Habitat improvement and conservation breeding of the Great Indian Bustard
An Integrated Approach

Progress Report
(April - August 2021)

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

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BUSTARD
RECOVERY PROGRAM

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Project title:	Habitat improvement and conservation breeding of the Great Indian Bustard: An Integrated Approach
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Implementation agencies:	(1) Wildlife Institute of India (2) Rajasthan Forest Department (3) Gujarat Forest Department
Collaborating agencies:	(1) International Fund for Houbara Conservation/Reneco (2) Bombay Natural History Society (3) The Corbett Foundation
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Project Habitat Improvement and Conservation Breeding of Great Indian Bustard of the Wildlife Institute of India

Progress Report (April – August 2021)

1. Introduction

The Great Indian Bustard *Ardeotis nigriceps* (hereafter GIB) is Critically Endangered and Schedule-I species with 100-150 individuals left. The population is now restricted largely in Jaisalmer (Rajasthan) and few individuals (<10) remaining in Kutch (Gujarat), Sholapur (Maharashtra), Ballari (Karnataka) and Kurnool (Andhra Pradesh). Over the last five decades, the species has suffered 90% reductions in number and range due to prevalent habitat loss and human induced mortalities compounded with its slow life history traits. The Ministry of Environment, Forest & Climate Change (MoEF&CC) formulated the National Bustard Recovery Plans in 2013 based on scientific consultation and initiated the Project "Habitat Improvement and Conservation Breeding of Great Indian Bustard" in 2016 with the Wildlife Institute of India (WII) as the nodal agency along with State Forest Departments and partner NGOs as collaborators to conserve the GIB and endangered Lesser Florican *Sypheotides indicus*. This project funded by National Compensatory Afforestation Fund Management and Planning Authority (CAMPA) Advisory Council (NCAC) aims at recovering GIB and Lesser Florican populations from extinction through holistic approach of conservation breeding, applied research, outreach and pilot habitat management. This report presents the project activities undertaken between April- August 2021.

2. Project objectives

2.1. Conservation Breeding
Developing and running Conservation Breeding Centre to secure ex situ populations of GIB and Lesser Florican as insurance against extinction and subsequent reintroduction/supplementation into restored habitats.

2.2. Applied research
Undertake targeted research to:
a) Prioritize conservation areas,
b) Characterize threats,
c) Monitor populations and habitats to assess the effectiveness of management actions,
d) Assess local communities' livelihood concerns and willingness to adopt bustard-friendly land uses
e) Comprehensive understanding of population genetics to inform conservation management

2.3. Capacity building and awareness
a) Improve protection enforcement through training of Forest Department staff and implementation of technology aided patrolling,
b) Sensitize decision-makers, managers and local communities on bustard conservation,
c) Raise public awareness and support for bustard conservation through awareness materials,
d) Incentivize local land users to adopt bustard-friendly land uses

2.4. Pilot implementations for surgical habitat management
Demonstrate best practices for habitat improvement through pilot/experimental surgical interventions that will be subsequently replicated by State Forest Departments.

3. Project Activities

3.1. Conservation Breeding

3.1.1. Conservation Breeding of GIB

Under the Conservation Breeding Program for Great Indian Bustard & Lesser Florican being implemented by the WII, in collaboration with RFD, MoEFCC, and IFHC - the global expert in bustard breeding, a pilot conservation breeding facility established at Sam in Jaisalmer District is currently housing a founder population of 18 Great Indian Bustard chicks of 1-26 months in age that have been artificially hatched from wild-collected eggs. The birds hatched in 2019 have achieved expected growth and development, and a few are showing behavioral signs of sexual maturity. There are 10 birds from the previous batch (2019-2020) that are being hand-reared and trained for transportation and assisted reproduction techniques. The facility has an in-house food production system for birds (invertebrate, vertebrate and crops), and is capable of running routine husbandry, veterinary interventions, surgeries and treatments for birds. A team of specially trained technicians from WII is raising them in captivity & developing the scientific husbandry approach for the species and their development and growth are satisfactory. Notably, female GIB in the wild were able to lay eggs multiple times within a season, indicating negligible impact of egg collection for conservation breeding on the viability of the in-situ population. A permanent facility is being developed at Ramdevra, Jaisalmer District that will be completed by the end of 2021 owing to the delay due COVID-19 restrictions, where the GIB will be reared for the long-term. The construction of the Conservation Breeding Facility at Sorsan, Baran District has been initiated.

3.1.2. Conservation Breeding of Lesser Florican

Two Lesser Florican chicks artificially incubated and hatched at the temporary Conservation Breeding facility for Lesser Florican in Bijainagar near Ajmer in Rajasthan during September 2020 from the eggs collected from agriculture fields near Shokaliya, Ajmer District and are growing well. The 11 month old chicks are being hand reared at the facility. The techniques and learnings from early stages of GIB conservation breeding program were successfully implemented with modifications for the LF pilot captive breeding venture. Nest search for collection of Lesser Florican eggs for conservation breeding commenced during July 2021 and is currently ongoing.

3.2. Applied Research

3.2.1. Tagging and tracking of GIB and Lesser Florican

To help in identifying intensively used areas by Great Indian Bustards that need highest protection & research-informed management, three (03) Great Indian Bustard females were tagged during April- July 2021. The birds were captured using nylon noose traps in foraging paths, nests and water guzzlers. The birds were fitted with solar powered GSM/GPRS backpack PTTs (E-obs and Microwave telemetry) using elastic harness material that weighed <1% of body weights. These tags are equipped with GPS and/or acceleration sensors and data is transmitted through mobile and internet networks. There was no apparent anomaly in their behavior or any mortality post tagging. Tracking of seven (07) GIB is being undertaken in Thar, Jaisalmer providing fresh insights into their phenology, ranging patterns, space use, seasonal habitat use, & critical resource (breeding, chick-rearing, foraging, roosting etc.) requirements that are directly informing conservation management.

Three (03) Lesser Florican males tagged near Ajmer during July-August 2021 is providing information on their seasonal movements, habitat use & climatic requirements. The birds were trapped with the help of

nylon noose traps laid in areas of agriculture field where they were likely to cross. Milsar S-9 GSM tags were fitted on the birds and released. The solar powered light weight tag, weighed ~3% of the bird's body weight and transmits locations via cellular network. The tags fitted on the bird has been providing information about its movement patterns and used locations. Habitat assessment of the areas used by the tagged birds are being carried out.

3.2.2. Bird mortality due to collision with wind mills

To assess bird mortalities caused due to wind turbines, bird carcass surveys are being carried out in Thar, Jaisalmer. Further, surveys are being conducted to examine bird crossing rates and use of wind turbine areas by birds and mammals. Bird carcass and crossing surveys at power-lines are being carried out to monitor power-line induced avian mortality and to assess the durability and effectiveness of bird diverters.

3.2.3. Habitat assessment and behaviour of GIB

Habitat assessment of nest sites and areas used by tagged birds are being carried out. Behavioural observations to understand the activity, foraging and breeding behavior of GIB were conducted in Thar during April- July 2021.

3.2.4. Dog population surveys

Surveys to enumerate dog population were carried out in and around Desert National Park to monitor the efficacy of the pilot dog sterilization conducted during 2019 and to plan the next the stage of sterilization.

3.2.5. Conservation genetics

Designing of microsatellites for parentage analysis and pedigree is being carried out with the help of genomic analysis. Molecular analysis is currently ongoing to identify the source population for conservation breeding of GIB. Additionally, sexing of the chicks born from the wild collected eggs in the current breeding season is being conducted.

3.3. Capacity building and awareness

3.3.1. Provided technical inputs to various agencies to implement power-line mitigation measures in priority/potential GIB areas across the species' range, in accordance with government regulations, through physical & online meetings.

3.3.2. Local community perception surveys were conducted in villages in Bikaner District to evaluate the presence and population trends of key wildlife species. Additionally, emerging threats to wildlife was also collected to identify conservation actions and priority areas.

3.3.3. Residents of local villages in and around Desert National Park were briefed about the on-going project activities. Final report of the GIB conservation project funded by Rajasthan State Pollution Control Board was prepared and disseminated to various stakeholders.

3.3.4. Scientific recommendations on habitat management based on site visit were shared with the Ballari circle of Karnataka Forest Department for conservation of GIB.

3.3.5. A review of the priority GIB area was carried out based on updated survey and telemetry data through consultation with Rajasthan Forest Department that resulted in identification of an Additional Important area outside the priority area that is vital for GIB conservation and connectivity between populations in the

Thar landscape, and the recommendation of undergrounding power-lines in the priority and additional important GIB areas.

3.3.6. Peer- reviewed publication in international journal (Biological Conservation) on impact of powerlines on bird species causing an estimated ~87,000 bird mortalities in Thar Desert, Jaisalmer highlighting the imminent risk of extinction to GIB due to power line mortality, and recommending urgent mitigation of overhead power cables with the avoidance of future overhead installations in bustard habitat.

3.3.7. Peer-reviewed publication in international journal (Endangered Species Research) on habitat selection of GIB to inform breeding habitat management.

3.3.8. Hon'ble Environment minister Shri. Bhupendra Yadav was briefed by the ADG (Wildlife)-MoEF&CC, Director- WII and Co-Principal Investigator of the GIB recovery project on the status and conservation of GIB during July 2021.

3.3.9. Capacity building workshop was organized for frontline staff of Rajasthan Forest Department in Jaisalmer and trained by Dr. Asad Rahmani.

3.3.10. Local volunteers and Rajasthan forest department staff in Bikaner District were trained in biodiversity assessment techniques.

3.3.11. The Hon. Supreme Court and NGT- Principal Bench orders on GIB conservation and implementation of threat mitigation measures cited the recommendations provided by the project team, and the implementation of these orders would greatly benefit the species' long-term conservation.

3.4. Pilot habitat management

3.4.1. Pesticide analysis

Pesticide sprayed/dead locusts collected from key GIB breeding enclosures (Ramdevra) to avoid poisoning of GIB and other bird/animal species, in collaboration with Rajasthan Forest Department and locust samples collected from GIB habitat in Thar are being analysed in the lab.

3.4.2. Identification of GIB habitats for conservation planning

To find suitable GIB habitats and to plan for future conservation (restoration / release etc.), mapping of grasslands in the country are currently being carried out.

3.4.3. Procurement of various bird diverters for pilot deployment in Thar

Bird diverters designed based on our technical inputs to local vendors for manufacturing indigenous low cost bird diverters were procured for distribution to power agencies for installation. Long-term studies are ongoing with installed diverters as a pilot step to examine their field longevity and efficacy since it requires many years and bird crossing/ collision events to detect the field life and effectiveness of these products in reducing crossings and/ or collisions.

3.4.4. Nest predator management

Trapping and translocation of GIB nest/ chick predators such as free-ranging dogs were carried out in prime breeding areas of Pokhran jointly by the WII and RFD.

3.4.5. Repairing of predator proof fence in GIB breeding enclosures

Predator-proof fence of GIB breeding enclosures in Suadasari inside Desert National Park were repaired twice during April-July 2021.