



Project
Great Indian Bustard
Annual Report 2024-25

Wildlife Institute of India
Bustard Recovery Program

Project Great Indian Bustard

Annual Updates 2024-2025

Project title: *Project Great Indian Bustard*

Project duration: *2024 - 2029*

Project report period: *July 2024 - March 2025*

Total budget: *50.95 crore INR*

5.47 crore INR (July 2024 - March 2025)

Project implemented by: *Wildlife Institute of India*

Partner agencies: *Ministry of Environment, Forest & Climate Change
Rajasthan Forest Department
International Fund for Houbara Conservation / Reneco*

Supported by: *National CAMPA (main funding)*

Suggested citation:

Dutta S, Karkaria T, Uddin M, Jangid AK, Kher V, Bishnoi V, Sonika CK, Upadhyay P, Gupta S, Paul I, Sharma H, Joshi H, Pati A, Nagar A, Lawrence S, Gupta T, Supakar S, Purohit N, Gurjar MK, Dagur T, Sindha P, Sen S, Gowda Y, Tanwar K, Bhonsle O, Moitra M, Kundu Y, Phinehas D, Sagar B, Dobhal P, Kapadi PR, Genwa SL, Singh J, Ram A, Chauhan KS, Prajapat CP, Kawlani L, Kolipakam V (2025). Project Great Indian Bustard: Annual Update Report 2024-25. Wildlife Institute of India, Dehradun.

Project team

Sh. Virendra R. Tiwari — Director, WII
Dr. Sutirtha Dutta — PI
Mr. Varun Kher, Dr. Vishnupriya Kolipakam, Dr. Lallianpui Kawlani — Co-PIs
Dr. Tushna Karkaria — Project Scientist
Dr. Vipul Bishnoi, Dr. Sonika CK & Dr. Pallavi Upadhyay — Project Veterinarians
Mr. Mohib Uddin & Mr. Ashish Kumar Jangid — Principal Project Associates
Ms. Hrishika Sharma, Ms. Hemlata Joshi, Ms. Shimontika Gupta, Ms. Anjali Nagar, Mr. Anshuman Pati, Mr. Sourav Supakar, Mr. Indranil Paul, Ms. Swapna Lawrence, Ms. Nikhila Purohit, & Ms. Tanya Gupta — Senior Project Associates
Mr. Mahesh Kumar Gujjar & Ms. Tanisha Dagur — Project Associate II
Mr. Yashwanth Gowda NM, Ms. Kajal Tanwar, Ms. Swati Sen, Ms. Mayuri Moitra, & Mr. Osho Bhonsle — Project Associate I
Mr. Priyank R Kapadi, Mr. Sohan Lal Genwa, & Ms. Maithili Sawant — Project Assistant
Mr. Jog Singh, Mr. Amrit Ram, Mr. Chandraprakash Prajapat & Mr. Kuldeep Singh Chauhan — Field Worker
Ms. Binya Sagar & Mr. Pradeep Dobhal — Office Assistants (Project Associate I)
Dr. Shashikant Jadhav (Consultant)

Collaborating officers

CWLW, Rajasthan
DCF, Jaisalmer
DCF, Ajmer
Dr. Frederic Lacroix, CEO Reneco (IFHC)
Dr. Lesobre Loic, Scientist Reneco (IFHC)

Advisors

Dr. Yadvendradev Jhala, Sh. Qamar Qureshi, Dr. G. S. Bharadwaj (MS NTCA), & Dr. Asad Rahmani

Project interns, volunteers & msc students

Ms. Pavithra Sundar, Mr. Krishna Singh Jani, Mr. Swayam Thakkar, Ms. Shachi Pandey, Ms. V. Priyadarshini, Ms. Aparajita Som, Mr. Gokul Vivek, Mr. Chirag Vassa, Ms. Ananya Singh, Mr. Manas Shukla

Collaborating Researchers

Ms. Tanya Gupta, Mr. Pradhumansinh Sindha, Mr. Yudhajit Kundu, Ms. Mayuri Moitra, Mr. David Phinehas

Support staff

Mr. Aamin Mehar, Mr. Ankit Kumar, Mr. Aradin Khan, Mr. Arsad, Mr. Arsad Khan, Mr. Bagal Khan, Mr. Bhagchand Bairwa, Mr. Bhanwar Lal, Mr. Bhawani Singh Solanki, Mr. Chandan Prajapat, Mr. Chanesar Khan, Mr. Deepak Prajapat, Mr. Deravar Ram, Mr. Dhanraj Mali, Mr. Farukh, Mr. Gordhan Kumar, Mr. Govardhan Mali, Mr. Harish Ram, Mr. Haru Ram, Mr. Imran, Mr. Jabbar, Mr. Jagdish, Mr. Jamaldin, Ms. Jamni Devi, Mr. Jeevraj, Mr. Jhabraram, Mr. Jubair, Mr. Kamal Kishor, Mr. Kamal Ram, Mr. Kamlesh, Mr. Keshab KC, Mr. Kularam, Mr. Kurban Khan, Mr. Lalu Ram, Mr. Lokesh Kumar, Mr. Mohammad Anwar, Mr. Mohammed Anwar, Mr. Mohammed Shabeer, Mr. Mukesh Bairwa, Mr. Mukesh Kumar, Mr. Musa Khan, Mr. Navla Ram, Mr. Nema Ram, Mr. Om Prakash, Mr. Parsaram Meena, Mr. Prakash, Mr. Purushottam Kumhar, Mr. Rahamat Ulla, Mr. Rahim Khan, Mr. Rahman Khan, Mr. Raja, Mr. Rajesh Kumar Prajapat, Mr. Rajesk Kumar, Mr. Ramjan, Mr. Rasid Khan, Ms. Rekha Mali, Mr. Saale Khan, Mr. Saddam Hussain, Mr. Saddam Khan, Mr. Sahil Khan, Mr. Sanvala Ram, Mr. Savan Khan, Mr. Shabir Khan, Mr. Sharwan Kumar, Mr. Sher Mohammad, Mr. Subash Chandra Basnet, Mr. Tiku Ram, Mr. Vinod Mali, Mr. Vishnu Datt, Mr. Vivekanand

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Background

The Great Indian Bustard (*Ardeotis nigriceps*) and Lesser Florican (*Sypheotides indicus*) remain among the most Critically Endangered bird species globally, with estimated populations of approximately 140 and 800 individuals, respectively. Recovery efforts for these flagship species are vital not only for their survival but also for preserving the broader biodiversity of arid and semi-arid open natural ecosystems (ONEs) in India.

Recognising the urgent need for coordinated action, the Ministry of Environment, Forest and Climate Change (MoEF&CC), in consultation with scientific experts and field managers, formulated the National Bustard Recovery Guidelines in 2013. Based on these guidelines, conservation measures were initiated in 2016, leading to the establishment of a conservation breeding program, initial habitat restoration interventions, and other key activities across the bustard range.

Building upon these early efforts, the National Action Plan for the Conservation of Great Indian Bustard and Lesser Florican was developed to advance and consolidate conservation actions under the Project Great Indian Bustard. This project is structured into two components:

Part A: Conservation breeding and scientific inputs for *in-situ* management, implemented by the Wildlife Institute of India (WII) in collaboration with the Rajasthan State Forest Department.

Part B: Habitat restoration, community engagement, and outreach activities, implemented by Rajasthan Forest Department and other bustard range states, with technical inputs from WII.

The project is envisioned as a long-term initiative, with an initial implementation period of at least 10 years. Funding support for the first phase (July 2024 to March 2029) has been sanctioned by the Governing Body of National CAMPA. The project activities formally commenced in July 2024. This annual update report provides a summary of the major actions undertaken during the reporting period (July 2024 to March 2025).

Conservation Breeding

Great Indian Bustard

The Project Great Indian Bustard is operating two conservation breeding centres for the Great Indian Bustard (GIB), located at Sam and Ramdevra in Jaisalmer district, Rajasthan, and one facility for the Lesser Florican (LF) at Arwar in Ajmer district, Rajasthan. These centres were developed based on founder stocks secured from wild-laid eggs in the previous Project. During the reporting period, significant advancements have been made in infrastructure development, bird management, and captive breeding.

Infrastructure Development and Upgradation

Sam Conservation Breeding Centre

This facility was originally upgraded from a pre-existing forest *chowki* in 2019. Later, it underwent major renovation in October 2024 to support an expanding captive population. Key developments included:

- Construction of an additional birdcage adjacent to existing enclosures to accommodate more adult birds (Plate 1).
- Creation of a new indoor juvenile rearing room to house chicks before their transfer to the Ramdevra facility.
- Establishment of a dedicated washing and sanitation room, replacing the prefabricated structure.

Ramdevra Conservation Breeding Centre

The Ramdevra Conservation Breeding Facility has been operational since 2022, and the infrastructure here is being scaled up with:

- Development of a new large bird enclosure capable of housing >20 birds.
- Procurement of two indoor holding units for housing birds at night.
- Construction of a rewilding aviary, funded by the Rajasthan Forest Department, to facilitate pre-release training of birds.

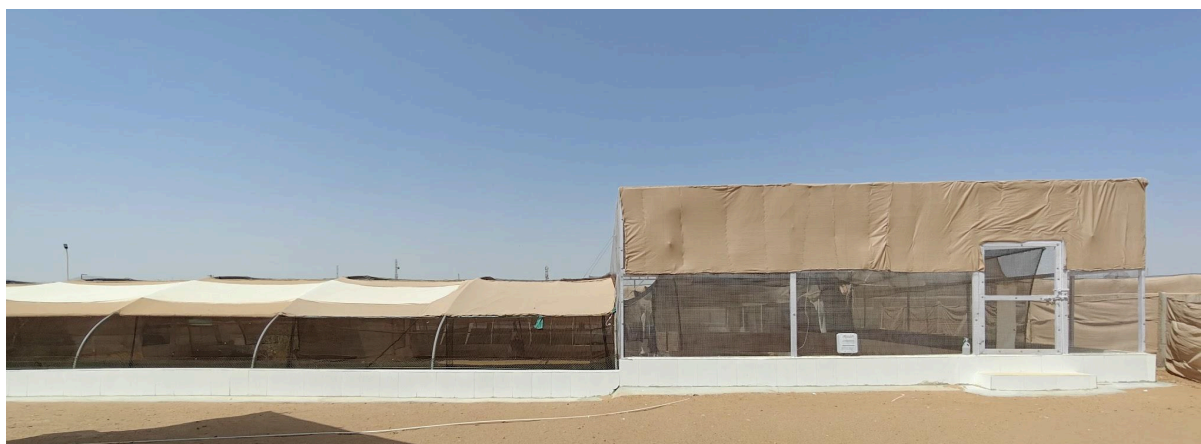


Plate 1. The modified bird cage adjacent to the existing tunnel in Sam Conservation Breeding Centre, Jaisalmer

Captive Bird Population Status

As of March 2025, a total of 53 Great Indian Bustards are housed in the National Bustard Conservation Breeding Centres at Sam and Ramdevra (Table 1). The cohort distribution by year and location is detailed below:

Table 1. Year-wise and site-wise population of captive GIB housed at the National Bustard Conservation Breeding Centre, Jaisalmer

	Chick	Female > 1 yr		Male > 1 yr		Total
Cohort		Ramdevra	Sam	Ramdevra	Sam	
2019			5			5
2020			3		1	4
2021			2			2
2022		3		5		8
2023		3		2	3	8
2024		7	1	8	1	17
2025	9					9
Total	9	13	11	15	5	53

*as on 31.03.2025 below the table

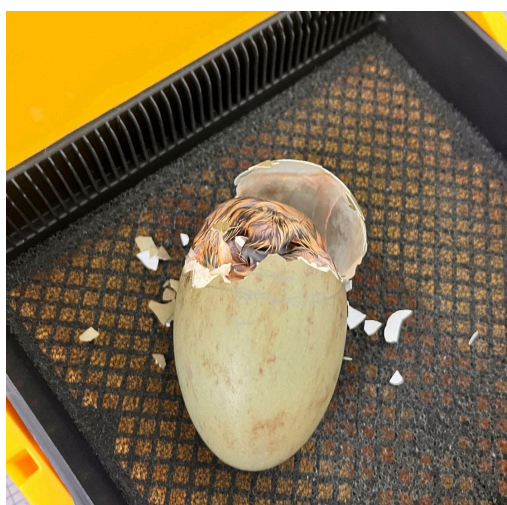


Plate 2. GIB egg hatching at National Bustard Conservation Breeding Centre, Jaisalmer (left); Plate 3. Newly hatched GIB chicks in the brooder at the National Bustard Conservation Breeding Centre, Jaisalmer (right)

Breeding Progress

- During the reporting period, 19 chicks were successfully hatched, which includes 16 chicks from eggs laid in captivity through natural mating (14 chicks) and artificial insemination (two chicks), while the remaining three chicks were hatched from wild-laid eggs.
- Ten females over the age of two years are showing signs of fertility, and six have produced chicks so far.

- Six males over the age of two years are showing signs of breeding, and four have sired chicks (Plate 4).
- Seven males are being trained for semen collection on female decoys, of which two are producing semen that has been used for artificial insemination (Plate 5).
- Semen analysis and cryopreservation are ongoing to store the collected semen samples.



Plate 4. Displaying male in the National Bustard Conservation Breeding Centre, Jaisalmer (left); Plate 5. Decoy training of male GIB for semen collection (right)

Lesser Florican

Infrastructure Development and Upgradation

In July 2024, the Lesser Florican Breeding Centre was successfully relocated from a rented property in Bijainagar to the Forest *chowki* in Arwar, Rajasthan. The new centre has been made fully functional and equipped with one outdoor bird housing unit with 12 bird cages, a chick-rearing unit, an incubation room, and a veterinary unit (Plates 6 & 7).



Plate 6. The new bird housing unit at the Lesser Florican Conservation Centre in Arwar chowki, Ajmer (left); Plate 7. Incubation, rearing and veterinary unit at Arwar (right)

Captive Bird Population Status

A total of 12 birds (six males and six females) are currently housed at the Lesser Florican Breeding Centre at Arwar (Table 2). Each bird is housed in an individual cage within the outdoor unit, which is setup to facilitate monitoring and minimise stress. During the last breeding season (August–September 2024), four wild-collected eggs were hatched at the conservation breeding facility. These eggs were collected from Bandanwara and Dhantol villages. Of these, three were males and one was a female.



Plate 8. Lesser Florican chicks in the exercise cage in CBC, Arwar (left); Plate 9. Decoy training of a male lesser florican for semen collection (right)

Table 2. Year-wise and site-wise population of captive lesser floricans housed at the Lesser Florican Conservation Breeding Centre, Arwar, Ajmer

Cohort	Female	Male	Total
2020	1	0	1
2022	1	1	2
2023	3	2	5
2024	1	3	4
Total	6	6	12

*as on 31.03.2025 below the table

Breeding Progress

In a promising step, a male florican from the 2023 cohort began exhibiting courtship behaviour from February 2025. The bird also transitioned into a full breeding plumage that is commonly observed in wild breeding males. Alongside these changes, the bird started its characteristic breeding display with jumps of approximately 4-5 feet accompanied by a sharp wing-emitted sonation. The frequency of these display jumps increased gradually, from 30

jumps per day during the first 10 days to 120 jumps per day by the third week after he began displaying.

From the second week of March, the bird was trained for semen collection using a female decoy. This training was carried out twice a week and led to successful semen collection in late March. The semen volumes ranged from 20 to 30 microliters, and each sample was evaluated for sperm concentration and motility. A semen cryopreservation facility is currently being set up at the Arwar Conservation Breeding Centre to enable future sperm storage and artificial insemination efforts.

Outcomes

The conservation breeding component has made remarkable progress, especially for the Great Indian Bustard. By securing the captive-reared stock, total extinction has been abated, and surplus captive-bred birds can be released into restored habitats in the near future. The production of captive-bred GIB chicks has exceeded expectations, with 16 chicks produced after June 2024 against a preliminary expectation of 3-5 chicks in the first year.

Scientific inputs in habitat restoration

Great Indian Bustard

Since July 2024, several field-based ecological research activities have been conducted to support the habitat restoration component under Project Great Indian Bustard.

In October 2024, a large-scale population survey for the Great Indian Bustard was conducted across approximately 13,000 km² of the Thar landscape in Jaisalmer, which holds the only viable wild population of the species. A seasonal repeat of the survey is planned to be conducted in summer 2025, and the necessary preparations for the same have been completed. In addition to the large-scale survey, regular monitoring of the GIB population was carried out in and around Desert National Park (DNP) to assess population status, life-history parameters, seasonal space use and behavioural patterns. Two female GIBs, tagged with transmitters during the precursor phase of the project, continued to be tracked on ground to gather detailed movement and habitat use information.

Habitat characterisation and quantification of food availability, particularly insects, were undertaken in and around DNP to inform habitat management actions. Concurrently, other co-occurring taxa and their response to GIB conservation activities (particularly enclosure creation) were monitored using appropriate methods - avifauna using line transects and mist-netting, raptors using vehicle surveys, grasshoppers through sweep-netting, Chinkara through line transects and meso-carnivores through camera trapping.

In the field, targeted predator management actions were implemented in collaboration with the Rajasthan Forest Department. As part of this initiative, six mammalian predators were captured from the key GIB breeding enclosure of DNP and translocated into other enclosed habitats in and around DNP. This activity aimed at reducing the nest predation pressure on GIB in certain key enclosures and improving the currently low hatching success (~37%), attributed largely to egg predation.

Further, extensive free-ranging dog management was carried out in the Pokhran area, involving the sterilisation (spay-neuter) of 560 individuals and the translocation of approximately 100 animals from critical GIB breeding habitats. Dog population monitoring was also initiated in targeted villages to evaluate the coverage and effectiveness of these interventions. To inform efforts targeted at the mitigation of power infrastructure, systematic surveys of power lines were conducted to assess the mortality rates under different power lines and the effectiveness of Bird Flight Diverters installed by power agencies in the GIB Priority Area.

Monitoring of GIB populations

Demographic Monitoring

In 2024, 15 nests were detected in the wild, of which 13 were in DNP and two in Ramdevra. Three eggs (two from tagged birds and one from Ramdevra EF) were collected for the Conservation Breeding Centre, and all of them hatched successfully. Nine nests were monitored in the wild, of which six hatched, two were predated, and the fate of one could not

be determined. Jump-start / egg-swapping was attempted with three nests, of which two were successful. All the wild eggs found in 2024 were checked for fertility and were found to be fertile.

Two tagged birds, 5949 and 8649, were monitored over the breeding season. Bird 5949 nested twice, while 8649 nested four times. One egg from both of these birds was collected for the conservation breeding program. Of the four nests left in the wild, only one got predated. The inter-clutch interval for these two birds was between 1 and 1.5 months.

The breeding season was recorded from March to August, with sporadic male displays starting in early March. Four display sites were identified in the Sudasari ACD enclosure, and one in the PPC Chauhani enclosure. Sporadic displays were seen in the RKVY cluster, Gajaimata enclosure, and other enclosed areas of the Sudasari cluster. The nesting activity showed two breeding peaks, one in April and another in June-July.

A chick recruitment survey was conducted for three days between 28th November and 1st December in four teams. Polygons were laid over previously recorded breeding and wintering grounds used by GIB, and vehicle transects were laid on pre-existing trails in each polygon. Additionally, one or more vantage points at strategic locations were chosen in each polygon. Thus, a combination of vehicle surveys and stationary surveys was conducted. Information on sightings, such as location, flock size, age, and sex of the chick, was recorded. This way, ~208 km of vehicle transects were surveyed in DNP and Salkha-Kuchhri grasslands north of DNP. In total, 13 females, 5 males, and 5 chicks were sighted. Thus, the naive recruitment rate (chick: female ratio) for 2024 was found to be 0.38 chicks/female.

Population Surveys

The Landscape Survey to assess population status, habitat conditions, and threats to GIB and its associated species in the Thar landscape of Jaisalmer, Rajasthan, was conducted from 15th to 30th October 2024. This landscape is the last stronghold for the GIB, which serves as a flagship for arid ecosystem conservation. Following a gap in data since 2018, the survey was conducted to re-establish baselines using the same methods employed in earlier surveys conducted during 2014–18. The survey was carried out jointly by WII and the Rajasthan Forest Department, covering an area of approximately 20,000 km². The area was divided into 96 12×12 km grid cells across seven blocks—Ramdevra, Rasla, Pokhran Field Firing Range (PFFR), Mohangarh, Ramgarh, Sam, and Myajlar (Fig. 1). In the PFFR and Sam blocks, grids were further classified as core and buffer based on habitat protection status. Surveys were conducted in 86 grids using vehicle-based Distance and Occupancy sampling. Each team of three observers covered 20–30 km transects during peak activity periods (*i.e.*, morning from 06:00 to 10:00 and evening from 16:00 to 18:30), collecting data via *Locus Map* and *Epicollect5* mobile applications.

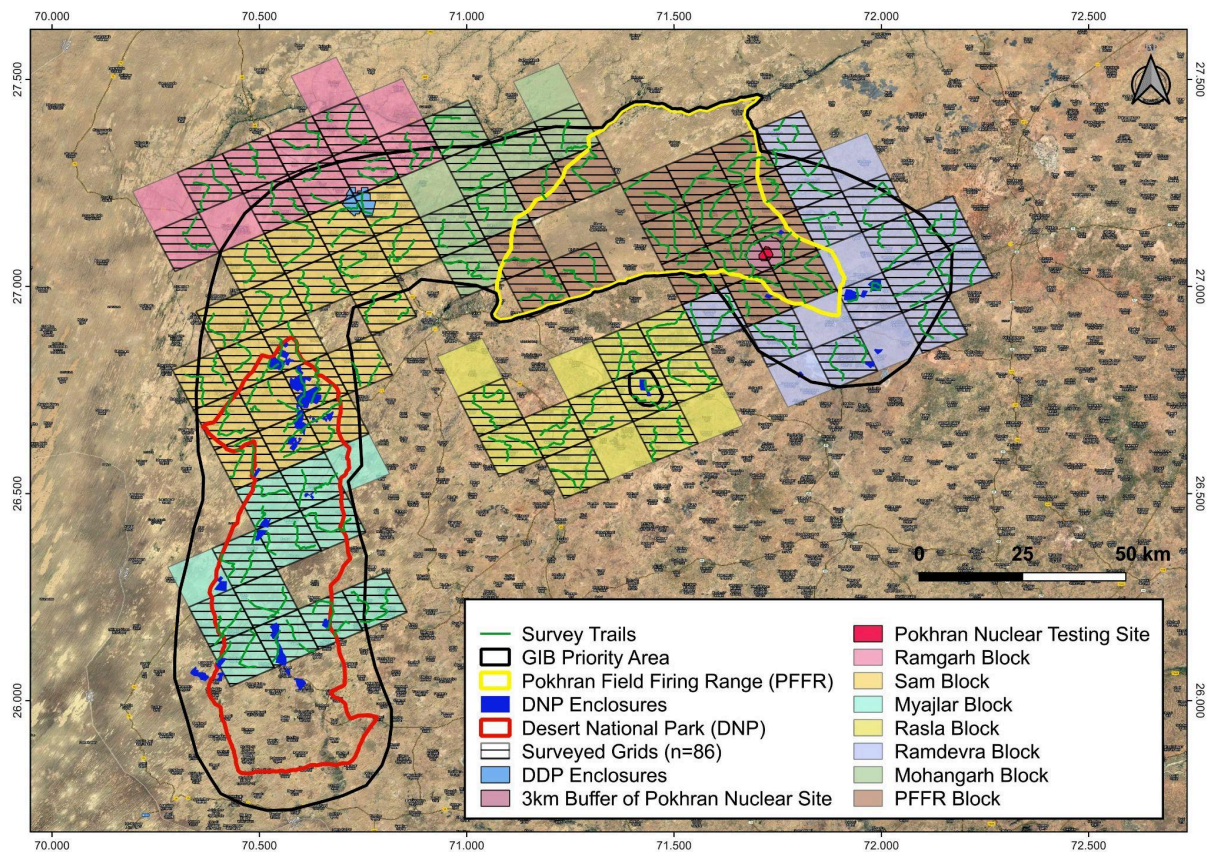


Figure 1. Map showing the survey framework along with the surveyed trails with respect to blocks in Jaisalmer

The survey recorded a total of 1,913 km of transects, yielding 34 GIB sightings, highest in the PFFR core zone (13 sightings), followed by Sam (9) and Ramdevra (2) (Fig. 2). These observations reaffirm that PFFR and DNP (Sam) remain the most critical grassland habitats, especially areas with minimal anthropogenic disturbance, such as near the Nuclear Site and Target Wall (PFFR) and Ganga–Sudasari enclosures (Sam) (Plates 10 & 11). While GIB presence was restricted to core areas, suitable habitats were observed across a wider area, particularly in low-disturbance sites where raptors, chinkara, and other grassland specialists were also recorded (Fig. 2).



Plate 10. Extensive grassland habitats in Pokhran Field Firing Range, Jaisalmer (left); Plate 11. Protected grassland habitats in Desert National Park, Jaisalmer (right)

Co-occurring species showed varied distribution: chinkara occupied 75% of the grids (1.65 individuals/km encounter rate), nilgai 41% (0.19/km), desert fox 28% (0.02/km), and Egyptian vultures were recorded in 76% of the grids. Dogs were detected across 76% of the survey area, highlighting their pervasive presence. Species like the Indian fox and desert cat had low detection frequencies. Block-wise occupancy estimates showed GIB presence mainly in PFFR (0.85±0.44), Sam (0.5) and Ramdevra (0.32), with negligible presence in other blocks. Raptors such as Egyptian vultures and Laggar falcons had widespread occupancy, especially in undisturbed grasslands.

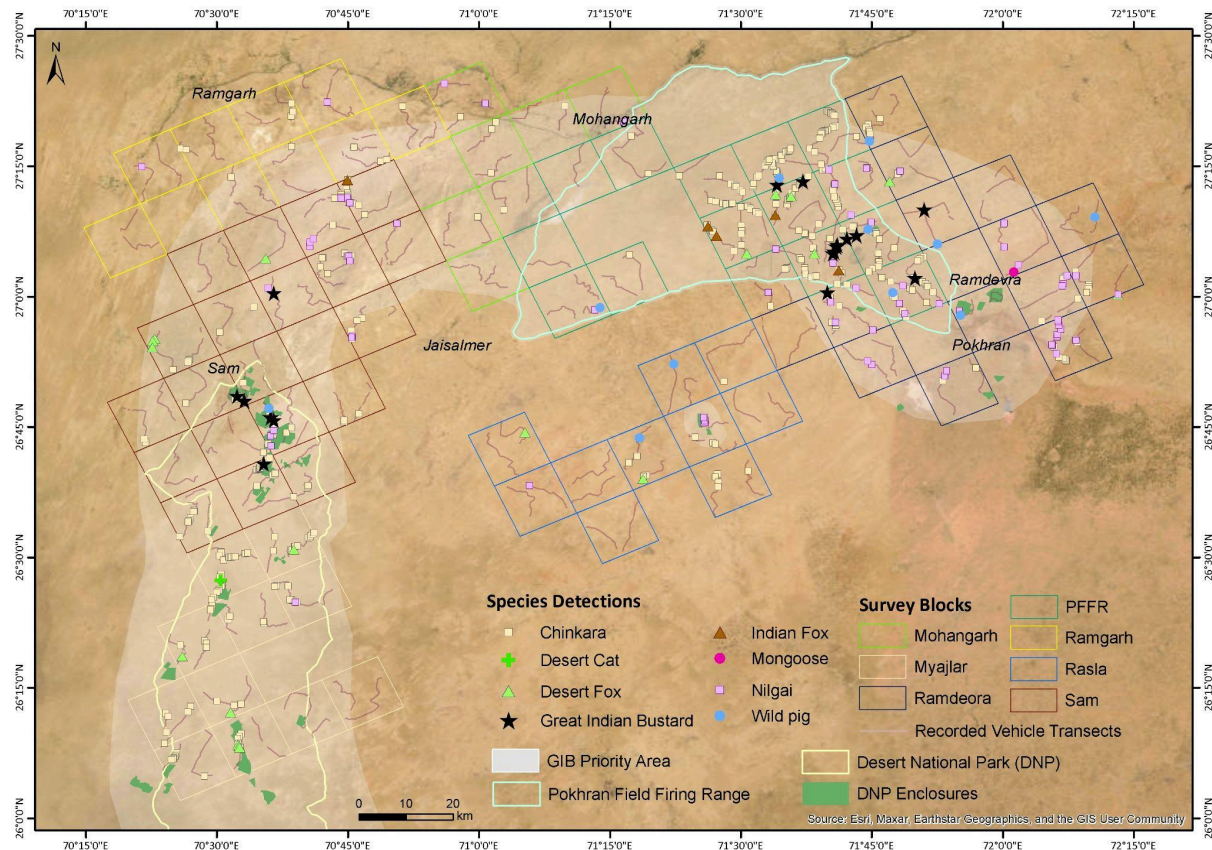


Figure 2. Detection locations of Great Indian Bustard and associated mammals during landscape survey in Jaisalmer, October 2024

Habitat variables were recorded systematically at 2 km intervals, including land cover type, terrain, substrate, vegetation structure, burrow presence (Indian Jird and Spiny-tailed Lizard), and anthropogenic elements such as roads, windmills, solar installations, and human settlements. While this assessment establishes key insights into species distributions and habitat conditions, the single-season nature of the survey limits the precision of estimates for less-detected species. A follow-up survey is planned to be conducted in the summer of 2025 with the objective of collecting multi-seasonal information and refining the density estimates using advanced distance sampling.

Telemetry and Ranging

Between 2019 and 2025, a total of 10 GIB females have been tagged with GSM/GPRS PTTS (Argos PTT 70g, e-obs telemetry 42g, Bird Solar tags, and 50g Movetech Flyway-50 tag). These tags have an advertised lifespan of 2–3 years, and the e-obs tags deployed on

GIB have, on average, transmitted for 24.7 months after deployment. One tag has functioned for 60 months since the time of deployment. Currently, no GIB tags are functional. Information from tagged females, such as habitat and space use patterns and behavioural data from accelerometers, has provided valuable ecological and conservation information on this Critically Endangered species. All this information has been reported in previous reports and the final report of the precursor project “Habitat improvement and conservation breeding of the Great Indian Bustard”.

Ecological Monitoring

Habitat Monitoring

A habitat assessment survey in the GIB ranging area is done for the monsoon and winter seasons. The survey was done in 60 grids of 1 km² grid frame during the monsoon and 99 grids in winter. Two transects of 200 m were walked in each grid, and 9 quadrats of 2×2m were laid within each transect for collecting data on ground vegetation composition and structure. Land cover, terrain, and substrate, along with disturbances caused by human infrastructure and activities within a radius of 200m, were noted.

Out of 52 species of herbs and shrubs recorded during monsoon, *Dactyloctenium aegyptium* was found to be the most dominant species (43% occurrence), followed by *Cyamopsis tetragonoloba* (39%), *Indigofera cordifolia* (33%), *Aristida depressa* (25%), and *Cenchrus biflorus* (24%) (Fig. 3). A total of 58 species were recorded during winter. *Indigofera cordifolia* was the most dominant species (35% occurrence). *Dactyloctenium aegyptium* (34%), *Aristida depressa* (25%), *Crotalaria burhia* (23%), *Cenchrus biflorus* (22%), and *Fagonia cretica* (22%) are the other dominant species found during winter (Fig. 4).

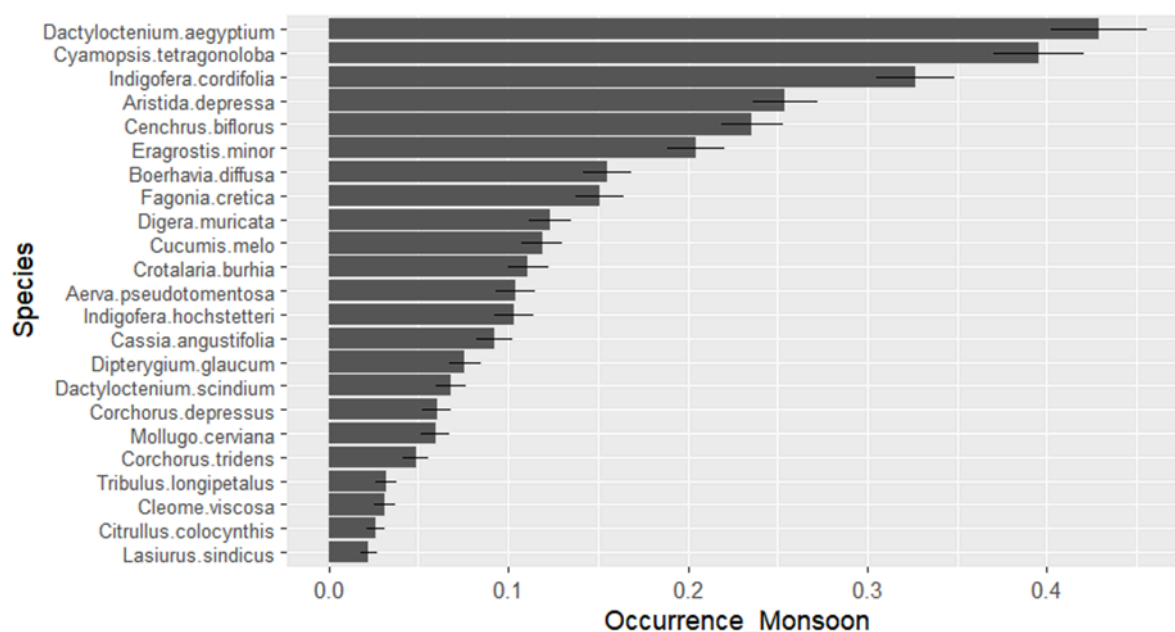


Figure 3: Vegetation occurrence in the monsoon season

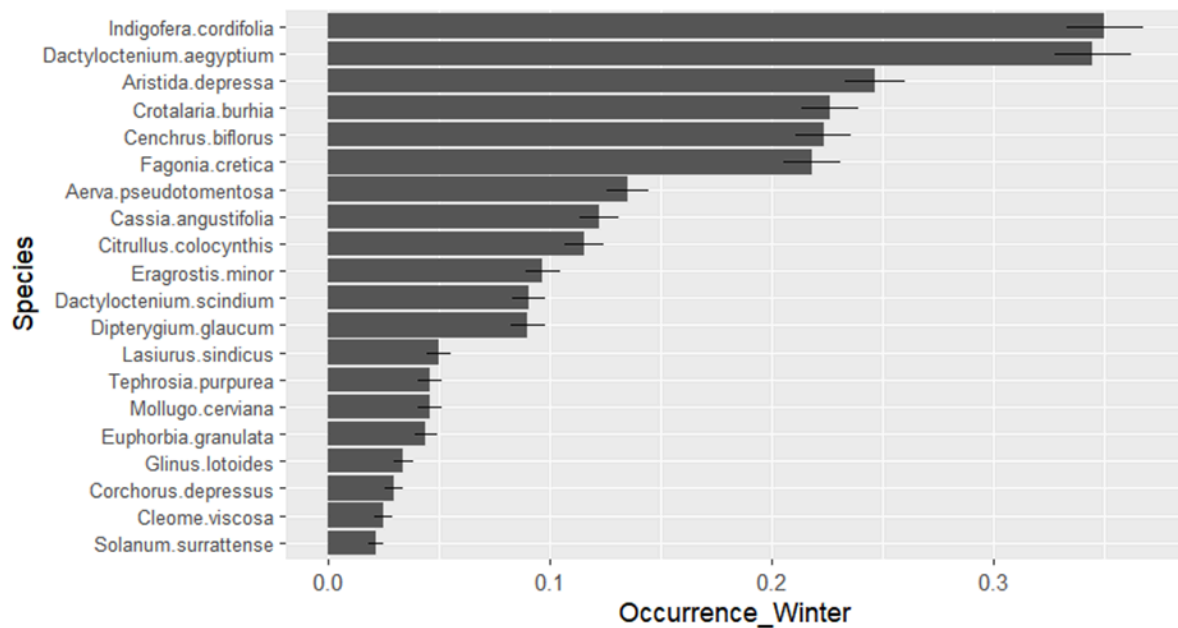


Figure 4: Vegetation occurrence in the winter season

Insect Fauna

An orthopteran diversity assessment was conducted in various protected enclosures and adjoining non-protected agro-pastoral areas within DNP. The survey enclosures ranged from 3 to 12 km² in size. Sampling was carried out in a 50 x 4 m² belt transect using the sweep net method at random points across the study areas (across 153 grids of 1 km²). From each sampling location, four adult individuals of each species, representing different sexes, were collected and preserved for taxonomic identification. The primary aim was to document the diversity and distribution of Orthoptera species across different land-use types.

A total of 24 species from 5 families, 11 subfamilies, 20 genera, and 4 subgenera (Table 3) were recorded during the surveys. The landscape is largely dominated by grass species, such as *Dactyloctenium aegyptium*, *D. scindicum*, *Aristida depressa*, *Cenchrus biflorus*, and *Lasiurus indicus*. Shrub species, such as *Aerva pseudotomentosa*, *Crotalaria burhia*, *Dipterygium glaucum*, and *Fagonia cretica*, also contribute to habitat heterogeneity. Specimens were recorded across various land cover classes, with grasslands contributing a notable share to overall species richness, which highlights the ecological significance of orthopteran species communities in arid environments.

Table 3. Orthopteran species observed in and around Desert National Park, Jaisalmer

Family	Sub-family	Genera	Sub-genus	Species	Habitat
Acrididae	Acridinae	<i>Truxalis</i>		<i>Truxalis indica</i> (Bolívar, 1902)	Grassland, Scrubland
	Calliptaminae	<i>Acorypha</i>		<i>Acorypha glaucopsis</i> (Walker, 1870)	Grassland
	Cyrtacanthacridinae	<i>Schistocerca</i>		<i>Schistocerca gregaria</i> (Forskål, 1775)	Agriculture land, Grassland
		<i>Anacridium</i>		<i>Anacridium rubrispinum</i> Bey-Bienko, 1948	Grassland, Scrubland

	Eyprepocnemidinae	<i>Heteracris</i>		<i>Heteracris littoralis</i> (Rambur, 1838)	Scrubland
	Gomphocerinae	<i>Cruciotacris</i>		<i>Cruciotacris decisa</i> (Walker, 1871)	Grassland
		<i>Leva</i>		<i>Leva indica</i> (Bolívar, 1902)	Grassland
		<i>Ochrilidia</i>		<i>Ochrilidia geniculata</i> (Bolívar, 1913)	Grassland
				<i>Ochrilidia gracilis</i> (Krauss, 1902)	Grassland
				<i>Ochrilidia hebetata</i> (Uvarov, 1926)	Grassland
	Oedopodinae	<i>Acrotylus</i>		<i>Acrotylus humbertianus</i> Saussure, 1884	Grassland
				<i>Acrotylus longipes</i> (Charpentier, 1845)	Scrubland, Grassland, Agriculture land
		<i>Oedaleus</i>		<i>Oedaleus senegalensis</i> (Krauss, 1877)	Scrubland, Grassland
		<i>Scintharista</i>		<i>Scintharista notabilis</i> (Walker, 1870)	Barren land
		<i>Sphingonotus</i>	<i>Neosphingonotus</i>	<i>Sphingonotus (Neosphingonotus) paradoxus</i> Bey-Bienko, 1948	Barren land
			<i>Sphingonotus</i>	<i>Sphingonotus rubescens</i> (Walker, 1870)	Barren land
	Catantopinae	<i>Diabolocatantops</i>		<i>Diabolocatantops pinguis</i> (Stål, 1861)	Scrubland
Pyrgomorphidae	Pyrgomorphae	<i>Chrotogonus</i>	<i>Chrotogonus</i>	<i>Chrotogonus (Chrotogonus) trachypterus</i> (Blanchard, 1836)	Barren land
		<i>Poekilocerus</i>		<i>Poekilocerus pictus</i> (Fabricius, 1775)	Scrubland
		<i>Pyrgomorpha</i>	<i>Pyrgomorpha</i>	<i>Pyrgomorpha (Pyrgomorpha) bispinosa</i> Walker, 1870	Agriculture land
				<i>Pyrgomorpha (Pyrgomorpha) conica</i> (Olivier, 1791)	Agriculture land
		<i>Tenuitarsus</i>		<i>Tenuitarsus orientalis</i> Kevan, 1959	Barren land
Tetrigidae	Tetriginae	<i>Paratettix</i> Bolívar, 1887		sp.	Grassland
Schizodactylidae	Schizodactylinae	<i>Schizodactylus</i>		<i>Schizodactylus monstrosus</i> (Drury, 1773)	Barren land
Tettigoniidae	Conocephalinae	<i>Euconocephalus</i>		<i>Euconocephalus incertus</i> (Walker, 1869)	Grassland

Bird Monitoring

To monitor small bird populations in the Thar landscape, the field team conducts annual line transect surveys and mist netting. Bird monitoring is essential for understanding species trends, which can inform conservation and management decisions. Through long-term mist netting, we will be able to monitor bird health and demographic parameters of birds such as body condition and survival rates.

Line transects

Grids of size 1 sq km were overlaid across the sampling area, and four straight line transects of 500 m each were walked within every grid (Fig. 5)). Surveys were conducted after sunrise (between 0600-1000 hrs) and before sunset (between 1700-1900 hrs), when bird activity is usually highest.

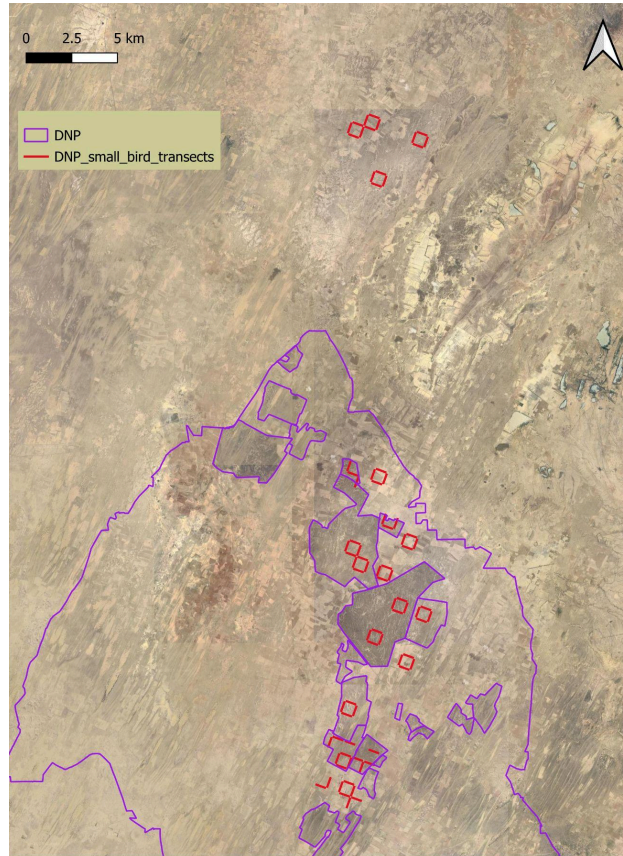


Figure 5. Study area and transects walked for population estimation of small birds in DNP and Salkha grasslands

A total of 17 (2 km each) transects were walked during January and February 2025. Of these, 10 transects were inside DNP enclosures, and 11 transects were outside enclosures (Fig. 5). In total, 64 species were observed, of which 45 species were detected inside enclosures and 51 outside enclosures. The overall species richness was higher outside enclosures, due to the presence of more habitat classes outside as compared to only the grasslands inside. However, further analysis will be refined by accounting for individual detection probability.

Mist netting

Between six and 10 mist nets (mesh size 16 mm and length 6–12 m) were set up at appropriate locations within DNP enclosures. Nets were deployed for two to three hours after sunrise and two hours before sunset, during periods when the temperature was neither too hot nor too cold. The nets were tied to poles and anchored using rocks.

Birds caught in the nets were first disentangled, placed into cloth bags, and brought into the shade. Morphological measurements were recorded, and key phenological features such as

moulting and presence of brood patches were noted. Birds were ringed using a combination of numbered metal and coloured plastic rings for individual identification during recapture.



Plate 12. Deployed mist net in Ramdevra EF enclosure (left); Plate 13. Captured Common babbler through mist netting in Ramdevra EF enclosure (right)

Mist netting was conducted in April (18th April-2nd May 2024) and December 2024 (11th-23rd December 2024). In summer, a total of 120 birds belonging to 13 species were captured and ringed in the Ramdevra EF enclosure. The most common species captured were common babbler, house sparrow, and white-eared bulbul (Plate 13). Other notable species included Eurasian wryneck, Sykes's warbler, and yellow-throated sparrow. In winter, mist netting was done in DNP, Sam, and Ramdevra. A total of 98 birds belonging to 20 species were captured and ringed. Of these, 39 individuals from 13 species were caught in DNP and Sam, and 61 individuals from 13 species were captured in Ramdevra. The most frequently captured species in DNP and Sam were greater short-toed lark and common babbler. Other notable species included yellow-crowned woodpecker and Siberian stonechat (Plate 14). In Ramdevra, the most frequently observed species were common babbler, red-vented bulbul, and white-eared bulbul. Additional mist netting sessions are needed to identify meaningful patterns. We also aim to capture a wider range of species, including migratory birds.



Plate 14. Some of captured and ringed birds in mist netting in DNP and Ramdevra, e.g., Black-headed bunting (A & D), Siberian stonechat (B), and Yellow-crowned woodpecker (C)

Meso-carnivores

A camera trapping exercise was carried out in the Sudasari ACD enclosure to estimate the population of GIB nest predators prior to their planned translocation. The DNP enclosure

was divided into multiple 500×500 m grids, with camera traps deployed in 29 of these grids. One camera was placed at the centroid of each selected grid. Stones and sticks marked with radium tape were positioned in front of the cameras to help determine the distance classes of animals captured in the images. The cameras remained deployed for 20 days (20th November-10th December 2024). Captured images were sorted by species using a custom automated workflow, *Anipredictor*, and the distance classes were manually tagged using Exif-Pro software ver 2.1. The encounter rates of predator species recorded are presented below (Figure 6). Further analysis for density estimation using camera trap-based distance sampling is currently underway.

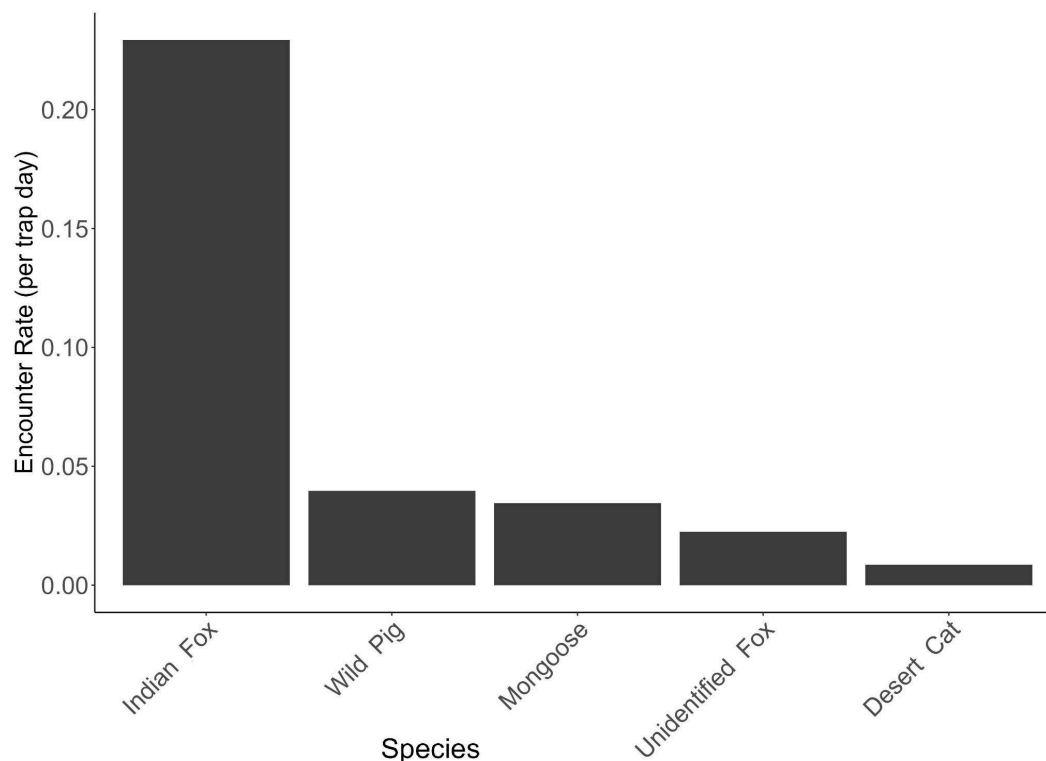


Figure 6. Encounter rates of nest predators in Sudasari ACD enclosure

Additionally, another session of camera trapping was conducted after the predator translocation. Camera traps were deployed in 19 grids within the Sudasari enclosure, following the same protocol as the previous session. The cameras remained active for 20 days (11th March-2nd April 2025). Photographs from this session are currently being processed for species segregation and will be used for further density estimation.

Threats Assessment and Mitigation Planning

Avian Mortality Monitoring under Power Lines in Priority GIB habitat

To address avian collisions with power lines in critical GIB habitats, three systematic surveys were conducted between June 2024 and January 2025 in the western Thar landscape, covering a total of 311.3 km: 141.5 km in June 2024, 55.5 km in September 2024, and 114.3 km in January 2025.

Surveys involved using a slow-moving vehicle, driving along power lines, and recording bird carcasses within a 30 m strip on either side. Each carcass was identified up to species or taxonomic group and classified into three size categories: small (<100 gm), medium (100–1000 gm) and large (>1000 gm). The presence of Bird Flight Diverters (BFDs) and their conditions were also recorded for the first four pylon spans of each line.



Plate 15. Team member collecting biological samples from a carcass under the power line during the survey (left); Plate 16. Multiple carcasses under a high-tension power line were recorded during the survey (right)

A total of 52 bird species were detected between June 2024 and March 2025, of which 13 were identified up to species level. Species included Cinereous vulture, Laggar falcon, Red-wattled lapwing, and Indian courser. Species with the highest mortalities were Egyptian vultures (6), Eurasian-collared doves (6), Tawny eagles (2), and Griffon vultures (2). While, size-wise, large carcasses were detected the most ($n=26$) followed by medium ($n=2$) and small ($n=5$).

Mortality estimates will be refined using correction factors for detection probability and carcass removal from Uddin et al. (2021). These findings reflect the ongoing threat of power lines to avifauna in the Thar and emphasise the need for implementation of directed mitigations to safeguard birds associated with GIB.

Technical support in the management of GIB areas

Predator Removal from Key GIB Enclosures

In December 2024, a targeted predator translocation exercise was conducted within the Sudasari ACD enclosure. Before the capture operations, a detailed reconnaissance survey was undertaken to identify active predator zones. Based on these observations, padded foothold traps were strategically deployed at sites exhibiting signs of predator activity. Baits comprising animal entrails and poultry parts with feathers were used to enhance trap effectiveness.

Traps were inspected at two-hour intervals to minimise stress and ensure humane handling of captured individuals. Immobilisation of captured predators was achieved using a

standardised protocol involving a combination of xylazine and ketamine, with continuous monitoring of vital physiological parameters throughout the procedure.

Upon immobilisation, each individual was fitted with a colour-coded collar for identification. Morphometric data, including body measurements and weights, were recorded, and biological samples, such as hair and ectoparasites, were collected for future health and genetic assessments. All translocated individuals were released within 24 hours at pre-identified release sites located 35–90 km away from GIB breeding enclosures. Release locations were selected based on the availability of suitable habitats for foxes to maximise post-release survival and minimise the likelihood of homing behaviour while ensuring non-overlap with bustard breeding grounds. In total, two desert cats and four desert foxes were translocated since July 2024.

Dog Sterilisation in Villages surrounding GIB Habitats

WII, in collaboration with Gramodaya Samajik Sansthan and ASRA Animal Welfare Organisation, implemented a comprehensive dog population sterilisation impact assessment across ten villages surrounding critical Great Indian Bustard habitats in Ramdevra. This initiative formed part of an Animal Birth Control (ABC) and Rabies Vaccination Program aimed at mitigating threats from free-ranging dogs, which pose significant risks to wildlife through direct predation, fear-mediated behavioural changes, competition, disease transmission, and hybridisation. The surveys provided baseline information on dog population sizes and sterilisation coverage, facilitating the evaluation of ongoing conservation interventions to safeguard this critically endangered species.

Dog capturing, handling, and sterilisation operations were carried out by the ASRA Animal Welfare Organisation. Capture methods prioritised humane handling, employing the least invasive techniques possible. Experienced street dog catchers vaccinated against rabies were deployed for all field operations.

Before initiating dog capture, escape-proof holding cages were constructed at the operational field site. These enclosures, built with brick walls and concrete floors, were equipped with continuous access to fresh water and ceiling fans to maintain animal welfare (Plates 17 & 18).



Plate 17. Dog cages used while neutering free-ranging dogs in Ramdevra, Jaisalmer (left); Plate 18. Dog-catching involving hoops with net method (right)

Following infrastructure preparation, dog capture activities commenced using three primary methods tailored to the behaviour and distribution of dogs. Hand-catching was employed in

areas where dogs were sociable and allowed for non-stressful manual capture. For more aggressive or wary individuals, particularly in densely populated urban areas, dog-catching hoops equipped with large and deep polypropylene nets (5 feet deep, 2.5 feet in diameter) attached to long handles were used (Plate 18). This method enabled safe and efficient transfer of dogs to the caching vans. The more elusive and feral dogs, typically found in open or minimally human-inhabited areas, were captured using dart guns.



Plate 19. Dog transferred to the catching van (left); Plate 20. Unique dog ID label on the net (right)

Once captured, each dog was transferred to a caching van (Plate 19), and containment nets were tagged with unique individual identifiers (Plate 20) to ensure accurate tracking throughout the sterilisation process. A fully equipped surgical operation unit was established prior to sterilisation. The facility included a separate sterile storage area for surgical instruments, medicines, and consumables such as gloves, masks, caps, and gowns. A 20-litre autoclave enabled the sterilisation of up to ten surgical sets simultaneously. The operation theatre was furnished with a surgical table, lights, intravenous stands, scrub sinks, and emergency kits to meet medical contingencies. Each dog underwent a health assessment before surgery to confirm eligibility, ensuring animals were above six months of age, not pregnant, and free from evident disease. Fit dogs were sterilised, and a left ear notch was administered for post-operation identification. Post-surgery, dogs were monitored for up to four days to ensure recovery before being released back at their respective capture sites (Plate 21).

The sterilisation drive was initiated after the preparation of dog kennels at the "Shree Baba Ramdev Nandisala" facility at Ramdevra. Capture operations began on 10th July 2024 and concluded on 4th August 2024. A total of ten villages were selected based on their proximity to protected enclosures and frequent Great Indian Bustard movement.

During the campaign, a total of 560 dogs were sterilised across the ten villages. Of these, 57% (N=317) were males and 43% (N=243) were females (Fig. 7). The highest number of dogs (30%, N=165) were captured from Ramdevra (Fig. 7). In contrast, capture efforts in Khetolai were unsuccessful due to the open landscape, which made dog capture infeasible (Fig. 7).



Plate 21. Dog release in the capture sites after sterilisation process

Following the sterilisation program, a postoperative dog population survey was undertaken to evaluate the effectiveness of the intervention by estimating the proportion of sterilised versus non-sterilised dogs. The proportion of non-operated dogs varied across villages, with the highest observed in Eka (53%, N=10), followed by Chacha (29%, N=14), and Ramdevra (22%, N=46) (Fig. 8). Other villages reported lower proportions of non-operated individuals - Bhadriya (20%, N=16), Dholiya (16%, N=7), Gomat (14%, N=11), Veeramdeora (8%, N=7), Brijpor (8%, N=5), and Loharki (5%, N=3) (Fig. 8). These findings highlight areas where further intensification of sterilisation efforts is required to enhance the effectiveness of dog management measures in critical GIB habitats.

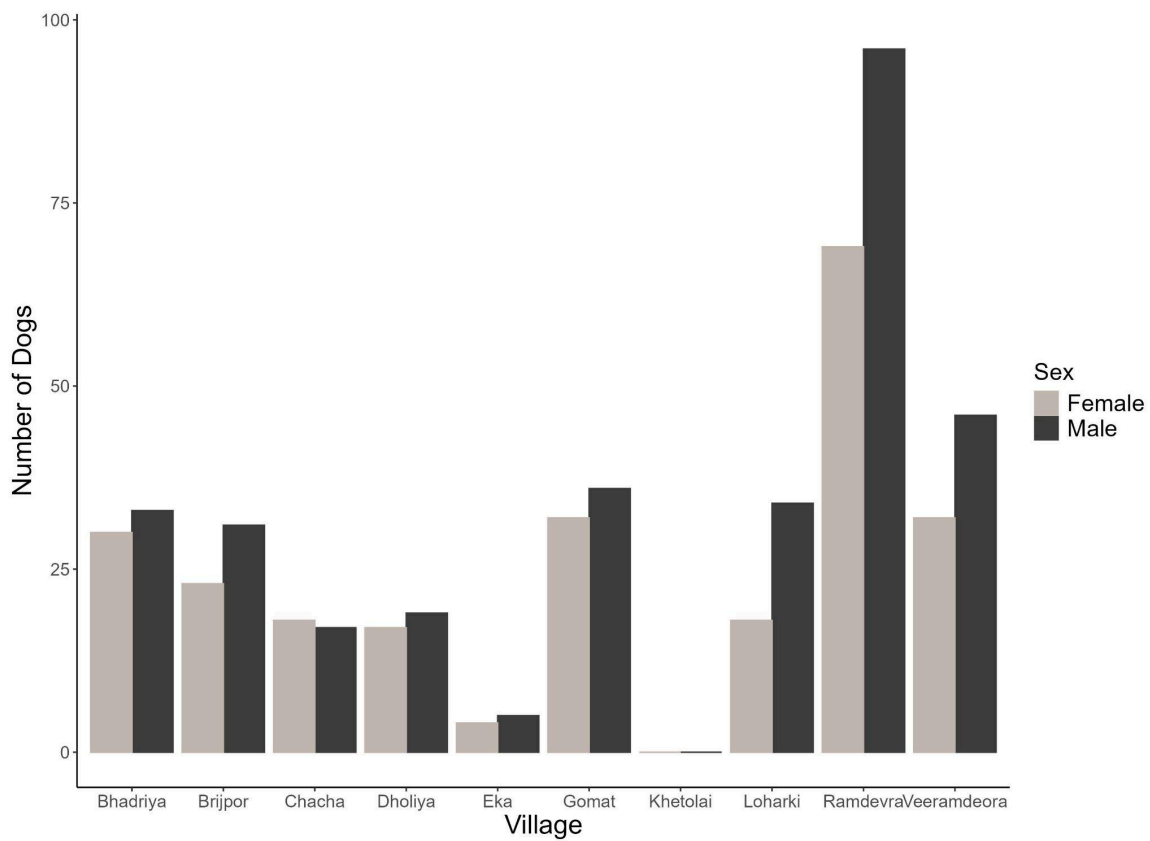


Figure 7. Number of free-ranging dogs per village in and around Ramdevra, Jaisalmer during July-August 2024

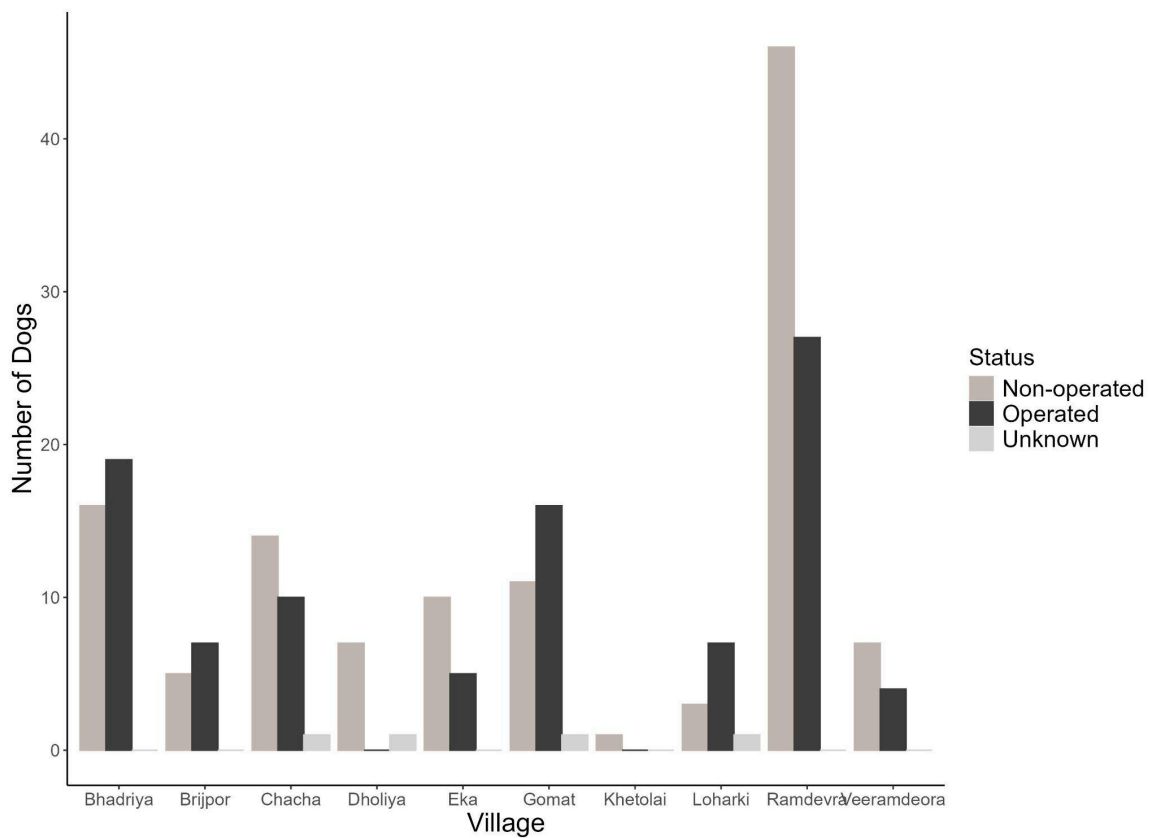


Figure 8. Proportion of neutering success by comparing operated and non-operated dogs per village in and around Ramdevra, Jaisalmer during 2024

Genetics

Standardisation of GIB Microsatellites and Generation of Genotyping Data

A total of 27 GIB-specific microsatellites were selected from the whole genome data. The microsats were selected because they were found to be polymorphic in five individuals and were on different chromosomes to avoid linkage. Of these, 22 were standardised in the Molecular Ecology and Conservation Genomics lab at WII. Genotyping data for 47 individuals (37 captive and 10 wild) have been generated using 17 markers. Allele frequency analysis, which involves identifying and counting alleles at each locus within a genotype file to estimate their frequency in the population, was conducted using the genotyped data from CERVUS. The corresponding summary statistics for each locus are provided below (Table 4). Analysis to estimate the relatedness between individuals is currently underway.

- Number of individuals: 47
- Number of loci: 17
- Mean number of alleles per locus: 4.412
- Mean proportion of loci typed: 0.8335
- Mean expected heterozygosity: 0.5698
- Mean polymorphic information content (PIC): 0.5054
- Combined non-exclusion probability (identity): 1.192×10^{-11}
- Combined non-exclusion probability (sib identity): 0.00001773

Table 4. Summary statistics for each locus based on allele frequency analysis

Locus	k	N	HObs	HExp	PIC	NE-1P	NE-2P	NE-PP	NE-I	NE-SI	HW	F(Null)
Mic-12	3	40	0.575	0.576	0.506	0.838	0.694	0.542	0.248	0.528	NS	-0.0173
Mic-06	7	44	0.659	0.74	0.699	0.661	0.478	0.281	0.104	0.41	NS	0.0675
Mic-19	7	42	0.738	0.74	0.707	0.648	0.461	0.255	0.097	0.408	NS	-0.0041
Mic-03	5	41	0.463	0.716	0.67	0.697	0.516	0.323	0.123	0.427	NS	0.2056
Mic-17	3	45	0.422	0.471	0.367	0.891	0.811	0.711	0.384	0.613	NS	0.0543
Mic-08	4	45	0.111	0.335	0.295	0.945	0.84	0.734	0.483	0.705	ND	0.5144
Mic-07	3	41	0.488	0.501	0.412	0.878	0.772	0.65	0.338	0.587	NS	0.0135
Mic-33	2	29	1	0.509	0.375	0.875	0.813	0.719	0.375	0.594	***	-0.333
Mic-14	6	43	0.744	0.796	0.755	0.593	0.414	0.23	0.077	0.376	ND	0.0225
Mic-13	3	25	0.32	0.607	0.51	0.823	0.696	0.554	0.249	0.515	NS	0.3025
Mic-04	3	39	0.462	0.417	0.337	0.915	0.826	0.727	0.421	0.649	ND	-0.0613
Mic-21	5	46	0.217	0.241	0.231	0.97	0.87	0.764	0.588	0.778	ND	0.0285
Mic-02	6	40	0.55	0.564	0.526	0.823	0.65	0.459	0.227	0.528	NS	0.019
Mic-01	3	39	0.615	0.546	0.467	0.854	0.727	0.586	0.285	0.551	NS	-0.064

Mic-26	6	31	0.645	0.719	0.677	0.686	0.5	0.297	0.116	0.425	NS	0.0703
Mic-10	3	44	0.545	0.52	0.412	0.868	0.777	0.662	0.338	0.578	NS	-0.0312
Mic-22	6	32	0.625	0.688	0.644	0.722	0.538	0.337	0.137	0.446	NS	0.038

Species Identification of Power Line Mortality Samples

Feather samples were collected from carcasses detected during power line mortality surveys conducted in March, June, and September 2024. 70 feather samples were sent for species identification to the Molecular Ecology and Conservation Genetics Lab at WII. DNA was extracted from these samples using the DNeasy Blood and Tissue Kit, and the presence of DNA in the extract was checked by running a 0.8% agarose gel. The mitochondrial *Cyt-b* region was amplified using a universal primer and Sanger sequenced. The sequences were then blasted on NCBI to find the closest species matches. Of the 70 feather samples, 32 sequenced samples could be identified up to the species level (Table 5).

Table 5. Species identification of 32 avian feather samples based on mitochondrial Cyt-b sequencing, collected during the power line mortality surveys in 2024

Family	Species name	No. of individuals of each species
Columbidae	Rock pigeon	5
	Eurasian collared dove	6
	Spotted dove	1
Accipitridae	Steppe eagle	4
	Eurasian griffon vulture	1
	Shikra	1
	Egyptian vulture	8
Phasianidae	Indian peafowl	1
	Grey francolin	1
Motacillidae	Tawny Pipit	1
Corvidae	Large billed crow	1
Charadriidae	Lapwing sp.	1
Threskiornithidae	Ibis sp.	1

Technical Inputs to Other Range States

Maharashtra

The project team conducted field visits across grassland habitats in and around Pune, Solapur, and Ahilyanagar (Ahmednagar) especially in areas surrounding the Maldhok Bustard Sanctuary in Maharashtra (Plate 22). Key sites included Nannaj, Mohol, Karmala, Karjat, Mirajgaon, and Srigonda ranges of the Maharashtra GIB Sanctuary (Pune Wildlife Division) and Dhawalpuri and Ghazadipur in Ahilyanagar Territorial Division. The team assessed habitat status, observed the spread of invasive species such as *Lantana camara*, *Parthenium hysterophorus*, *Prosopis juliflora*, *Gliricidia sepium*, and *Hyptis suaveolens*; native weedy species such as *Acacia leucophlea*, *Azadirachta indica*, etc. and checked the restoration potential of existing grassland patches. A sensitization workshop was conducted for ~30 frontline staff of the Karjat, Mirajgaon, and Srigonda ranges of the sanctuary, where

challenges and opportunities in managing grassland ecosystems and potential actions for GIB conservation were discussed. The team also held meetings with officials (CCF, DCF, ACF, and RFOs) to explore future collaboration for grassland restoration and effective GIB habitat management.



Plate 22. Grassland in Bustard Wildlife Sanctuary in Solapur

Andhra Pradesh

A visit was made to the Rollapadu WLS, Andhra Pradesh to assess the status of habitat for GIB and lesser florican. Meetings were held with the Field Director Nagarajunasagar Srisailem Tiger Reserve, Deputy Director Atmakur Range and RFO Rollapadu WLS, to understand the on-ground challenges in managing the sanctuary. Areas around the sanctuary were visited, and technical inputs were provided in terms of the installation of BFDs on power lines passing in close vicinity of the sanctuary. It was noted that the Rollapadu WLS has potential to act as a release site for captive-bred GIB in the future and has a breeding Lesser Florican population that can be conserved *in-situ*.

Lesser Florican

In parallel to the above efforts, conservation actions for the lesser florican were ongoing during the reporting period. Monitoring activities focused on breeding habitats in the Ajmer region, aiming to understand current space use within the agro-pastoral landscape, document threats, and assess breeding success. Field-based monitoring of active nests and chicks was carried out to estimate field nest survival rates. Additionally, two males were

tagged and tracked across breeding (Ajmer Rajasthan) and non-breeding areas (Maharashtra, Karnataka, Uttar Pradesh, and Bihar), providing critical insights into seasonal movement patterns.

To mitigate the risks posed by intensive agricultural practices, particularly nest failure and bird mortality due to mechanised harvesting, a pilot nest protection program was implemented. Two nests were safeguarded by incentivising agricultural landowners to delay crop harvesting in fields surrounding active nests during the breeding season, successfully leading to the recruitment of two fledglings.

A lesser florican conservation plan, focusing on habitat restoration around key lekking sites in Ajmer was developed and submitted to the Rajasthan Forest Department for implementation, with technical assistance from WII.

Outreach and community engagement efforts are ongoing, including school-based awareness programs, *panchayat*-level meetings, and the establishment of information stalls during the local fair in Shokaliya landscape, to promote community support for lesser florican conservation.

Applied Research

Telemetry & Ranging

Two active leks of the lesser florican in Dhantol and Bhuri Nadi were selected for tagging during the breeding season in 2024. Lek monitoring was carried out in July and August 2024, and in September 2024; one male from each lek was trapped and fitted with Ornitela E10 GPS tags using a Teflon harness (Plate 23). The birds were released at the site of capture. Both males continued displaying at the site of capture for the rest of the breeding season. In October 2024, one of the birds was found dead in a harvested jowar field in Bhilwara district. The cause of death could not be ascertained, and the location of mortality was approximately 100 km from the tagging site. The other male remained at the breeding lek till early November 2024, and then started its southward migration. It has covered around 600 km and reached its wintering site in the Nandurbar district of Maharashtra by the third week of November. The bird was ground-tracked at the wintering site, and habitat sampling was conducted to understand habitat use and preference (Plate 24).



Plate 23. Releasing the male lesser florican after radiotagging in Dhantol lek, Ajmer during September 2024



Plate 24. The field team conducting habitat sampling at tagged lesser florican occupied sites in Dondaicha, Maharashtra during December 2024 (left) and February 2025 (right)

Habitat Use

The lesser florican is a grassland-dependent species that currently breeds in sub-optimal agricultural habitats of Ajmer district due to the loss of grasslands in this region. The scarcity of functional grasslands has compelled the species to now live in croplands having similar vegetation structure, particularly fields of *Jowar* (*Sorghum bicolor*), *Moong* (*Vigna radiata*), *Til* (*Sesamum indicum*), and *Urad* (*Vigna mungo*). Often, these agricultural sites chosen by lesser floricans are flanked by degraded scrublands and *charagahs* (grazing lands). Floricans typically require a structurally heterogeneous vegetation matrix, comprising both short (<50 cm) and tall (>50 cm) vegetation during the breeding period, and cultivated croplands of *jowar* and *moong* provide a suitable surrogate habitat during the breeding season. Males are frequently observed displaying in *jowar* fields during early breeding

phases, until plant heights exceed optimal thresholds (~50–80 cm), after which display activity shifts to *moong* fields where vegetation remains low and more uniform. Field observations suggest that floricans prefer crop fields with high natural grass density and limited agricultural disturbance, particularly in areas with minimal tillage where native herbaceous growth is retained. However, reliance on cultivated fields exposes floricans to several threats, significantly affecting their breeding success and survival.

Threat Assessment

Mortality from Mechanised Farming and Ground Disturbance

Mechanised farming and human activity pose severe challenges to the breeding success of the lesser florican. The use of harvesters and tractors during peak nesting months often leads to fatal encounters with nests and chicks. On September 22nd, 2024, a 3–4-week-old chick was found dead in a *urad* field in Bandanwara, which was found trampled near the tyre track of a harvester (Plate 25). In late August, a female with two chicks had been seen in the same area (Plate 26). In addition to mortalities caused by agricultural machinery, florican nests, often hidden in thick vegetation, are accidentally destroyed by livestock grazing and people walking through these shared areas (Plate 27). Extensive use of grasslands and adjoining croplands by livestock, pastoralists, and villagers significantly increases the risk of unintentional nest trampling.



Plate 25. The remains of a lesser florican chick that died due to a harvester (left); Plate 26. A lesser florican chick trampled by a harvester in September 2024 (middle); Plate 27. Trampled eggs of lesser florican found in a crop field in Kalyanpura, Ajmer, during monsoon 2022 (right)

Predation in Croplands

Florican nests, chicks, and adults face significant predation pressure in agricultural landscapes. Known predators include free-ranging dogs, foxes, jackals, snakes, monitor lizards, and mongooses. The density and movement of dogs in agricultural areas is notably high, often leading to negative interactions with displaying males. In multiple instances, male floricans have been observed abandoning or shifting their lekking sites due to repeated disturbance by free-ranging dogs (Plate 28). While quantitative information on nest and chick predation rates is currently lacking, anecdotal evidence suggests that free-ranging dogs pose a major and under-assessed threat to breeding success through disturbances and possibly predation.



Plate 28. A free-ranging dog chasing a breeding male lesser florican in Kalyanpura lek in Ajmer during August 2024 (left); Plate 29. A male lesser florican injured after collision with a high-tension power line near Shokliya during July 2023 (right)

Collision with Overhead Power Lines

Mortality of adult birds due to collision with overhead power lines has been recorded in multiple instances. Notably, a satellite-tagged female florican, tagged in Gujarat by the Gujarat State Forest Department, was found dead in Maharashtra in 2022 after colliding with a 33 kV line (Ram et al. 2022). Similarly, a male lesser florican was found fatally injured under a high-tension line near Shokaliya in July 2023 (Plate 29). Considering the risk posed by power lines, mitigation of power lines in restored habitats is necessary.

Cumulatively, these threats result in the loss of ~75% of eggs and contribute to high adult and chick mortality of this Critically Endangered species.

Technical support in habitat restoration

Removal of *Prosopis juliflora* & *Parthenium*

The breeding landscape of the lesser florican in Ajmer consists of agricultural fields interspersed with degraded grassland patches and village *charagahs*. Several of these grasslands historically supported breeding lesser florican populations, which are now severely degraded due to invasion by *Prosopis juliflora*. Most of these invaded lands are government-owned and fall under the administrative control of local *panchayats*, typically registered as village *charagahs*. Only a few patches lie within the jurisdiction of the Rajasthan Forest Department.

The Government of Rajasthan notified the Lesser Florican Conservation Reserve in forest lands located at Beed Arwar, Beed Goyla, Beed Athun Vazir Khan, and Beed Brij Mohandas Shivsingh Kheeriya, situated near Shokaliya in Nasirabad block of Ajmer district. The total area covered under this reserve is 931.007 ha (Plate 30). However, all these sites were infested with *Prosopis juliflora* at the time of declaration. Initial efforts by RFD to remove *P. juliflora* from Beed Arwar during 2019–20 showed short-term success, but it re-invaded within two years due to a lack of sustained management.



*Plate 30. Grassland plot of Arwar beed, where *Prosopis juliflora* and *Parthenium* removal activities were carried out*

Thus, a portion of *Beed* Arwar, approximately 40 hectares in size and demarcated by a road and boundary wall, was selected for renewed intervention in March 2024. This effort was led by the RFD with logistical support from the Bustard Recovery Program. At this site, *P. juliflora* was first removed mechanically using JCB machines, and secondary invasion of *Parthenium hysterophorus* was then uprooted using manual labour. This effort successfully suppressed the weeds and facilitated the regeneration of native grass species. The restored area is now showing encouraging signs of grassland recovery. This pilot effort will be scaled up to other areas in the upcoming years.

Florican Conservation Roadmap for Rajasthan

Based on the learnings from the past few years of lesser florican research, a conservation roadmap was submitted to the Rajasthan Forest Department. The key recommendations of this plan were as follows:

1. Restoration of grassland habitats
 - a. Restoration and management of forest lands through reinforcement of boundaries, removal of *Prosopis juliflora* and other weeds, complete restriction on plantation of woody species, reseedling or grass plantation where necessary, removal of threats such as free-ranging dogs, powerlines, increased patrolling, and regulation of grazing.
 - b. Restoration and maintenance of *panchayat* land and *charagahs* through fodder development activities.
2. Securing the breeding activity of birds through interventions in agricultural areas
 - a. Seasonal leasing of lands around historical leks to secure agricultural breeding sites during the monsoon. Ongoing research has also shown that females tend to nest within leks, roughly within 5-10 ha of a displaying male.

Thus, securing these lekking areas is crucial for protecting male display sites as well as nesting females and, subsequently, chicks. Lands around these lek sites can be leased through appropriate means and with the help of conservation agencies. These cultivated lands can be managed in a florican friendly manner by restricting agricultural activity and allowing regrowth of natural vegetation. This strategy will serve as an immediate solution for safeguarding the historical lek sites that fall within agricultural areas.

- b. Crop compensation in fields with florican nests to reduce threats posed by mechanical harvesting of crops. The farmer/owner of the field can be compensated for the standing crops, and the field can be left unharvested till the end of October so that females can raise their chicks successfully. After this period, harvesting can be done without machinery to minimize the risk of trampling.
3. Management of free-ranging dog populations around functional leks
4. *Ex-situ* interventions
 - a. Securing birds for conservation breeding and continuing the ongoing National Lesser Florican conservation breeding program
 - b. Head-start program involving captive hatching and rearing of wild-laid eggs up to a certain point and their subsequent release into the wild when the chicks attain adult body weight.

Conservation Outreach

Grasslands in India, especially in arid and semi-arid zones, are fragmented, largely unprotected, and face increasing anthropogenic pressures. As the GIB depends on these vulnerable habitats, conservation efforts must engage local communities to ensure long-term success. To build local awareness, targeted outreach programs were conducted in DNP and other key GIB habitats. These initiatives aim to raise awareness about the ecological importance of grasslands and the endangered status of GIB. Activities include village meetings, school programs, and stakeholder interactions. These efforts help in reducing threats such as overgrazing and habitat disturbance. Collaborative actions among government agencies, NGOs, and communities remain central to sustaining these outreach efforts and protecting arid biodiversity. Nature education programs were conducted in schools around DNP and the Pokhran region to foster greater community support for Bustard conservation efforts. Trainees from different line agencies (particularly Forest Departments) were sensitised about GIB conservation through presentations and training during their visit to the GIB conservation breeding centres. Other dignitaries visiting the conservation breeding centres were also briefed about the progress of GIB conservation.

Training of Forest Department Frontline Staff

A total of 743 forest department personnel, including IFS officers, ACFs, RFOs, and Forest Guards were trained through targeted sessions (Table 6). The training modules focused on the ecology, behaviour, and conservation strategies for GIB, with practical demonstrations of field monitoring techniques and habitat management practices. Additionally, trainees from the Indian Institute of Forest Management were oriented to the ongoing conservation efforts under the project to build awareness and inspire future stewardship. These trainings have significantly strengthened ground-level understanding and capacity for species recovery and habitat protection.

Table 6. Record of Forest Department trainees sensitised on GIB and Grassland Conservation (2024–2025)

Date	Institute/Organisation of trainees	Number of trainees	Venue
08.03.2025	Maharashtra FD	21	Rehekuri, Mirajgaon and Shrigonda range in the GIB Sanctuary
06-07.03.2025	Maharashtra FD	8	Nannaj range
07.01.2025	IIFM, Bhopal	10	Sudasari
25.12.2024	Forest Guard	40	SAM CBC
21.12.2024	Forest guards	40	Ramdevra CBC
19.12.2024	Forest guards	30	B Forest Chowki
16.12.2024	Forest Guard	40	SAM CBC
11.12.2024	Forest guards	46	Ramdevra CBC
01.12.2024	Forest Guard	40	SAM CBC
12.11.2024	SFS Induction course, CASFOS, Dehradun	40	Sudasari
08.11.2024	Central Academy for State Forest Service	28	LF CBC
26.09.2024	Forest Guard	40	SAM CBC

25.09.2024	Forest Guard	40	SAM CBC
16.09.2024	Forest Guard	40	SAM CBC
16.09.2024	Forest Guard	40	SAM CBC
08.09.2024	IFS	50	Sudasari
05.09.2024	Female Forest Guard	20	Sudasari
05.09.2024	Forest Guard	40	Sudasari
05.09.2024	Forest Guard	40	SAM CBC
01.09.2024	Female Forest Guard	40	SAM CBC
29.08.2024	IFS	50	Ramdevra CBC



Plate 31. Training and sensitisation of forest officials and frontline staff to understand the importance of grasslands and bustard conservation actions

Celebration of Environmental Events

Wildlife Week

Various interactive sessions have been conducted during wildlife week in the schools in and around DNP, enabling the children and local people to have a better understanding of the importance and significance of the desert ecosystem. As part of the Wildlife week 2024 celebration by Rajasthan Forest Department, students from different schools in Jaisalmer visited DNP (Plate 32).



Plate 32. Sensitisation program for school children during World Wildlife Week 2024

Van Mahotsav

An awareness stall on GIB and its ongoing conservation efforts was set up during the Van Mahotsav at Jaipur to inform and engage the public (Plate 33). The stall highlighted the importance of grassland ecosystems and showcased key milestones of the GIB Conservation Breeding Centre. Informative posters, outreach materials, and models were displayed to explain the conservation journey so far. The Hon'ble Chief Minister of Rajasthan visited the stall and acknowledged the significant work being done at the conservation breeding centre, and appreciated the collaborative efforts to protect and restore the GIB habitat.



Plate 33. DFO Jaisalmer representing project growth and achievements at Van Mahotsav 2024

Sensitisation of Dignitaries

Sensitisation was carried out on bustard conservation breeding and *in-situ* conservation efforts being undertaken by WII and RFD for delegates visiting the conservation breeding centre. Some of the key people sensitised over the last year include the Forest Minister of Rajasthan, the District Magistrate of Jaisalmer, and Superintendent of Police of Jaisalmer, Indian Army officers, IFS trainees, and various media agencies.

Digital Outreach and Social Media Engagement

The project's Instagram account (@bustardrecoveryprogram) is responsible for designing and sharing informative social media posts to raise awareness about GIB, its habitat, associated species, and broader conservation efforts (Plate 34). The page also showcases updates from conservation breeding, field, community engagement, and conservation milestones to reach a wider audience.

A high-quality video documentary on GIB and project activities is being developed in collaboration with The Grasslands Trust and Telescope Pictures.

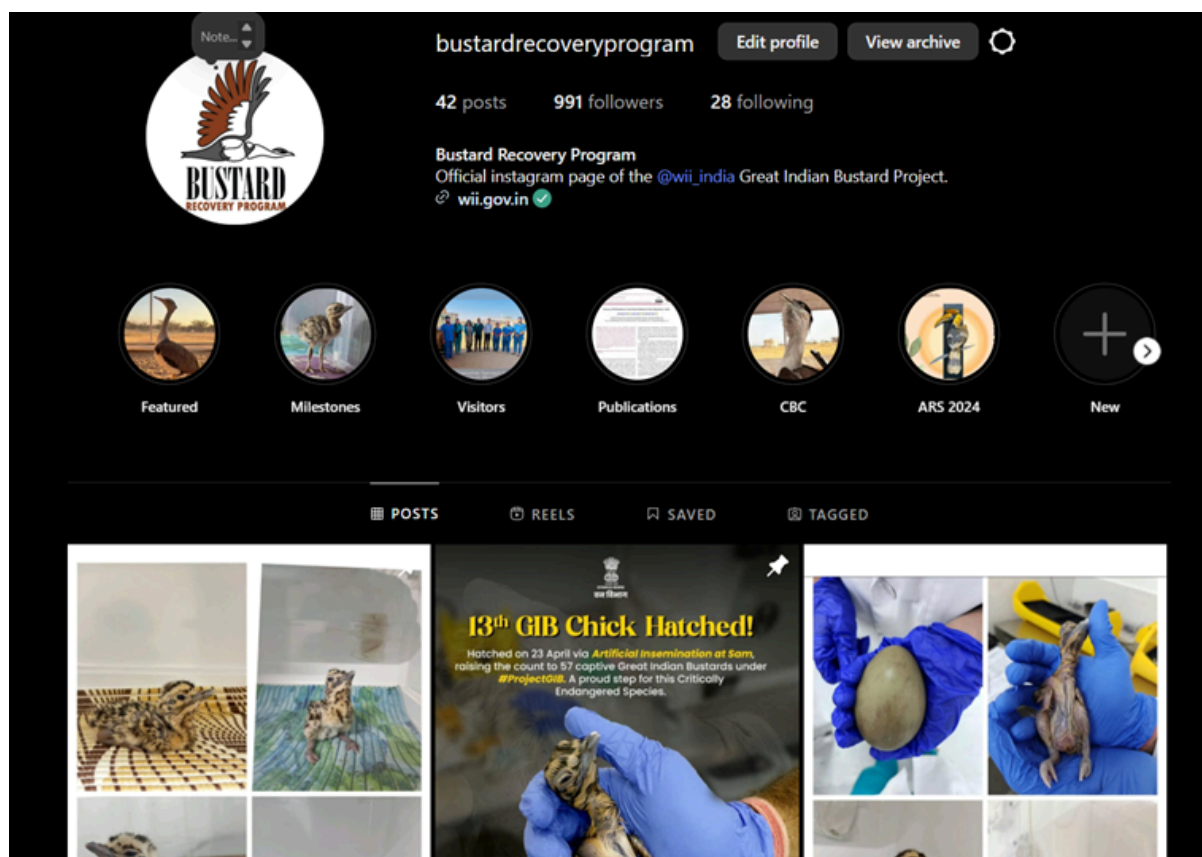


Plate 34. Homepage of the project's Instagram profile

Awareness among locals in the Florican landscape



Plate 35. Awareness stall on lesser florican and grassland conservation organised in a local fair in Jawal, Shokaliya in Ajmer

Awareness programs on the lesser florican and its associated species were conducted in several schools and villages in the lesser florican landscape of Ajmer, Rajasthan, and Bidar, Karnataka. Approximately 400 students and 700 villagers were sensitised. Additionally, a local fair in Jawla village near Shokaliya was used as a platform for mass outreach, where a

dedicated stall highlighting the ecological importance of the lesser florican was also set up (Plate 35).

As part of these efforts, informational boards on the lesser florican were installed at the entrances of five schools, namely, Sarana, Shokliya, Kalyanipura, Dhantol, and Bandanwara, located within the Ajmer landscape. Educational materials, including posters, bags, caps, notebooks, bookmarks, and badges featuring information on the species, were distributed during school and village-level outreach events.

Awareness programs on lesser florican and its associated species have also been conducted in a school in Bidar, Karnataka, where the bird winters.



Plate 36. Awareness program on lesser florican and its associated species conducted in a school in Bidar, Karnataka (left); Plate 37. Signage with awareness information on lesser florican installed in the lesser florican landscape in Ajmer (right)

Way forward

To strengthen ongoing conservation efforts for the GIB and the lesser florican, the following actions are proposed to be conducted:

- Scaling up the conservation breeding for GIB with parallel attempts for lesser floricans is critical for securing viable populations.
- Rewilding training for captive-bred GIB individuals will be undertaken to enable pilot release in restored habitats in Rajasthan.
- Captive-reared lesser floricans will be released in secured and restored habitats to support wild population recovery.
- Radiotagging of GIB individuals will be done to enhance our understanding of movement ecology, habitat use, and post-release survival.
- Population surveys for GIB and lesser florican (if feasible) need to be done to monitor demographic trends, habitat and threat assessment, and evaluate conservation outcomes.
- Efficacy assessment of threat mitigation measures will be conducted.
- Long-term targeted translocation of nest predators and sterilisation of free-ranging dogs in and around bustard habitats will be carried out to reduce predation pressures on nests.
- Ecological monitoring will be initiated to understand biodiversity recovery in restored habitats.
- Pilot-scale development of a grassland nursery will be initiated to support habitat restoration of degraded or invasive plant-dominated areas across the GIB landscape.
- Restoration of key LF habitats through removal of invasive plants and fencing of *charagah* will be done through active engagement of local communities and the Rajasthan Forest Department.

