1988 - 1991. However, until 2022, no confirmed sightings of GIB were reported from this area. During a site visit in February 2023, BNHS recorded three females and one young male GIB in the area.

On 16 September 2020, a GIB was electrocuted in Deg Rai Mata Oran, confirming the locals' unconfirmed sighting records of GIB. This tragic event raised concerns about the impact of powerlines on avifauna, leading BNHS to conduct a pilot study on the issue with the assistance of Sumer Singh Bhati, a local of Sanwata village, and his shepherd network between December 2020 and February 2021. Upon receiving secondary information from the network over the phone, the site was immediately visited, and photographs of the dead or injured birds were taken for identification purposes. GPS coordinates were recorded to prepare bird mortality distribution data.

For the people of Deg Rai Mata Oran, the female GIB that died due to the powerlines, Rasla, was considered the daughter of the Oran ("Oran Ki Beti" in Hindi). The locals and the Deg Rai Mata Oran Trust decided to build a memorial, the first of its kind and requested technical and financial support from the BNHS. As a result, a life-size marble statue of the GIB was installed, and an event was organized on April 11, 2022, chaired by Sh. Kulwant Rai Sharma, CO, Border Security Force, co-chaired by former

Director, BNHS, Dr. Bivash Pandav. The event paid tribute to Rasla and aimed to raise awareness about the importance of preserving the GIB's habitat. Unfortunately, on 17 October 2022, another young female GIB died due to a powerline in Deg Rai Mata Oran, highlighting the need for urgent action to prevent further loss of this endangered species.

E) **Collaboration with Defence/Indian Army for GIB conservation**

To seek permissions for surveys of GIB in Pokhran Field Firing Range and conduct an awareness campaign *(=Objective 5 [part]: Increased advocacy by outreach with the Indian army)*

GIB can be found within the Indian army base - Pokhran Field Firing Range (PFFR) throughout the year. However, it selects several areas to venture out to nearby farmlands during winter. Between November 2019 and January 2021, a diligent and consistent monitoring process was conducted at the surrounding villages of PFFR for the purpose of estimating the exact number and movement of GIBs. As for the core area of the PFFR, a survey was conducted in November 2020 and January 2021, which covered an extensive grid-based area of 15 km. × 15 km. The survey was conducted on accessible dirt roads ranging from 25 ± 5 km long, either continuous or broken tracks, depending on accessibility. To better understand the movements and behaviours of incredible creatures, a team from the BNHS regularly conducts surveys within the PFFR and seasonal surveys in the surrounding areas. These efforts provide valuable insight into the lives of the GIB, ultimately aiding in conservation efforts and protecting their habitat.

Apart from GIB, 91 bird species, including the Critically Endangered Sociable Lapwing *Vanellus gregarious;* Endangered Egyptian Vulture *Neophron percnopterus* and Steppe Eagle *Aquila nipalensis;* Vulnerable Common Pochard *Aythya ferina*, Eastern Imperial Eagle *Aquila heliaca*, MacQueen's Bustard *Chlamydotis macqueenii*, Tawny Eagle *Aquila rapax,* and Yellow-eyed Pigeon *Columba eversmanni* were seen here. PFFR and the adjoining areas are the most promising sites and the last refuge for the wild population of GIB, which shall be spared from any infrastructures like solar, wind projects, and high-tension powerlines.

1. It is imperative that seasonal surveys are conducted to ensure the survival of Bustards in PFFR.
2. Sensitizing units that come for training to halt illegal hunting/taking in fringes of PFFR
3. Crucial steps include restoring habitats, promoting grassland development, and controlling overgrazing by creating grassland reserves and allowing the systematic manual harvest of fodder within PFFR and surrounding villages.
4. It is of utmost importance to address the issue of free-ranging dogs and find permissible and feasible measures within PFFR and surrounding villages.
5. Lastly, immediate measures must be taken to address threats to habitat and species, such as collisions with power lines, and providing mitigation measures is crucial

To create a safe and secure breeding habitat for bustards,

There are plans to establish four grassland reserve sites within the PFFR area, spanning 950 hectares. These sites will be managed and monitored by the BNHS, with support from the Indian Army. You can see a detailed map in Figure 4 attached in the annexure. The main goal is to protect the grasslands from excessive grazing by the growing livestock population. Predator-proof fencing will also be erected to prevent natural predators, including Indian Fox, Desert Fox, and Desert Cat, as well as intruders such as free-ranging Dogs and wild boars. Observation points will be set up in each reserve, and the BNHS staff will monitor the GIB weekly. Display boards were installed at the BSF area on the boundary of India and Pakistan near Tanot and the campus of PFFR HQ in Pokhran as outreach and awareness material.

F. Other activities carried out in addition to those reported above:

BNHS with additional funding from YES Bank, SITA, and IFC, has launched several successful initiatives.

1. YES Bank's contributions were instrumental in strengthening the GIB project. These contributions were used towards landscape surveys, establishing a robust local network, habitat restoration efforts, and human resource development.

2. SITA Inc. funding was utilised to support a comprehensive nature education program for schoolchildren who resided in nearby villages. The nature education program, which consisted of four phases, included an introductory phase, on-campus activities for students, nature trails, and annual function programs to recognise the efforts of school administrators and students.
3. SITA also supported a community-based nature conservation program that involved the construction of a carcass dump for vultures, water body rejuvenation, and creation artificial water holes.
4. With financial backing from SITA, a grassland reserve (35 ha in size at the Khetolai field base) was established with the assistance of the Indian Army and the Bishnoi community. This reserve now serves as a safe and secure habitat for birds, where they can thrive without fear of hostility from the surrounding land and sky. SITA also played a vital role in facilitating the project's activities.
5. IFC supported BNHS and BirdLife in conducting avian sensitivity mapping and cumulative impact assessment for the Thar Desert. This research has been instrumental in helping to identify areas that are particularly sensitive to environmental change and has played a significant role in preserving the delicate balance between nature and human activities in the region

REPORT AGAINST EXPECTED OUTCOMES

Please report against each of the expected Outcomes in the original project plan. To what extent have they been achieved? To what extent has the species directly benefited them? Please keep the account concise, but use as much space as needed.

Please avoid repetition from Activities and Objectives above – only provide additional detail where specified as outcome or target statements as listed below.

1. Groundwork for the implementation of a long-term program established.	Certainly! The support provided by BirdLife was instrumental in assisting BNHS to establish the essential foundation
2. Key project personnel recruited, including the programme officer and two site coordinators.	Yes, each of them has demonstrated a consistent dedication to the program over an extended period.
3. Twelve local youths will be selected as GIB friends and get trained for the implementation of the project activities	We accomplished our goal entirely and, as a result, gained significant backing from the community
4. A population of at least 30-40 GIB monitored regularly in Khetolai and its surroundings to understand the micro-habitat requirements and movements of the birds	The monitoring program led to collaboration between the Indian Army and the surrounding villages. The population of GIB is currently stable and showing slight growth.
5. Village-level micro plan for Khetolai village developed and process for other two adjoining villages to be started	A plan has not only been developed but it has also been fully implemented with financial support from various donors
6. Process of developing BCCAs initiated. By the end of the project, 2-3 CCAs to be developed and maintained	Locals are uncomfortable with legal entities like CCA, and BNHS is exploring private grassland reserves developed in partnership with selected Bishnoi people.
7. Habitat restoration work carried out through village panchayats and invasive plants like *Prosopis juliflora* from 30 Ha area removed	With community support, habitat restoration efforts have eradicated P. juliflora in Khetolai village, leaving only a few remaining invasive trees near settlements
8. With the help of farmers involved in BCCA, two pastures of 50 Ha and two plots of 50 Ha	A 35-hectare plot has been converted into grassland that bustards use in the winter

are to be selected for the pilot to understand control grazing	
9. Diverters in particular lines on a pilot basis to understand the diverters' technology requirements, efficacy, durability, etc.	BNHS is not pursuing this objective. Instead, the team is proposing to underground two power lines totaling 35 ha in the Pokhran area
10. Dialogue initiated with the Indian army and at least one event organised with selected staff of Pokhran Field Firing Range	Indian Army invited BNHS for GIB conservation discussion during "Prakriti Sanrakshan" at Jodhpur's 12 Corps HQ on Dec. 22, 2022
Other results achieved for this species (or other threatened species) Publications	1. Notes on threatened raptors seen during a landscape survey in Jaisalmer district, Thar Desert, Rajasthan. JBNHS April 2023 (Figure 6) and annexure 2. 2. Annotated Checklist of the Birds of the Desert National Park, Rajasthan. it is scheduled for the September–December 2023 issue.

FUTURE PLAN OF WORK

Please summarise what work you are planning to undertake in the future.

Below are the proposed actions for conserving the Great Indian Bustard (GIB) habitat. These measures have been developed with the utmost care and attention to detail to preserve this species for future generations.

1. The Indian Army has agreed to play a critical role in conserving the GIB habitat. They will assist BNHS in finalizing the sites for five grassland reserves, constructing fences around selected reserves, and building watchtowers in the near future. This will help protect the habitat from human encroachment, ensure the birds' safety, and allow for better behaviour monitoring. BNHS staff will be given permission and necessary equipment to monitor birds and their habitat inside PFFR, with more intense monitoring during the monsoon season. This will enable BNHS to gather more accurate data on the GIB population and assess the effectiveness of conservation efforts. Assistance will be provided in installing bird diverters on a powerline passing from Gomat to Khetolai to prevent birds from moving out of PFFR during the firing exercise from October 2023 to March 2024. This will help reduce the risk of injury or death to the birds.
2. Village gram panchayats around the Indian Army area will help remove the invasive exotic *Prosopis juliflor*a, sow native grass seeds, and develop grasslands. This will help create a more suitable habitat for the birds and promote the growth of native plant species.
3. The Supreme Court's order to underground the powerline over 78,000 km has yet to be implemented. Therefore, BNHS will focus on undergrounding 35 km of line in the Pokhran area (Figure 4). This will help reduce the risk of injury or death to the birds from powerline collisions. The undergrounding work is expected to be supported by the Rajasthan Rajya Vidyut Prasaran Nigam Ltd (RRVPNL) and partly through CSR funding to be raised by BNHS.
4. A key strategy in developing a bustard-friendly habitat is to create additional enclosures by purchasing and developing them on leased land with like-minded people. This intervention will help expand the bird's available habitat and reduce their risk of predation by other animals.
5. The adult GIB faces less threat from natural predators in the Thar but is susceptible to free-ranging dogs that can predate on its eggs and young ones. A plan is in place to work with local administrative bodies and experts on Animal Birth Control programs through sterilization and immunization procedures and to control free-ranging dogs. This will help reduce the impact of predators on the GIB population and promote their long-term survival.
6. Purchasing land to create bustard reserves and co-management with the community will also be pursued. Moving forward, the focus will be on the GIB monitoring plan, removing *P. juliflora*, grassland and river catchment restoration, although these plans are subject to funding availability. Seeing a vision emerge and be documented as the PEP project ends is encouraging. We remain optimistic that these efforts will help ensure the long-term survival of the GIB and its habitat.

CHANGES IN STATUS/DISTRIBUTION/THREATS

Please provide your views on whether the species' status and habitat have changed since the last report and why. If this is backed up by monitoring activities, please provide details.

During 2022 and 2023, the Pokhran area witnessed the successful conservation of 5- 6 chicks and juveniles. This positive outcome was made possible thanks to the dedicated efforts of the Indian Army and the Bishnoi community. Their steadfast support and commitment to conservation played a pivotal role in ensuring the well-being and survival of these birds. This achievement is a testament to the importance of collaborative efforts in preserving endangered species.

SPECIES FACTSHEET

Please download the species factsheet for this species from http://datazone.birdlife.org/species/factsheet/great-indian-bustard-ardeotis-nigriceps, paste it into word, and add any updates, additions and corrections using track changes. These will then be incorporated into the next update of the factsheet for the BirdLife website.

ANNEX - In addition to the above, as appropriate, please provide digital photos of project activities, copies of any awareness materials, and copies of other reports or papers which have been produced. These will help us promote the project.

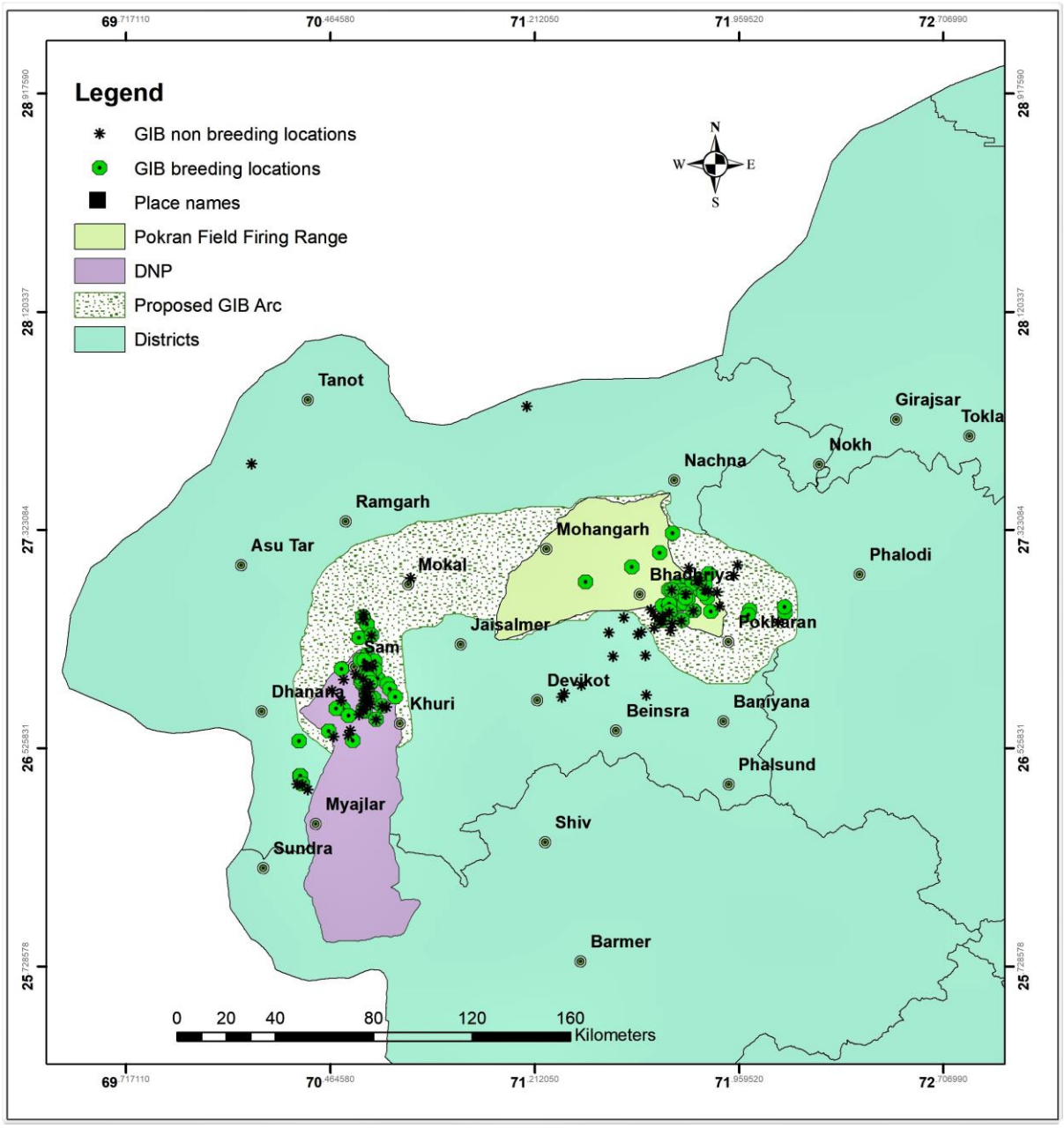


Figure 1 Distribution map of GIB based on landscape surveys conducted in year 2020-2021 followed by regular site-based monitoring

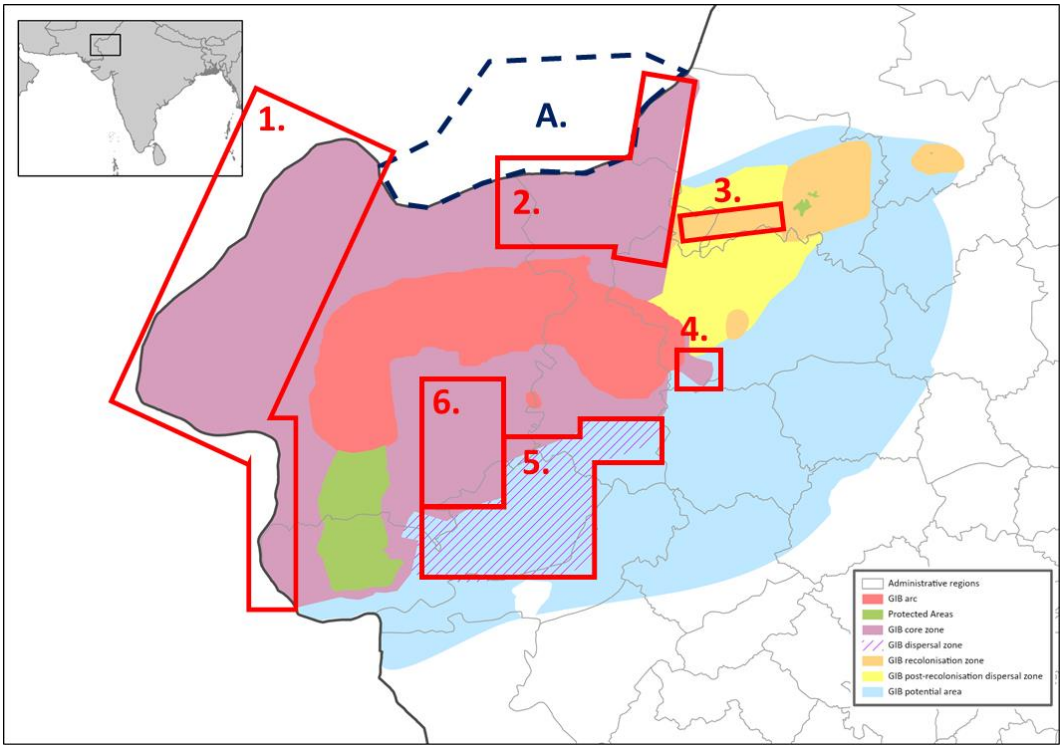


Figure 2 Avian sensitivity mapping done for the Thar Desert in collaboration with BirdLife International and IFC which helped BNHS to streamline the conservation efforts

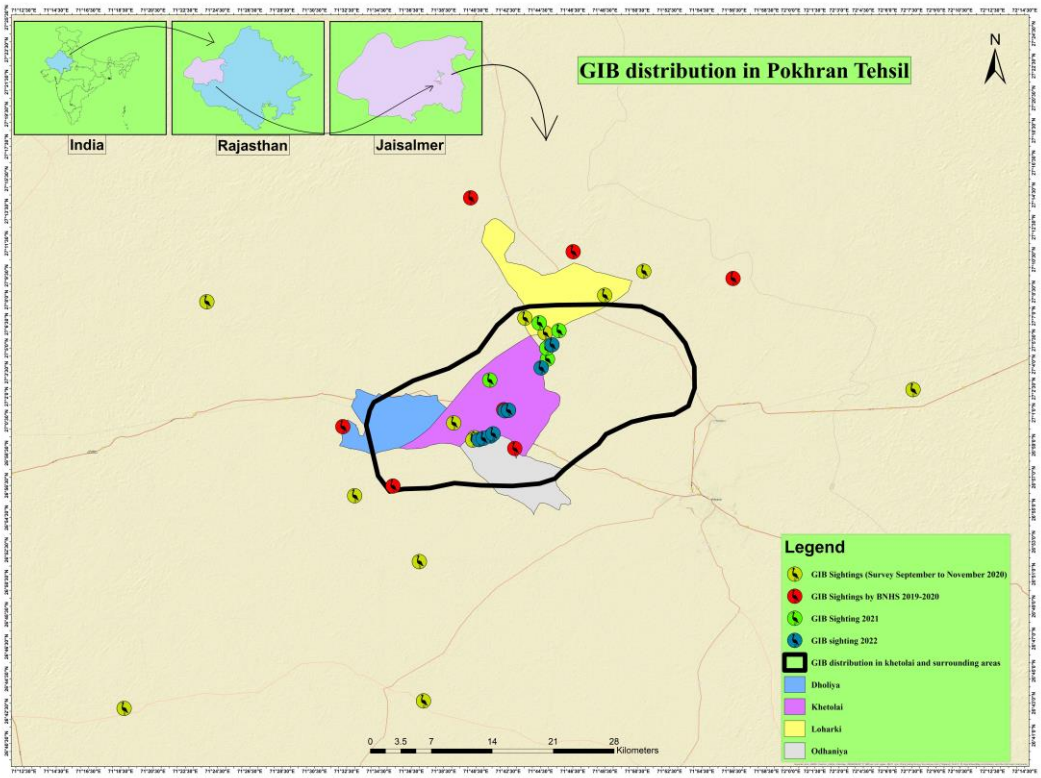


Figure 3 Village administrative boundaries and GIB distribution in Khetolai and surrounding Panchayats.

Image 01. Area in Khetolai village chosen for undertaking habitat restoration work © Sujit Narwade

Image 02. Exotic and invasive plant Prosopis juliflora being removed with the help of local people © Sujit Narwade

Image 03. View of the partially restored habitat © Sujit Narwade

Image 04. (Left) - Footprint of GIB (without hind claw) seen on a dried waterbody adjacent to the restored area © Neelkanth Bora; (right) - Chinkara droppings were seen immediately on next day after the removal of Prosopis juliflora. © Sujit Narwade

Image 05. Preparation of Sewan grass seed balls for developing a grassland plot © Neelkanth Bora

Image 06. Dr Anuj Jain (left) of BirdLife International was seen with BNHS staff during his visit to the project site. BirdLife extended support towards initial field setup, pilot habitat restoration work, and the purchase of equipment for the GIB project.

Image 07. BNHS staff provided hands-on training to students during a nature trail

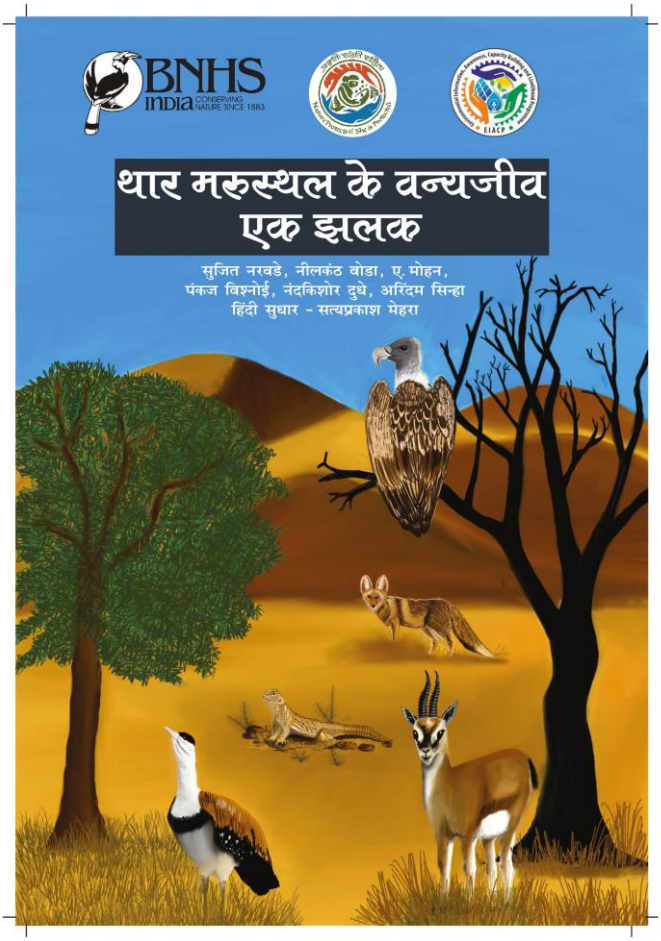
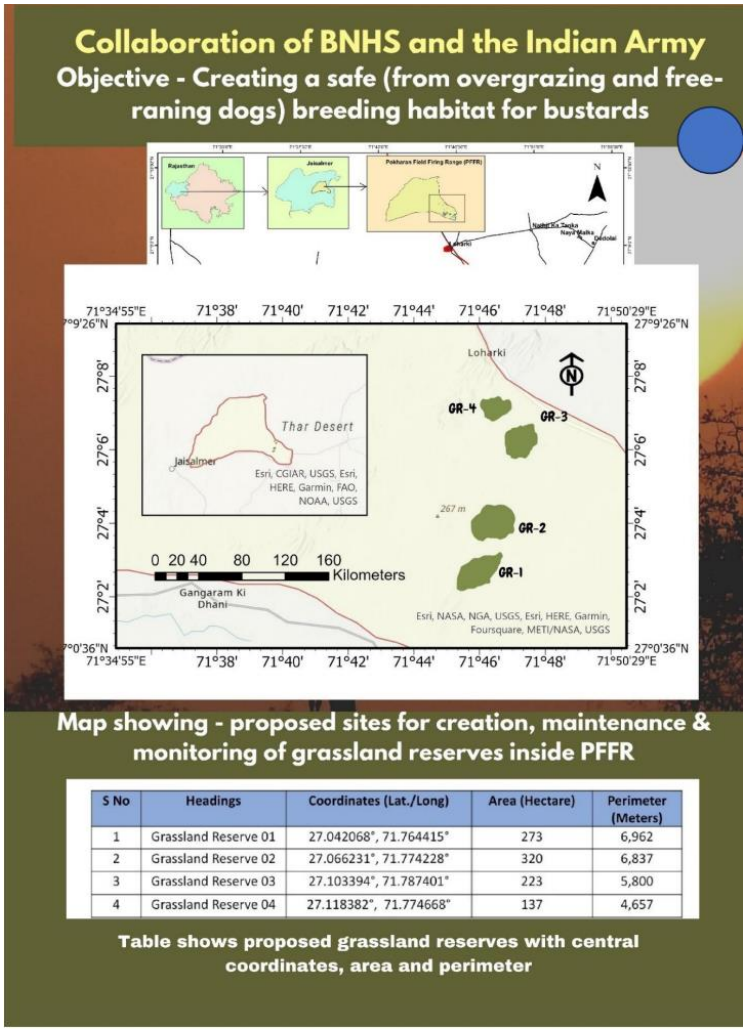


Image 08. Based on feedback from the students, a book about 99 species of Thar Desert in Hindi was published through an EIACP project supported by MoEF&CC

Image 09. A mother and juvenile freely roaming in a newly developed grassland reserve in Khetolai



S No	Headings	Coordinates (Lat./Long)	Area (Hectare)	Perimeter (Meters)
1	Grassland Reserve 01	27.042068°, 71.764415°	273	6,962
2	Grassland Reserve 02	27.066231°, 71.774228°	320	6,837
3	Grassland Reserve 03	27.103394°, 71.787401°	223	5,800
4	Grassland Reserve 04	27.118382°, 71.774668°	137	4,657

Figure 4: Map of PFFR along with proposed grassland reserve's area, perimeter, and coordinates

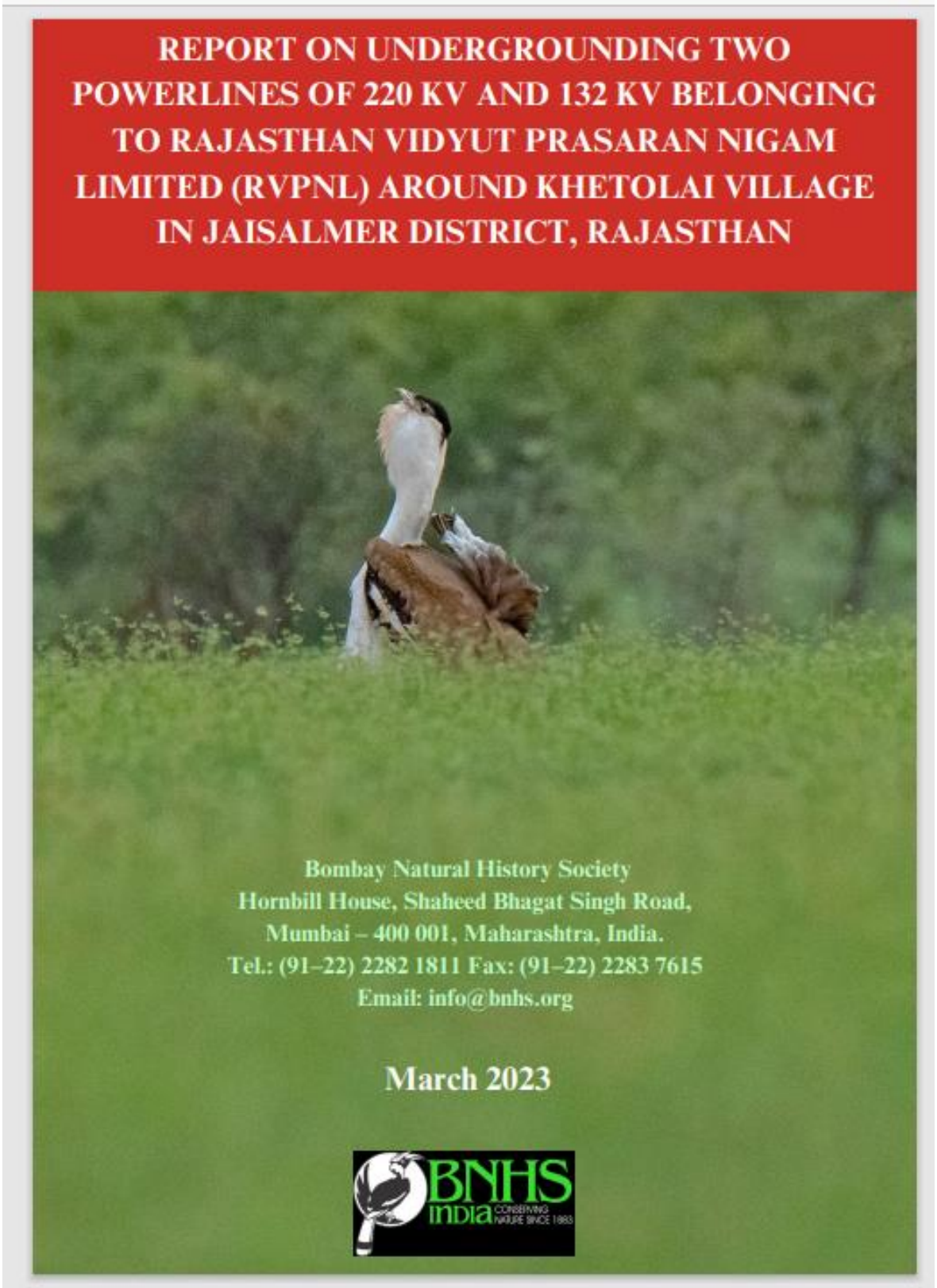


Figure 5 BNHS submitted a report on undergrounding two powerlines of 220 kv and 132 kv belonging to Rajasthan Vidyut Prasaran Nigam Limited (RVPNL) around Khetolai village in Jaisalmer district, Rajasthan. And following it up with the Government of Rajasthan rigorously

Journal of the Bombay Natural History Society, 120(1), Jan-Apr 2023 **90–100**

NOTES ON THREATENED RAPTORS SEEN DURING A LANDSCAPE SURVEY IN JAISALMER DISTRICT, THAR DESERT, RAJASTHAN[1]

NEELKANTH BORA[2,4], UNMESH MITRA[2,5], ANTHARGAM MOHAN[2,6], PANKAJ BISHNOI[2,7], MUSA KHAN[3] AND SUJIT SHIVAJI NARWADE[2,8,*]

[1]Accepted May 30, 2022
First published: March 31, 2023 | doi: 10.17087/jbnhs/2023/v120/164982
[2]Bombay Natural History Society, Hornbill House, Dr Sálim Ali Chowk, Shaheed Bhagat Singh Road, Mumbai 400 001, Maharashtra, India.
[3] S/O Bersi, Musalman Pada, Village Nimba, Gram Panchayat Bida, Jaisalmer 345 001, Rajasthan, India.
Email: guidemusakhan@gmail.com
[4]Email: n.bora@bnhs.org
[5]Email: unmesh.mitra008@gmail.com
[6]Email: mohansunstar2@gmail.com
[7]Email: p.bishnoi@bnhs.org
[8]Email: sujit.narwade@bnhs.org
*Corresponding author

New renewable energy projects are coming up rapidly in the Thar Desert of Rajasthan. From newspaper reports, the authors came to know about instances of mortality in birds. Therefore, a landscape survey was conducted across Jaisalmer district. The objective was to collect baseline information on raptors which can be utilised in future to assess the impact of the energy sector on the avifauna.
A total of 30 raptor species were recorded. Their distribution maps, relative abundance, and nesting records are provided in this paper. Out of the 30 species, three were Critically Endangered, two Endangered, and four Vulnerable, according to the IUCN (International Union for Conservation of Nature) RedList. Raptor congregations were found in comparatively safe, undisturbed parts of north-western and northern Jaisalmer, such as areas in control of the Border Security Force (BSF) and Indian Army, as well as in Desert National Park (DNP) and its surroundings.

Key words: Jaisalmer, Thar Desert, power lines, raptors, raptor mortality, vultures, eagles

INTRODUCTION

Raptors are classified into two main orders: the diurnal Falconiformes and the nocturnal Strigiformes. The Falconiformes are further divided into five families, i.e., Cathartidae, Pandionidae, Accipitridae, Sagittariidae, and Falconidae, of which Cathartidae and Sagittariidae are not found in India (Naoroji 2006). Being at the top of the food chain in their respective ecosystems, they are flagship species in biodiversity conservation schemes (Donázar *et al.* 2016). Collar *et al*. (1994) mentioned a massive decline in the population of White-rumped Vulture *Gyps bengalensis*, Indian Vulture *Gyps indicus*, Red-headed Vulture *Sarcogyps calvus*, and Cinereous Vulture *Aegypius monachus* in the world. A possible decline in vulture species in India was recorded during 1990–2000. In the year 1987 around 350 than 300 avian species are found in the Thar (Rahmani and Soni 1997). Of the 50 raptor species reported in Rajasthan, 34 species including resident, passage migrant, and wintering species, have been recorded in the desert region (Naoroji and Sangha 2013). Samant *et al.* (1995) sighted 19 species of raptors in Desert National Park (DNP) and surrounding areas during a survey in the 1990s, and found Egyptian Vulture *Neophron percnopterus* to be the most abundant, followed by Tawny Eagle *Aquila rapax*, and Kestrel *Falco* sp. Among the nine species of vultures found in India (Ali and Ripley 1987), seven have been recorded in the Thar Desert, of which four are resident species and breed here, whereas the remaining three species are winter migrants (Chhangani 2005; Chhangani and Mohnot 2004).

The Thar landscape lacks natural perches for birds, and the newly constructed pylons for transmission lines are often used

Figure 6 Scientific note on distribution of raptors in Thar Desert based on landscape surveys conducted by the GIB and LF team