

PROPOSAL FOR THE DECLARATION OF A
GREAT INDIAN BUSTARD SANCTUARY
IN KUCHCH

By
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Introduction

The great Indian bustard *Ardeotis nigriceps* is currently an endangered species of India. A bird of the open grasslands, its precarious situation has largely been brought about by the extensive overgrazing that its habitat has been subjected to. In addition, hunting and to a lesser extent the spread of cultivation has made matters worse.

In Gujarat, bustards were common in the Kathiawar peninsula. They were present throughout Saurashtra, excepting the forests and hills of Gir, Girnar and Barda, and in certain suitable habitats flocks of 30 to 40 individuals could be frequently seen (Dharmakumarsinhji 1957). In Kuchch, the bustards were never as common as they were in Saurashtra but they were widely distributed in the Mandvi, Mundra, Abdasa and Lakhpat Talukas, and were also frequently seen in the Banni areas and in suitable habitat bordering the Rann (Himmatsinhji, pers. comm.).

Several authors have documented the decline in the great Indian bustard populations in Gujarat (Ali 1945, Dharmakumarsinhji 1978, Sinha 1980, Rahmani and Manakadan 1988). Surveys by the BNHS in Gujarat revealed that the situation has deteriorated drastically and in three surveys undertaken between 1982 and 1985 only six great Indian Bustards were seen in 1984. Of this, five birds, (four females and a juvenile male) were seen near Bhatiya in Jamnagar district and a solitary male bustard was sighted in Mandvi Taluka in Kuchch (Ali et al 1985).

In 1989 a detailed survey of Saurashtra and Kuchch was conducted between 24th August and 30th September in order to find out the current status of the lesser florican *Sypheotides indica*. The details of that study will be published separately. During the survey some exciting new information was collected on the

great Indian bustard which showed that the birds still survive in Gujarat albeit in isolated pockets and in small numbers.

Currently the bustards probably breed only in Jamnagar and Kuchch districts and may occur in Bhavnagar, Surendranagar and Rajkot during nomadic movements or as vagrants. The Gujarat Forest Department has already declared one area as a great Indian bustard Sanctuary in Jamnagar District. The aim of this report is to highlight another area in Naliya Taluka in Kuchch district, which is currently the most promising area for the conservation of bustards in Gujarat. The proposed Jakhau bustard Sanctuary has the potential to become one of the finest bustard sanctuaries in India.

Results

Ghagha Bustard Sanctuary, near Bhatiya, Jamnagar district

This bustard sanctuary which consists of a single three hundred hectare plot was visited on 12 September 1989. One Female bustard was seen within the plot. She was very wary and hid almost immediately, inspite of the vehicle being nearly 100 meters away. As bustards are usually not prone to such shy behaviour, there are two possible explanations. Firstly the female could have had a chick which would explain her wariness. Secondly it is possible that the bustards and wildlife are persecuted by people and this also would cause undue wariness.

Unfortunately, the plot is a sanctuary in name only as it has been severely overgrazed as have the surrounding areas. This can be easily rectified by employing one or two chowkidaars on a daily wage basis from the nearest village. Some monitoring by senior officials will help in inculcating interest in bustard conservation.

Jakhau Grasslands, Abdasa Taluka, Kuchch

The Jakhau grasslands were visited on the suggestion of Mr Jetwa Dy. CF, West Kuchch and Mr Chhabra, ACF, Narayan Sarovar Chinkara Sanctuary, as nests of both the great Indian bustard and the lesser florican had been recently located (see map).

One nest with one egg of the great Indian bustard was present, and three nests of the lesser florican were seen, one having 5 eggs, and the other 2 having 3 eggs each. All the florican nests had been successfully hatched but unfortunately it seemed that the bustard had abandoned the nest. This would most likely have been due to the disturbance caused by Maldhari boys who had in fact discovered the nest when the hen bustard threatened the cattle when they grazed close to the nest.

In addition to this we saw 3 female bustards, and one unsexed individual in flight. It was likely that the females were encumbered with nests or chicks, as they were all solitary and wary. The current population of great Indian bustard should be atleast between 6 and 10 ten birds and forms an excellent nucleus for a revival of this species in Kuchch.

Other wildlife included a high concentration of Chinkara *Gazella bennetti* (over 40 animals were seen in one drive), Common Indian Fox *Vulpes bengalensis*, Jackal *Canis aureus* and the Rufous-tailed Hare *Lepus nigricollis*. The wolf *Canis lupus* was said to be present.

This grassland region is present between Naliya town and extends upto Jakhau Port in the west and towards Kothara in the south-east (see map). It is not easy to estimate the actual size of this grassland but it is perhaps not less than 50 sq km. It belongs to the Revenue Department and is used as grazing lands by the inhabitants of villages like Dharad Bant, Bhudiya, Sindhodhi, Lala, Parjan, Vighabhar, Ranpar and Jasapar. The main economy of the populace is from animal husbandry and some marginal cultivation of *jowar*, *bajra* and *guahar* is done during good monsoons.

The entire region is extensively grazed. Livestock comprised mainly of sheep, goats and cattle. The dominant grasses are *Aristida* and *Cymbopogon* as all other palatable fodder species were grazed. As livestock graze on *Cymbopogon* only when the grass is dry and during scarcity periods, hence at the time of my visit there was standing grass that varied between 20 and 50 cm.

The habitat is ideally suited for the great Indian bustard, the Houbara bustard *Chlamydotis undulata* and the lesser

florican primarily due to the stands of *Cymbopogon*. It would perhaps not be untrue to say that the Jakhau grasslands are the single largest tract of flat arid grasslands with sufficient grass cover, present in the country. There appears to be no or very little hunting. The chief threat to both the great Indian bustard and the lesser florican in this region is from the extensive grazing that this area is subjected to. It is likely that nest and/or chicks are being destroyed by livestock trampling on them while grazing, or the females abandoning the nests due to disturbances by the graziers and livestock.

Jamanwala village (near Barendra), Lakpat Taluka, Kuchch

An adult male bustard was sighted near Jamanwala village near Barendra (see map). The area in which it was sighted falls under the Narayansarovar Chinkara Sanctuary. This is a new record from an area where bustards were thought to have disappeared from. An extensive search of nearby areas failed to reveal more bustards. Discussions with local Maldharis indicated that the bustards breed here. However more information would be needed before any conservation measures can be taken up.

Recommendations

The first step would be to declare the grassland area between Naliya, Jakhau Port and Kothara as a great Indian bustard sanctuary. It would also be a sanctuary for the lesser florican which breeds here during good monsoon years and for the numerous chinkara present.

The second and more important conservation step is the creation of four or five widely separated plots that will serve as bustard breeding plots. These plots should be not less than 250 hectares each. As the land belongs to the Revenue Department sufficient grassland area should be transferred to the Forest Department for this. Some of this land has already been transferred to the Forest department at Jakhau as compensation for the land that has been acquired from the Forest Department at the submergence sites of the Narmada Valley Project. Further such compensatory sites can be located at Jakhau and earmarked for development as bustard and florican breeding sites.

Three areas are suggested for immediate incorporation as plots.

1) Adjacent to Ranpar village and the sea a plot of 700 ha has been transferred to the Forest Department as compensation for the Narmada Project. Currently about 250 ha has been planted with *Prosopis* and about 450 ha is being used as free grazing land. As this area already belongs to the Forest Department it is suggested that this be developed as a bustard plot.

2) The most important area for development as a Bustard plot lies between the Dharad Bant village, Hijuvali Talavali and the Narmada compensatory plot. A male bustard is known to display here (Male bustards are site specific and will use the same area to display in every year) and hence this area is of utmost importance for the development of the sanctuary. Two female bustards most probably nested here in the monsoon of 1989. As much grassland as possible should be acquired in this area as it will form the core breeding area from which the bustards can spread into other plots.

3) The third area that could be earmarked for development as a bustard breeding plot is the region east of the Narmada compensatory plot. It was in this region that a bustard and a florican nest were found.

Additional areas can be developed as plots especially in the area around Parjan, Vighabhar and Jasapar villages and any other area in which displaying male bustards are located.

Management of the Plots

Management of grasslands for bustard is simple. Remarkable comebacks have been made in areas where grazing was prevented in plots during the breeding season and the birds were given protection from hunting. Striking examples of these are the Nanaj Bustard Sanctuary near Solapur, Maharashtra (population rise; 10-12 in 1981 to 45 in 1989), Karera Bustard Sanctuary, Shivpuri district, M.P., (population rise; 14 in 1982 to 25-30 in 1986), and the Rollapadu Bustard Sanctuary (population rise; 35

in 1984 to 50-60 in 1988). However the non-acquisition of land for development as bustard breeding plots has resulted in a decline in numbers as has happened in the Karera Bustard Sanctuary where the population has declined from 25-30 birds in 1986 to 8-10 birds in 1989.

The plots to be developed as bustard breeding areas should be fenced in with a two or three strand barbed wire fence. Within the plots grazing should be strictly prohibited during the Monsoon, i.e June to November. During the other months i.e. December to May grazing can be permitted, but only those livestock from the nearest village should be allowed and thus the number of animals grazing can be regulated. No planting of trees, what-so-ever species, they maybe should be undertaken in the bustard breeding plots.

Hence in actuality there is no conflict between bustard management and sound animal husbandry policies. What resentment the local villagers will have for the Bustard Project will disappear after one or two monsoons when the quality and quantity of fodder available to them during the lean period is greatly increased.

Currently the Forest Department is planting trees in the area. While the emphasis is on *Acacia*, *Prosopis* has been planted in several plots. The spread of *prosopis* will destroy the grasslands of Jakhau, and the last viable population of the Great Indian bustard in Gujarat will also vanish. It is urged that all planting of *Prosopis* be stopped and if necessary existing *Prosopis* plantations at Jakhau be destroyed and replaced with plantation of *Acacia*.

With the creation of a Great Indian Bustard Sanctuary and the development of 4 to 5 bustard breeding plots in the Jakhau grasslands, it is envisaged that the area will become one of the finest semi-arid grassland sanctuaries in India for not only the Bustard but also for the lesser florican and the chinkara.

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A STUDY ON THE DISTRIBUTION, DENSITY AND BEHAVIOUR
OF BUSTARDS IN TANZANIA

A Proposal for Research
by

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This proposal for research on bustards in Tanzania has two primary objectives. One is to describe in detail the breeding behaviour of the bustards. The other is to plan a long term conservation strategy based primarily on surveys and on an assessment of the problems currently facing individual species.

AN INTRODUCTION TO BUSTARDS

The family Otididae, commonly known as the bustards, is an ancient one, with the earliest fossil record from the Eocene period, 40-50 million years ago (Osborne *et al.* 1984). The bustards possibly originated in Africa, and the continent is probably the centre of their divergence. The present day distribution includes Africa, Europe, Asia and Australia (Bannerman 1931, Priest 1934, Ali and Ripley 1969, Cramp and Simmons 1980, Osborne *et al.* 1984, Collar *et al.* 1986).

The relationship between bustards and other Avian taxa is unclear, but most taxonomists now place the bustards in the Order Gruiformes (Ripley 1961, Ali and Ripley 1969, Cramp and Simmons 1980, Walters 1980, Osborne *et al.* 1984, Collar *et al.* 1986). However, certain anatomical peculiarities distinguish them sharply from other crane-like birds. These include hexagonal (rather than transverse) tarsal scales; the absence of an oil gland, the body being covered instead with a dense friable powder-down, and completely different egg-white proteins (Stressman 1959, Hendrickson 1969, Cramp and Simmons 1980). Some confusion still exists in the taxonomic classification within the family (Osborne *et al.* 1984). For instance, Howard and Moore (1980) classified the Otididae into 11 genera with 24 species and

44 subspecies. More recently, Osborne *et al.* (1984) divided them into 8 genera with 22 species and 47 subspecies.

Certain morphological characters distinguish the bustards from other Avian taxa. Bustards are medium to very large terrestrial birds, with males of the largest species close to the theoretical maximum weight for flying birds (Osborne *et al.* 1984). Their flight is powerful, with sustained wing beats, and they glide only while descending to land. The wings are long and broad, with 10 primary flight feathers and 16-24 secondaries. The tails are of short to medium length, broad and either square-tipped or slightly rounded. Bustards have long necks, with a stout body carried horizontally on long legs. The bills are straight, broader at the base and compressed laterally at the tip. The toes are short with thick soles and broad claws, and the hind toe is absent. All bustards are cursorial and do not perch. There are no bare tracts on the neck, and the contour feathers have an aftershaft. The caeca is long and of distinctive form and the crop is absent. (Source - Cramp and Simmons 1980).

Though considerable general information on bustards is available in natural history literature, their ecology is still poorly known. Only seven species have been studied in detail. Those species that have been studied were found to be polygynous (Mendelsohn 1979, Cramp and Simmons 1980, Osborne *et al.* 1984, Schulz 1985, Ridley *et al.* 1985, White 1985, Collar *et al.* 1986, Caranza *et al.* 1989, Rahmani 1989, Narayan 1990, Sankaran 1991). The male courtship displays are spectacular. Larger bustard species display on the ground and most smaller species aerially. The males are conspicuously coloured, and the ornamentation includes crests, moustaches and elongated plumes on the neck and head. The larger species have the ability to puff up the subcutaneous tissue of the neck till it resembles an inflated balloon. Females are cryptically coloured, and usually smaller than males. This sexual size dimorphism is most pronounced in the larger species.

Most bustard species endemic to the African continent have not yet been studied in detail, so much so that even the breeding displays, perhaps the most fascinating aspect of their behaviour, have not been described for many species (Osborne et al. 1984). The available descriptions of the breeding behaviour of African bustards are brief and qualitative (e.g. Morgan-Davies 1965, Hellmich 1988, Tarboton 1989).

THE BUSTARDS OF TANZANIA

Eight species of bustards are known to occur in East Africa (Tanzania, Kenya and Uganda) either as residents, in passage or as vagrants (Britton 1980, Lewis and Pomeroy 1989). Of these, six species are resident in Tanzania (Baker 1989) and endemic to the African continent. These are Denham's Bustard *Neotis denhami*, Kori Bustard *Ardeotis kori*, Buff-crested Bustard *Eupodotis ruficrista*, White-bellied Bustard *Eupodotis senegalensis*, Black-bellied Bustard *Eupodotis melanogaster* and Hartlaub's Bustard *Eupodotis hartlaubii* (Baker 1989). A brief outline of distribution and status in Tanzania (excerpted from Baker 1989, Collar et al. 1986), preferred habitat and breeding behaviour (excerpted from Cramp and Simmons 1980, Osborne et al 1985, Collar et al. 1986) is given below for each of these species.

1) Denham's Bustard

Occurs in western Tanzania between 600 m and 3,000 m. Uncommon to rare. Habitats - grasslands, shrublands, light woodlands, farmlands, dried marshlands and arid scrub plains. Population status unknown but possibly threatened. Current breeding status in Tanzania unknown. Moves in response to rainfall. Laying dates March to July. Breeding behaviour poorly described. Mating system unclear, probably polygynous.

2) Kori Bustard

Occurs in north Tanzania. Common. Habitats - open grasslands

and dry, lightly wooded savannas. Population status unknown. Local migrations in response to rainfall, bush fires or Wildebeest *Connochaetes taurinus* migrations. Breeds in Tanzania. Laying dates January to April, June and November. Breeding displays described but not quantified. Mating system unclear, probably polygynous.

3) Buff-crested Bustard

Occurs in east-central Tanzania, ranging south from Kilimanjaro across the Maasai steppe to the lowlands of Iringa. Common. Habitats - arid or semi-arid savanna including thin bush, light woodland and scrub. Never found in completely open terrain. Population status unknown. Resident and breeding in Tanzania. Laying dates November and January (March to June in Kenya). Breeding displays described but not quantified. Mating system unclear, probably polygynous.

4) White-bellied Bustard

Occurs in east-central Tanzania. Two races are present. *Eupodotis senegalensis canicollis* occurs from Arusha and Kilimanjaro to Mpwapwa, while *E. s. erlangeri* appears to follow the eastern rift south through Dodoma to the Iringa lowlands and west to Tabora. Generally uncommon (?). Chiefly inhabits open grassland and savanna, but occurs in areas of bush, plains and cultivation. Population status unknown. Breeds in Tanzania. Laying dates January, February, April, May, October and November. Breeding behaviour poorly described. Mating system unclear but probably monogamous.

5) Black-bellied Bustard

Occurs throughout Tanzania from sea level to 2,500 m. Common. Habitats - tall grassland with or without trees and bushes, lightly wooded savanna, cultivation, pastures and fallow fields. Breeds in Tanzania. Laying dates January, May and

September (apparently prefers late dry season). Breeding displays

described. Mating system unclear, probably polygynous.

6) Hartlaub's Bustard

Occurs in northern Tanzania from Dodoma north to Arusha Chini. Uncommon. Habitats - short grass *Acacia* savanna, thin straggling bush in semi-desert and open, grassy plains. Breeds in Tanzania. Laying dates January and June (breeds during both rains). Breeding behaviour undescribed. Mating system unknown.

OBJECTIVES

- 1) To define precisely the present distribution of the six bustard species found in Tanzania.
- 2) To study the density of bustard populations in selected areas.
- 3) To investigate the extent of hunting and trapping of bustards.
- 4) To quantitatively describe the breeding biology of Denham's, Buff-crested, Hartlaub's, Black-bellied, White-bellied and Kori Bustards.
- 5) To prepare, on the basis of the data obtained, a conservation management plan for the bustards of Tanzania.

TENTATIVE METHODS

- 1) To define precisely the present distribution of the six bustard species found in Tanzania.

Intensive road surveys of the country will be conducted, with special emphasis on those species which have limited distributions within the country. The country will be divided into a series of grids, either based on habitats or on

coordinates. Each grid will be thoroughly surveyed by road, and at randomly selected locations on foot. Data thus collected will

be based on direct sight records. Additional information will be gathered through interviews. An attempt will be made to cover those areas of particular importance at least once in each season. During the surveys, relative density of the bustard species will be studied through road counts.

Data collected during surveys will include the following.

- 1) Date
 - 2) Time of day
 - 3) Weather and climatic conditions
 - 4) Species seen with numbers of males, females and immatures
 - 5) Location (co-ordinates) with reference to district and nearest town and/or village
 - 6) Activity of bustards (display, nesting, foraging etc.)
 - 7) Breeding status in the area
 - 8) Status of habitat (a) Protected (b) Unprotected
 - 9) Primary pattern of land use if unprotected
 - 10) Livestock population in the area/district; extent of grazing
 - 11) Human population in the area/district; extent of agriculture
- (10 & 11 from official sources)

Habitat characteristics at each location of sighting will be classified as:

- 1) Soil - a) sandy b) rocky c) loamy d) clay
 - 2) Topography - a) flat b) undulating c) hilly
 - 3) Vegetation - a) bare b) open grassland c) grassland with trees d) grassland and scrub e) scrub f) lightly wooded g) crop fields and kind of crop i) fallow fields (j) grazing land
- Interviews at villages, particularly in hunting or pastoral communities.

- 2) To study the density of populations in certain important bustard areas.

Standard census techniques like open-width or closed-width transects will be used in selected bustard areas. Prime areas for each of the six resident species will be studied. Transects will be laid in the different habitat types that the individual species are known to use. Some preliminary transects will be laid for each species so as to refine techniques and methods. The transect length and width will vary for the individual species; larger species will have longer transects. These will be duplicated in adjoining unprotected areas. An attempt will be made to study the density of the bustard species in all the seasons. Standard vegetation study techniques will be used to quantify habitat characteristics in each transect.

- 3) To investigate the extent of hunting and trapping of bustards.

Hunting communities as well as bird traders will be interviewed to assess the extent of trade in bustards.

- 4) To quantitatively describe the breeding behaviour of Denham's, Buff-crested, Hartlaub's, Black-bellied, White-bellied and Kori Bustards.

This study involves intensive behavioural studies. Field stations will be set up at selected sites where the targeted species breed and are common. (These field stations will also be the base camps for the surveys and density studies). The studies will primarily follow Altmann's (1974) focal animal sampling method. Selected individuals will be observed over the daylight hours; colour marking for individual identification will also be

used where possible.

Data collected will focus on :

- 1) Description of the various displays including courtship displays and agonistic displays
- 2) Sound recordings of auditory signals produced during the displays
- 3) Location of display sites with reference to habitat and topography
- 4) Distances between displaying males
- 5) A thorough mapping of location and spacing patterns of displaying males in selected areas
- 6) Movement patterns within territories
- 7) Preferred weather conditions for display
- 8) Response of females to the various displays
- 9) Nest site with respect to location, topography and habitat
- 10) Nesting behaviour
- 11) Behaviour of the females with young

DURATION OF STUDY

3 Years

(2 years and 6 months in field work; 6 months for analysis and preparation of the report).

WORK PLAN

The first one and a half years will be spent in south-western Tanzania, where a field station will be set up at Ruaha to study the the breeding biology and the relative densities of the Buff-crested, White-bellied and Black-bellied Bustards. A field station to study the Denham's Bustard will be established once a breeding population is located. These field stations will also be used as the base from where the southern half of Tanzania will be surveyed to study the distribution of bustards in that

region.

In the subsequent one year, a field station will be established in north-eastern Tanzania, where the breeding biology and relative densities of the Hartlaub's and Kori Bustards will be studied. During this period, the northern half of Tanzania will be surveyed to determine distributions.

The last six months will be spent in the analysis of data and the preparation of the final report.

SUPPORT STAFF REQUIRED

Two field assistants employed for the entire duration of project. Casual labour on a temporary basis whenever necessary.

JUSTIFICATION

With 22% of Tanzania being protected from human use as wildlife reserves, some bustard species are as yet locally common. The status of the Denham's Bustard, however, is of some concern as it has become quite rare over most of its range in Tanzania, even in areas where it was common as recently as 20-25 years ago (Baker 1989). The Hartlaub's Bustard is a species about which very little is known. This species is probably under pressure as its favoured habitat, prime cattle country, is now being severely overgrazed. The other species, e.g. Black-bellied Bustard, have much wider distributions in Africa and are still locally common in areas. However, in the absence of any hard data, the trends in their populations are unknown.

According to Baker (1989), "Tanzania is undoubtedly of major importance for all six resident species. Countries to the north, west and south either suffer from extensive and intensive agriculture or have a less suitable environment for the bustards. With no figures to hand it is difficult to prove but it is likely that today Tanzania holds a significant percentage of African bustards. Furthermore, future pressures are likely to be higher in other countries so that this population will assume even

greater importance."

Grasslands and savanna, the bustards' primary habitat, are particularly vulnerable to grazing pressures by domestic livestock and/or conversion into farmlands. All countries, especially those with a growing agrarian or pastoral population, suffer increasing demands on natural resources. The consequent changes in land use have reduced habitat available to most animal species. The steady decline in bustard numbers throughout their range has been primarily due to a loss of habitat. This has been further aggravated by over exploitation through hunting and trapping.

For bustard conservation to be effective, measures must be initiated before large scale changes in land use and overall habitat degradation take place. India, for instance, has suffered on this account. Research on bustard ecology and conservation began only well after the three resident species were seriously threatened. The conservation efforts are in a sense last ditch efforts to save the species, with one, the Lesser Florican *Sypheotides indica*, possibly requiring captive breeding if it is to survive (Sankaran, in prep.).

Tanzania, however, still has not suffered from the extensive and intensive habitat destruction that India has undergone. The first step towards formulating a long term conservation strategy for the bustards in Tanzania is to study and understand their distribution, behaviour and requirements. For any such strategy to be successful, it is imperative that research is begun while the individual species are still relatively abundant.

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LIST OF REQUIRED EQUIPMENT